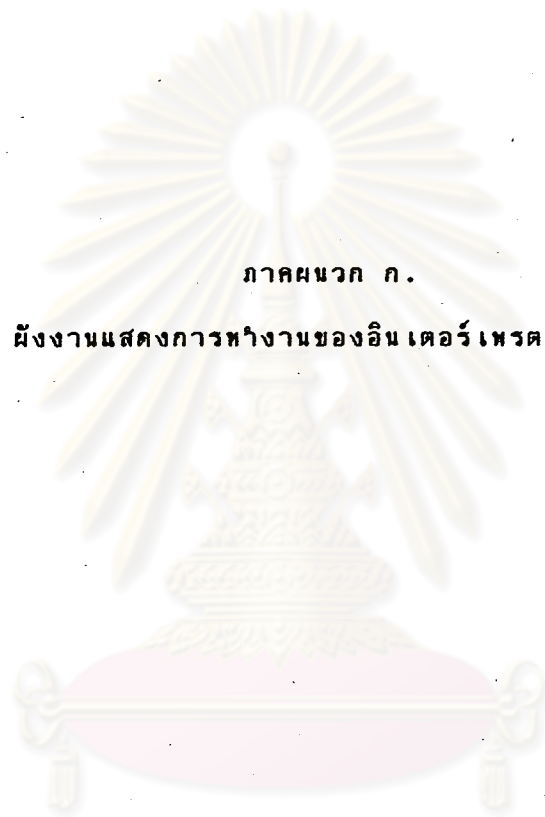


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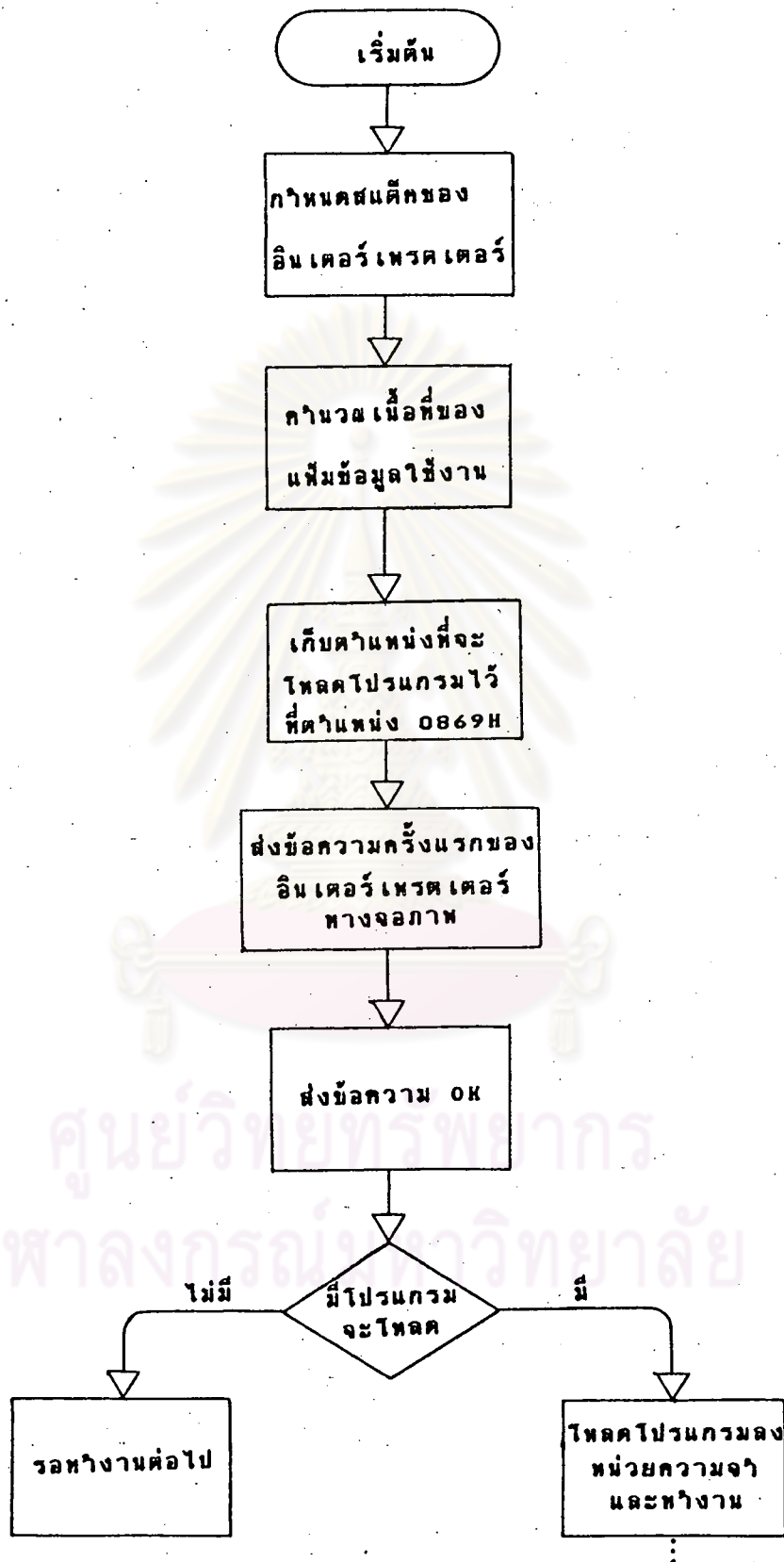
จุฬาลงกรณ์มหาวิทยาลัย




ภาคผนวก ก.

ผังงานแสดงการทำงานของอินเตอร์เฟรตเตอร์

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย





ภาคผนวก ข.

แสดงคำสั่งและรหัสคำสั่งของ MBASIC APPLE II PLUS

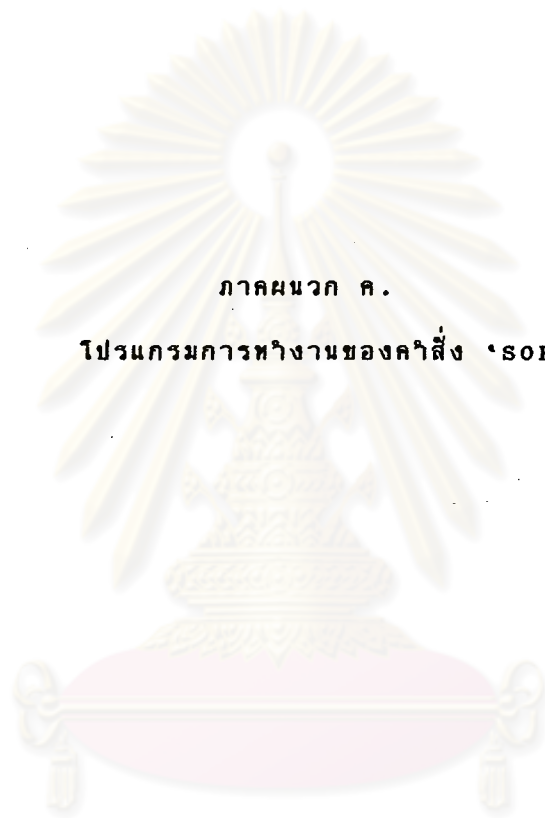
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คำสั่ง	รหัสคำสั่ง	คำสั่ง	รหัสคำสั่ง
AND	F7	DATA	84
ABS	FF86	DIM	86
ATN	FF8E	DEFSTR	A9
ASC	FF94	DEFINT	AA
AUTO	A7	DEFSNG	AB
BUTTON	FFB6	DEFDBL	AC
BEEP	D4	DEF	96
CLOSE	BC	DELETE	A6
CONT	98	DEL	A6
CLEAR	92	END	81
CINT	FF9B	ELSE	9E
CSNG	FF9C	ERASE	A2
CDBL	FF9D	EDIT	A3
CVI	FFAA	ERROR	A4
CVS	FFAB	ERL	E5
CVD	FFAC	ERR	E6
COS	FF8C	EXP	FF8B
CHR\$	FF95	EOF	FFAE
CALL	B1	EQV	FA
COMMON	B3	FOR	82
CHAIN	B4	FIELD	B9
COLOR	CD	FILES	BF

คำสั่ง	รหัสคำสั่ง	คำสั่ง	รหัสคำสั่ง
FN	E2	INVERSE	CA
FRE	FF8F	KILL	C1
FIX	FF9E	LET	88
GOTO	89	LINE	AD
GO TO	89	LOAD	BD
GOSUB	8D	LSET	C2
GET	BA	LPRINT	9B
GR	CC	LLIST	9C
HOME	C7	LPOS	FF9A
HLIN	CE	LIST	93
HGR	D1	LOC	FFAF
HCOLOR	D3	LOG	FF8A
H PLOT	D2	LEN	FF91
HTAB	C9	LEFT\$	FF81
HSCRN	ED	LOF	FFB0
HEX\$	FF99	MERGE	BE
INPUT	85	MOD	FC
IF	8B	MKI\$	FFB1
INSTR	E9	MKS\$	FFB2
INT	FF85	MDS\$	FFB3
IMP	FB	MID\$	FF83
INKEY\$	EE	NEXT	83

คำสั่ง	รหัสคำสั่ง	คำสั่ง	รหัสคำสั่ง
NORMAL	CB	REM	8F
NOTRACE	AO	RESUME	A5
NAME	CO	RSET	C3
NEW	94	RIGHT\$	FF82
NOT	E4	RND	FF88
ON	95	RENUM	A8
OPEN	B8	RESET	C5
OR	F8	RANDOMIZE	B6
OCT\$	FF98	STOP	90
OPTION	B5	SWAP	A1
PUT	BB	SAVE	C4
POKE	97	SPC(E3
PRINT	91	STEP	E0
POS	FF90	SGN	FF84
PEEK	FF96	SQR	FF87
PLOT	DO	SIN	FF89
PDL	FFB5	STR\$	FF92
POP	AE	STRING\$	E7
READ	B7	SPACES\$	FF97
RUN	8A	SYSTEM	B7
RESTORE	8C	SORT	D6
RETURN	8E	TRACE	9F

คำสั่ง	รหัสคำสั่ง	คำสั่ง	รหัสคำสั่ง
TAB (DF	*	F4
TO	DD	/	F5
THEN	DE	~	F6
TAN	FF8D	\	FD
TEXT	C6	'	EA
USING	E8	>	EF
USR	E1		
VAL	FF93		
VARPTR	EB		
VLIN	CF		
VTAB	C8		
VPOS	FFB4		
WIDTH	9D		
WAIT	D5		
WHILE	AF		
WEND	BO		
WRITE	B2		
XOR	F9		
=	F0		
<	F1		
+	F2		
-	F3		



ภาคผนวก ค.

โปรแกรมการทำงานของคำสั่ง 'SORT'

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

MACRO-80 3.44 17-Feb-82

```

;061028
                                ORG 00H
0002      CONSOUT EQU 02H
0009      PRTSTR  EQU 09H
000A      READCONS EQU 0AH
000D      RESETDSK EQU 0DH
000F      OPENF   EQU 0FH
0010      CLOSEF  EQU 10H
0013      DELETEF EQU 13H
0014      READS   EQU 14H
0015      WRITES  EQU 15H
0016      CREATEF EQU 16H
0017      RENAMEF EQU 17H
001A      SETDMA  EQU 1AH
0021      READR   EQU 21H
0024      SETRNDR EQU 24H
0005      BDOS    EQU 0005H
;
; *****
; *                MAIN SORT ROUTINE                *
; *****
;
0000'   C3 003A'   MAIN:   JP   ST01           ; CALL ST01$02 (Analyze field , Initialize)
;DO WHILE NOT EOF
0003'   CD 0029'   LMAIN:  CALL ST03$06       ; ST03 - ST06 (Read key,Sort,Write key/Merge key)
0006'   3A 11AB'   LD    A,(EOFI)
0009'   FE 1A     CP    1AH
;           IF    NOT EOF
000B'   20 F6     JR    NZ,LMAIN
;           ENDF
;ENDDO
000D'   C3 0970'   JP    ST07           ; CALL ST07$08 (Read pattern,Write output)
0010'   CD 0015'   STOP:  CALL CLEARF
0013'   E1       POP   HL           ; get last syntax
0014'   C9       RET              ; end (return to mbasic)
0015'   3A 0893   CLEARF: LD  A,(0893H)       ; clear first byte of each fcb
0018'   47       LD  B,A
0019'   21 0873   LD  HL,0873H
001C'   AF       XOR  A
001D'   04       INC  B
001E'   5E       LCLEARF: LD  E,(HL)
001F'   23       INC  HL
0020'   56       LD  D,(HL)
0021'   23       INC  HL
0022'   12       LD  (DE),A
0023'   10 F9    DJNZ LCLEARF
0025'   CD 554F   CALL 554FH           ; clear file buffer
0028'   C9       RET

```



```
;
; *****
; *          ST03 - ST06          *
; *****
;
0029' CD 02D3' ST03$06: CALL ST03      ; Read key
002C' CD 0501'      CALL ST04      ; Sort key in ascending
002F' 3A 0E1C'      LD  A,(FCBK1+8)
0032' B7            OR  A           ; first ?
;                IF  FIRST
0033' CA 0694'      JP  Z,ST05      ; Write sorted key to keyfile1
;                ELSE
0036' C3 0719'      JP  ST06       ; Merge key
;                ENDIF
0039' C9            RET$03$06: RET      ; Return to main
;
; *****
; *          ST01 - ST02          *
; *****
; *****
; * STEP 01 IS ROUTINE TO ANALYZE FIELD IN SORT STATEMENT *
; *****
;
003A' CD 0221' ST01:  CALL BLANK
;
; *** compare filetype (S or R) ? ***
;
003D' FE 53        CP  53H
003F' 28 09        JR  Z,FTOK
0041' FE 52        CP  52H
0043' 28 05        JR  Z,FTOK
0045' 1E 0D        ERRTYPE: LD  E,0DH      ; type mismatch (filetype error)
0047' C3 0D19'     JP  ERR
004A' 32 0E68'     FTOK:  LD  (FTYPE),A
004D' CD 0220'     CALL LBLANK
0050' FE 2C        CP  2CH
0052' C2 0D0C'     JP  NZ,SYNERR
0055' CD 0220'     CALL LBLANK
0058' E5          PUSH HL           ; save syntax at drive in
0059' CD 0220'     CALL LBLANK
005C' FE 3A        CP  3AH
005E' 28 21        JR  Z,CHKDRI
;
; *** check drive in ***
;
0060' 0E 19        LD  C,19H
0062' CD 0005'     CALL BDOS
0065' B7          OR  A
0066' 28 0E        JR  Z,DRA
```

ศูนย์วิจัยทรัพยากร
สารสนเทศ มหาวิทยาลัย

```

0068' 3D          DEC A
0069' C2 008B'   JP NZ,ERRDR    ; drive not a or b
006C' 3C          DRB: INC A
006D' 32 0E14'   LD (FCBK1),A    ; drive work
0070' 3C          INC A
0071' 32 0E7D'   LD (FCBK1),A    ; drive in
0074' 18 08      JR CONT
0076' 3C          DRA: INC A
0077' 32 0E7D'   LD (FCBK1),A    ; drive in
007A' 3C          INC A
007B' 32 0E14'   LD (FCBK1),A    ; drive work
007E' E1          CONT: POP HL    ; get syntax
007F' 18 22      JR NAMEIN
0081' E1          CHKDRI: POP HL
0082' 7E          LD A,(HL)
0083' FE 41      CP 41H        ; compare drive in (a or b) ?
0085' 28 09      JR Z,DRIOK
0087' FE 42      CP 42H
0089' 28 05      JR Z,DRIOK
008B' 1E 45      ERRDR: LD E,45H    ; drive select error
008D' C3 0D19'   JP ERR
0090' D6 40      DRIOK: SUB 40H
0092' 32 0E7D'   LD (FCBK1),A    ; drive in
0095' 3D          DEC A
0096' 20 02      JR NZ,DRW
0098' 3C          INC A
0099' 3C          INC A
009A' 32 0E14'   DRW: LD (FCBK1),A ; drive work
009D' CD 0220'   CALL LBLANK
00A0' CD 0220'   CALL LBLANK
;
; *** check name in ***
;
00A3' 11 0E7E'   NAMEIN: LD DE,FCBK1+1
00A6' CD 015D'   CALL NAMEF
00A9' CD 0220'   CALL LBLANK
00AC' E5          PUSH HL        ; save syntax at drive out
00AD' CD 0220'   CALL LBLANK
00B0' FE 3A      CP 3AH
00B2' 28 11      JR Z,CHKDRO
;
; *** check drive out ***
;
00B4' 0E 19      LD C,19H
00B6' CD 0005'   CALL BDOS
00B9' FE 02      CP 2
00BB' D2 008B'   JP NC,ERRDR    ; drive not a or b
00BE' 3C          INC A
00BF' 32 0E5C'   LD (NAME0),A
00C2' E1          POP HL

```

```

00C3' 18 16          JR  NAMEOUT
00C5' E1             CHKDRO: POP HL
00C6' 7E            LD  A,(HL)
00C7' FE 41         CP  41H          ; compare drive-out (a or b) ?
00C9' 28 05         JR  Z,DROOK
00CB' FE 42         CP  42H
00CD' C2 008B'      JP  NZ,ERRDR      ; drive out error
00D0' D6 40         DROOK: SUB 40H
00D2' 32 0ESC'      LD  (NAME0),A
00D5' CD 0220'      CALL LBLANK
00D8' CD 0220'      CALL LBLANK
;
; *** check name out ***
;
00DB' 11 0E5D'      NAMEOUT: LD  DE,NAME0+1
00DE' CD 015D'      CALL NAMEF
00E1' CD 0220'      CALL LBLANK
00E4' FE 41         CP  41H          ; compare sort-type ( a or d) ?
00E6' 28 07         JR  Z,STOK
00E8' FE 44         CP  44H
00EA' 28 03         JR  Z,STOK
00EC' C3 0045'      JP  ERRTYPE      ; sort type error
;
; *** check sort type ***
;
00EF' 32 0E69'      STOK:  LD  (STYPE),A
00F2' CD 0220'      CALL LBLANK
00F5' FE 28         CP  28H
00F7' C2 0D0C'      JP  NZ,SYNERR
;
; *** # key and length of key ***
;
00FA' 01 0400          LD  BC,0400H
00FD' 11 11AE'          LD  DE,KEYLEN
0100' CD 0220'      LOOPKL: CALL LBLANK
0103' FE 23          CP  23H
0105' C2 0D0C'      JP  NZ,SYNERR
0108' CD 0132'      CALL CHECKKL      ; check key
010B' CD 0142'      CALL STOREKL      ; store key
010E' CD 0220'      CALL LBLANK
0111' FE 2C          CP  2CH
0113' C2 0D0C'      JP  NZ,SYNERR
0116' CD 0132'      CALL CHECKKL      ; check length
0119' CD 0142'      CALL STOREKL      ; store length
011C' CD 0145'      CALL SUMLEN       ; sum length
011F' CD 0220'      CALL LBLANK
0122' FE 29          CP  29H
0124' CA 01AD'      JP  Z,KEYEND
0127' 05            DEC  B
0128' CA 0D0C'      JP  Z,SYNERR

```

```

012B' FE 2C CP 2CH
012D' C2 ODOC' JP NZ,SYNERR
0130' 18 CE JR LOOPKL
0132' CD 0220' CHECKKL: CALL LBLANK
0135' FE OF CP OFH
0137' CC 013F' CALL Z,INXH ; inx hl
013A' C8 RET Z
013B' CD 0148' CALL VALLE9
013E' C9 RET
013F' 23 INXH: INC HL
0140' 7E LD A,(HL)
0141' C9 RET
0142' 12 STOREKL: LD (DE),A
0143' 13 INC DE
0144' C9 RET
0145' 81 SUMLEN: ADD A,C ; length in c
0146' 4F LD C,A
0147' C9 RET
0148' CD 0156' VALLE9: CALL CHECKNUM
014B' DA ODOC' JP C,SYNERR
014E' E6 OF AND OFH
0150' 3D DEC A
0151' B7 OR A
0152' CA ODOC' JP Z,SYNERR
0155' C9 RET
0156' FE 11 CHECKNUM: CP 11H
0158' D8 RET C
0159' FE 18 CP 18H
015B' 3F CCF
015C' C9 RET
;
; *** check file name ***
;
015D' 06 08 NAMEF: LD B,08
015F' 7E LD A,(HL)
0160' FE 2E L010: CP 2EH
0162' CA 019E' JP Z,ERRFN
0165' 12 L011: LD (DE),A
0166' 23 INC HL
0167' 7E LD A,(HL)
0168' 13 INC DE
0169' 05 DEC B
016A' CA 01A3' JP Z,L017
016D' FE 2E CP 2EH
016F' 28 OF JR Z,L012
0171' FE 2C CP 2CH
0173' 20 FO JR NZ,L011
0175' 78 LD A,B
0176' C6 03 ADD A,3
0178' 47 LD B,A

```



ศูนย์คลังทรัพยากร
 ภาควิชาคอมพิวเตอร์ มหาวิทยาลัยราชภัฏบรจรัม

```

0179' 3E 20
017B' 12
017C' 13
017D' 10 FC
017F' C9
0180' CD 0192'
0183' 06 03
0185' 23
0186' 7E
0187' FE 2C
0189' 28 07
0188' 12
018C' 13
018D' 05
018E' 28 09
0190' 18 F3
0192' 3E 20
0194' 12
0195' 13
0196' 10 FC
0198' C9
0199' 23
019A' 7E
019B' FE 2C
019D' C8
019E' 1E 40
01A0' C3 0D19'
01A3' FE 2E
01A5' 28 DC
01A7' FE 2C
01A9' 20 F3
01AB' 18 E5

LD A,20H
L011C: LD (DE),A
INC DE
DJNZ L011C
RET
L012: CALL PLO15
L013: LD B,03
L014: INC HL
LD A,(HL)
CP 2CH
JR Z,PLO15
LD (DE),A
INC DE
DEC B
JR Z,L016
JR L014
PLO15: LD A,20H
L015: LD (DE),A
INC DE
DJNZ L015
RET
L016: INC HL
LD A,(HL)
CP 2CH
RET Z
ERRFN: LD E,40H ; bad file name
JP ERR
L017: CP 2EH
JR Z,L013
CP 2CH
JR NZ,ERRFN
JR PLO15
;
; *** check record length for rnd. file ***
; *** and check for drive work ***
;
01AD' 3E 00
01AF' 12
0180' 3A 0E68'
01B3' FE 53
01B5' 28 15
01B7' CD 0220'
018A' FE 0F
018C' CC 013F'
01BF' 28 07
01C1' FE 1C
01C3' 28 4C
01C5' CD 0148'
01C8' 3D
01C9' 32 0E6F'

KEYEND: LD A,00
LD (DE),A
LD A,(FTYPE)
CP 53H
JR Z,SEQ
CALL LBLANK
CP 0FH
CALL Z,INXH
JR Z,STORERL
CP 1CH
JR Z,GE255
CALL VALLE9
STORERL: DEC A
LD (RECL),A

```

```

01CC' 23          SEQ:  INC HL
01CD' 7E          LD  A,(HL)
01CE' FE F5      CP  OFSH
01D0' 20 08      JR  NZ,ENDING
01D2' 3A 0E7D'   LD  A,(FCBK1)
01D5' 32 0E14'   LD  (FCBK1),A ; drive work = drive in
01D8' 23          INC HL
01D9' 7E          LD  A,(HL)
01DA' FE 3A      ENDING: CP  3AH
01DC' 28 04      JR  Z,ENDINGOK
01DE' B7         OR  A
01DF' C2 0DOC'   JP  NZ,SYNERR
01E2' E5         ENDINGOK: PUSH HL ; save last addr of syntax
;
; *** check total key > 83 ? ***
;
01E3' 79          LD  A,C
01E4' 47          LD  B,A
01E5' C6 03      ADD  A,03
01E7' 4F          LD  C,A
01E8' ED 43 0E6A' LD  (KEYLCH),BC ; b = real keyl , c = real keyl + 3
01EC' FE 54      CP  84
01EE' D2 0227'   JP  NC,ERRLEN
;
; *** check key duplicate ? ***
;
01F1' 11 11AE'   CHKDUP: LD  DE,KEYLEN
01F4' 0E 04      LD  C,4
01F6' 0D         LCHKDUP: DEC  C
01F7' 28 33      JR  Z,STO2
01F9' 41         LD  B,C
01FA' 62         LD  H,D
01FB' 6B         LD  L,E
01FC' 23         LDUP:  INC  HL
01FD' 23         INC  HL
01FE' 7E         LD  A,(HL)
01FF' B7         OR  A
0200' 28 07      JR  Z,CHKDUPC
0202' 1A         LD  A,(DE)
0203' AE         XOR  (HL)
0204' CA 0DOC'   JP  Z,SYNERR
0207' 10 F3      DJNZ LDUP
0209' 13         CHKDUPC: INC  DE
020A' 13         INC  DE
020B' 1A         LD  A,(DE)
020C' B7         OR  A
020D' 20 E7      JR  NZ,LCHKDUP
020F' 18 1B      JR  STO2
0211' 23         GE255: INC  HL
0212' 7E         LD  A,(HL)

```



```

0213' B7 OR A
0214' 20 11 JR NZ,ERRLEN ; too long rec length
0216' 23 INC HL
0217' 7E LD A,(HL)
0218' FE 01 CP 01
021A' 20 0B JR NZ,ERRLEN ; too long rec length
021C' 3E FF LD A,OFFH
021E' 18 A8 JR STORERL
0220' 23 LBLANK: INC HL
0221' 7E BLANK: LD A,(HL)
0222' FE 20 CP 20H
0224' 28 FA JR Z,LBLANK
0226' C9 RET
0227' 1E 0F ERRLEN: LD E,OFH ; string too long (too long length)
0229' C3 0D19' JP ERR
;
; *****
; * STEP 02 IS ROUTINE FOR AVAILABLE MEMORY (COMPUTE MAX RECNO) *
; *****
;
022C' CD 4C71 ST02: CALL 4C71H ; call fre
022F' ED 5B 0B94 LD DE,(0B94H) ; over variable table (0B94)
0233' ED 53 0E7B' LD (KEY),DE
0237' 2A 0B6B LD HL,(0B6BH) ; under string table (0B6B)
;
; *** recno = ((y) - (x)) / keyl ***
;
023A' CD 0C80' CALL SUBDE
023D' 22 0E79' LD (FREE),HL ; free = (0B6B) - (0B94)
0240' ED 4B 0E6A' LD BC,(KEYLCM)
0244' 06 00 LD B,00
0246' CD 0C88' CALL DIV
0249' 7A LD A,D
024A' B3 OR E
024B' 20 01 JR NZ,ST02C
024D' 13 INC DE
024E' ED 53 0E77' ST02C: LD (RECNO),DE ; recno = free / keyl
;
; *** free : 10 * keyl + 1 ? ***
;
0252' 59 LD E,C ; keyl still in c
0253' 16 00 LD D,00H
0255' 3E 0A LD A,10
0257' CD 0CA3' CALL MULT
025A' ED 5B 0E79' LD DE,(FREE)
025E' E8 EX DE,HL
025F' 13 INC DE
0260' B7 OR A ; set carry off
0261' ED 52 SBC HL,DE
0263' DA 0D10' JP C,ERRSPC

```

```

0266' CD 25C3          CALL 25C3H          ; home
0269' 3E 06           LD A,06
026B' CD 255E          CALL 255EH          ; line 7
026E' 3E 18           LD A,24
0270' CD 25B5          CALL 25B5H          ; col 25
0273' 11 0D21'        LD DE,PUTDSKI
0276' CD 0C7C'        CALL MSGPRT
0279' 3A 0E7D'        LD A,(FCBK1)
027C' C6 40           ADD A,40H
027E' CD 0C76'        CALL MSGDR
0281' 3E 09           LD A,09
0283' CD 255E          CALL 255EH          ; line 10
0286' 3E 0F           LD A,15
0288' CD 25B5          CALL 25B5H          ; col 16
028B' 11 0D40'        LD DE,PUTDSKW
028E' CD 0C7C'        CALL MSGPRT
0291' 3A 0E14'        LD A,(FCBK1)
0294' C6 40           ADD A,40H
0296' CD 0C76'        CALL MSGDR
0299' 3E 0B           LD A,11
029B' CD 255E          CALL 255EH          ; line 12
029E' 3E 15           LD A,21
02A0' CD 25B5          CALL 25B5H          ; col 22
02A3' 11 0D71'        LD DE,PUTDSKWC
02A6' CD 0C7C'        CALL MSGPRT
02A9' 06 20           LD B,32
02AB' 11 0E15'        LD DE,FCBK1+1
02AE' CD 0C70'        CALL CLEARO        ; create keyfile1
02B1' 01 000C          LD BC,12
02B4' 21 0E14'        LD HL,FCBK1
02B7' 11 0E38'        LD DE,FCBK0
02BA' ED 80           LDIR                ; create keyfile2
02BC' 32 11BC'        LD (BYTEI),A
02BF' 32 11AB'        LD (EOFI),A        ; initial eofi
02C2' 3C              INC A
02C3' 3C              INC A
02C4' 32 0E40'        LD (FCBK0+8),A    ; create keyfile2
02C7' CD 0C36'        CALL MSG$OPENI
02CA' 21 0000          LD HL,00
02CD' 22 0E75'        LD (ALLREC),HL
02D0' C3 0003'        JP LMAIN           ; return to main
;
; *****
; * STEP 03 IS ROUTINE TO READ KEY OF INPUT TO MEMORY AND SORT *
; *****
;
02D3' 2A 0E77'        ST03: LD HL,(RECNO)
02D6' 22 11BF'        LD (LOW),HL        ; save recno-w
02D9' 21 0000          LD HL,00
02DC' 22 0E71'        LD (RECA),HL

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```

02DF' 2A 0E7B' LD HL,(KEY)
02E2' 22 11A7' LD (DMAW),HL ; dmaw = key
02E5' 3A 0E68' LD A,(FTYPE)
02E8' FE 52 CP 52H ; ftype = R or I ?
02EA' CA 0388' JP Z,ST03R
;
; *** st03..input seq ***
;
02ED' 11 0EA1' ST03S: LD DE,DMAKI
02F0' D5 PUSH DE ; dmabf = dmaki
02F1' ED 53 11A1' LD (DMABEG),DE ; dmabeg = dmaki
02F5' 3A 11BC' LD A,(BYTEI)
02F8' 4F LD C,A
02F9' B7 OR A
02FA' CC 0477' CALL Z,ST03INIT ; readlec at dmaki , bytei = 128 , rec = fcbki + 33
02FD' D1 LOGRECS: POP DE ; dmabf
02FE' 1A LD A,(DE)
02FF' FE 1A CP 1AH
0301' CA 04EF' JP Z,LEOFIO ; that log rec no significant and eof
;
; *** check for 1 record of seq. ***
;
0304' FE 0A LLOGRECS: CP 0AH
0306' 28 0C JR Z,ENDLOGS
0308' 13 INC DE
0309' 0D DEC C
030A' 1A LD A,(DE)
030B' 20 F7 JR NZ,LLOGRECS
030D' D5 PUSH DE ; dmabf
030E' CD 04A5' CALL READLEC ; set bytei = 128 in c
0311' D1 POP DE ; dmabf
0312' 18 F0 JR LLOGRECS
0314' 13 ENDLOGS: INC DE
0315' 0D DEC C
0316' 28 08 JR Z,MOVESORT
0318' 1A LD A,(DE)
0319' 32 11AB' LD (EOF1),A
031C' ED 53 11A3' LD (DMAO),DE ; dmaend
;
; *** move all key for sorting into buffer ***
;
0320' 79 MOVESORT: LD A,C
0321' 32 11BC' LD (BYTEI),A ; save bytei
0324' CD 049C' KVSFS: CALL LDADMA ; set field = 1 , dmabf = dmabeg
0327' 21 11AE' LD HL,KEYLEN
032A' 7E LD A,(HL) ; key
;
; *** key (i) : field (j) ? ***
;
032B' 57 LKVSFS: LD D,A

```



```

032C' 23          INC HL
032D' 5E          LD E,(HL)      ; len
032E' 23          INC HL
032F' E5          PUSH HL        ; keylenw
0330' D5          PUSH DE        ; save key and len
0331' B9          CP C          ; k - f ?
0332' 38 08       JR C,KLTF      ; k < f
0333' 28 2B       JR Z,KEQF      ; k = f
0334' 57          LD D,A        ; k > f , save k in d
0335' CD 034B'    CALL INRF
0336' 18 05       JR LKGTFF
;
; *** key (i) < field (j) ***
;
033C' CD 049C'    KLTF: CALL LDADMA
033D' 18 01       JR KGTFF
033E' 7A          LKGTFF: LD A,D      ; get key from d
;
; *** key (i) > field (j) ***
;
0342' B9          KGTFF: CP C          ; k - f ? again when k > f ago
0343' 28 1C       JR Z,KEQF      ; k = f
0344' 57          LD D,A        ; f sill < k , save key in d
0345' CD 034B'    CALL INRF
0346' 18 F6       JR LKGTFF
0347' 2A 11A5'    INRF: LD HL,(DMABF) ; increment field routine
0348' 7E          LINRF: LD A,(HL)
0349' FE 2C       CP 2CH
0350' 28 08       JR Z,INRFSTOP
0351' FE 0D       CP ODH
0352' CA 0D09'    JP Z,PSYNERR ; key more than field
0353' 23          INC HL
0354' 18 F3       JR LINRF
0355' 0C          INRFSTOP: INC C ; field = field + 1
0356' 23          INC HL
0357' 22 11A5'    LD (DMABF),HL
0358' C9          RET
;
; *** key (i) = field (j) ***
;
; current field in c
0361' 06 00       KEQF: LD B,00      ; lenw = 0
0362' ED 5B 11A7' LD DE,(DMAW)
0363' 2A 11A5'    LD HL,(DMABF)
0364' 7E          LKEQF: LD A,(HL)
0365' 23          INC HL
0366' FE 2C       CP 2CH
0367' 28 09       JR Z,CHKLEN
0368' FE 0D       CP ODH
0369' 28 05       JR Z,CHKLEN

```

```

0374' 12          LD  (DE),A
0375' 13          INC DE
0376' 04          INC B
0377' 18 F1       JR  LKEQF
;
; *** length of key in statement = in real record ? ***
;
0379' 22 11A5'   CHKLEN: LD  (DMABF),HL ; save dmabf next
037C' ED 53 11A7' LD  (DMAW),DE
0380' D1          POP DE
0381' 7B          LD  A,E ; get len
0382' B8          CP  B
0383' C2 0D09'   JP  NZ,PSYNERR ; length of key not match
0386' 0C          INC C
0387' E1          POP HL ; keylenw
0388' 7E          LD  A,(HL)
0389' B7          OR  A
038A' C2 032B'   JP  NZ,LKVSFS
038D' CD 0486'   CALL MOVEPATN
0390' CD 048B'   CALL CHKEOF
0393' 3A 11BC'   LD  A,(BYTEI)
0396' 32 0E6E'   LD  (SUBREC),A
0399' B7          OR  A
039A' CA 02ED'   JP  Z,STO3S
039D' 4F          LD  C,A
039E' 3E 80      LD  A,128
03A0' 91          SUB C
03A1' 32 0E6E'   LD  (SUBREC),A
03A4' 2A 11A3'   LD  HL,(DMAO) ; dmaend
03A7' 06 00      LD  B,0
03A9' 11 0EA1'   LD  DE,DMAKI
03AC' ED 53 11A1' LD  (DMABEG),DE
03B0' D5          PUSH DE ; save dmabf
03B1' C5          PUSH BC ; save bytei
03B2' ED 80      LDIR ; (dmaend) --> (dmaki) ...(bytei)
03B4' C1          POP BC ; get bytei in c
03B5' C3 02FD'   JP  LOGRECS
;
; *** st03...input rnd ***
;
03B8' 11 0EA1'   ST03R: LD  DE,DMAKI
03BB' ED 53 11A1' LD  (DMABEG),DE
03BF' ED 53 11A5' LD  (DMABF),DE ; dmabf = dmabeg = dmaki
03C3' 3A 11BC'   LD  A,(BYTEI)
03C6' B7          OR  A
03C7' 20 07      JR  NZ,LOGRECR
03C9' CD 0477'   CALL ST03INIT ; read input in dmaki , bytei = 128 , rec = fcbki+33
03CC' 79          LD  A,C
03CD' 32 11BC'   LD  (BYTEI),A
03D0' 3A 0E6F'   LOGRECR: LD  A,(RECL)

```

```

03D3' 32 11BD' LD (BYTE1),A ; reqlw
03D6' 3A 11BC' LD A,(BYTE1)
03D9' 3C INC A
03DA' 32 11BC' LD (BYTE1),A
03DD' 3A 11BC' LLOGRECR: LD A,(BYTE1)
03E0' 4F LD C,A
03E1' 3A 11BD' LD A,(BYTE1) ; reqlw
03E4' 5F LD E,A ; save reqlw in e
03E5' 91 SUB C ; reqlw - bytei
03E6' 38 1F JR C,ENDLOGRC ; reqlw < bytei
03E8' 28 2B JR Z,ENDLOGRZ ; reqlw = bytei
; reqlw > bytei
; reqlw = reqlw - bytei
03EA' 32 11BD' LD (BYTE1),A ; reqlw = reqlw - bytei
03ED' 06 00 LD B,00
03EF' 2A 11A5' LD HL,(DMABF)
03F2' 09 ADD HL,BC
03F3' 22 11A5' LD (DMABF),HL ; dmabf = dmabf + bytei
03F6' EB EX DE,HL
03F7' CD 04A5' CALL READLEC ; read input at dmabf , bytei = 128
03FA' 79 LD A,C
03FB' 32 11BC' LD (BYTE1),A
03FE' 2A 11A5' LD HL,(DMABF)
0401' 7E LD A,(HL)
0402' 32 11AB' LD (EOF1),A
0405' 18 D6 JR LLOGRECR
0407' 79 ENDLOGRC: LD A,C ; bytei still in c
0408' 93 SUB E ; reqlw still in e
0409' 32 11BC' LD (BYTE1),A ; bytei = bytei - reqlw
040C' 4F LD C,A
040D' 3E 80 LD A,128
040F' 91 SUB C
0410' 32 11BE' LD (BYTEMOVE),A ; save subrec = 128 - bytei +reqlw
0413' 18 06 JR ENDLOGR
0415' 32 11BE' ENDLOGRZ: LD (BYTEMOVE),A ; save subrec = 0
0418' 32 11BC' LD (BYTE1),A ; bytei = 0
041B' 3A 0E6F' ENDLOGR: LD A,(RECL)
041E' 5F LD E,A
041F' 16 00 LD D,00
0421' 2A 11A1' LD HL,(DMABEG)
0424' 19 ADD HL,DE
0425' 22 11A3' LD (DMAO),HL ; dmaend = dmabeg + reql
0428' 21 11AE' KVSFR: LD HL,KEYLEN
042B' 7E LD A,(HL) ; key
;
; *** key (i) : field (j) ? ***
;
LKVSFR: INC HL
042C' 23 LD E,(HL) ; len
042D' 5E INC HL
042E' 23 INC HL
042F' 55 PUSH HL ; keylenw

```

```

0430' 4F          LD C,A
0431' 0D          DEC C
0432' 06 00       LD B,00
0434' 2A 11A1'    LD HL,(DHABEG)
0437' 09          ADD HL,BC
0438' 22 11A5'    LD (DMABF),HL ; dmabf = dmabeg + k
0438' 4B          LD C,E ; get len
043C' ED 5B 11A7' LD DE,(DMAW)
0440' ED 80       LDIR ; dmaw = dmabf , (len)
0442' ED 53 11A7' LD (DMAW),DE
0446' E1          POP HL ; keylenw
0447' 7E          LD A,(HL)
0448' B7          OR A
0449' 20 E1       JR NZ,LKVSFR
044B' CD 0486'    CALL MOVEPATN
044E' 3A 11BE'    LD A,(BYTEMOVE) ; save subrec
0451' 32 0E6E'    LD (SUBREC),A
0454' 2A 11A3'    LD HL,(DMAO) ; dmaend
0457' 7E          LD A,(HL)
0458' 32 11AB'    LD (EOFI),A
045B' CD 04BB'    CALL CHKEOF
045E' 3A 11BC'    LD A,(BYTEI)
0461' 4F          LD C,A
0462' 06 00       LD B,0
0464' 11 0EA1'    LD DE,DMAKI
0467' ED 53 11A1' LD (DHABEG),DE
046B' ED 53 11A5' LD (DMABF),DE
046F' 2A 11A3'    LD HL,(DMAO) ; dmaend
0472' ED 80       LDIR ; dmaend --> dmaki
0474' C3 03D0'    JP LOGRECR
0477' CD 04A5'    STOSINIT: CALL READLEC
047A' 3E 00       LD A,00
047C' 32 0E6E'    LD (SUBREC),A
047F' 2A 0E9E'    LD HL,(FCBKI+33)
0482' 22 0E6C'    LD (REC),HL
0485' C9          RET
0486' 2A 11A7'    MOVEPATN: LD HL,(DMAW)
0489' 3A 0E6E'    LD A,(SUBREC)
048C' 77          LD (HL),A
048D' 23          INC HL
048E' 3A 0E6C'    LD A,(REC)
0491' 77          LD (HL),A
0492' 23          INC HL
0493' 3A 0E6D'    LD A,(REC+1)
0496' 77          LD (HL),A
0497' 23          INC HL
0498' 22 11A7'    LD (DMAW),HL
0498' C9          RET
049C' 2A 11A1'    LDADMA: LD HL,(DHABEG)
049F' 22 11A5'    LD (DMABF),HL ; dmabf = dmabeg

```

```

04A2' 0E 01          LD C,01          ; set field = 1
04A4' C9             RET
; read input 128 bytes at dmabf (dmafi)
04A5' 0E 1A          READLEC: LD C,SETDMA
04A7' CD 0005        CALL BDOS
04AA' 0E 24          LD C,SETRNDR
04AC' 11 0E7D'       LD DE,FCBKI
04AF' CD 0005        CALL BDOS
04B2' 11 0E7D'       LD DE,FCBKI
04B5' CD 0BAC'       CALL READIS
04B8' 0E 80          LD C,128          ; set bytei = 128 in c
04BA' C9             RET
04BB' 2A 0E9E'       CHKEOF: LD HL,(FCBKI+33)
04BE' 22 0E6C'       LD (REC),HL
04C1' 3A 11AB'       LD A,(EOFI)
04C4' FE 1A          CP 1AH
04C6' 28 24          JR Z,LEOFI$POP
04C8' 2A 11BF'       LD HL,(LOW)      ; recnow
04CB' 2B             DEC HL
04CC' 7C             LD A,H
04CD' B5             OR L
04CE' 28 04          JR Z,ENDSTO3    ; do not use recnow
04D0' 22 11BF'       LD (LOW),HL     ; recnow
04D3' C9             RET
04D4' E1             ENDSTO3: POP HL  ; delete sp
04D5' 2A 0E77'       LD HL,(RECNO)
04D8' 22 0E71'       LD (RECA),HL
04DB' 3A 11BC'       LD A,(BYTEI)
04DE' B7             OR A
04DF' C8             RET Z           ; return to st03$06
04E0' 11 0EA1'       SAVEBF04: LD DE,DMAKI
04E3' 2A 11A3'       LD HL,(DMAO)    ; dmaend
04E6' 4F             LD C,A
04E7' 06 00          LD B,0
04E9' ED 80          LDIR
04EB' C9             RET           ; return to st03$06
04EC' D1             LEOFIS$POP: POP DE ; delete sp
04ED' 18 03          JR LEOFIS
04EF' 32 11AB'       LEOFIS: LD (EOFI),A
04F2' ED 5B 11BF'    LEOFIS: LD DE,(LOW) ; recnow
04F6' 2A 0E77'       LD HL,(RECNO)
04F9' B7             OR A           ; set carry off
04FA' ED 52          SBC HL,DE
04FC' 23             INC HL
04FD' 22 0E71'       LD (RECA),HL   ; reca = recno - recnow
0500' C9             RET           ; return to st03$06

```

```

;
; *****
; * STEP 04 IS ROUTINE TO SORT KEY IN MEMORY IN ASCENDING *
; *****

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;
; *** ST041 ...initial ***
;
0501' 2A 0E71' ST04: LD HL,(RECA)
0504' 22 11C2' LD (HIGH),HL ; high = reca
0507' ED 5B 0E75' LD DE,(ALLREC)
0508' 19 ADD HL,DE
050C' 22 0E75' LD (ALLREC),HL
050F' 3E 01 LD A,01
0511' 32 11B0' LD (BYTE1),A ; pt
0514' 21 0001 LD HL,1
0517' 22 11BF' LD (LOW),HL ; low = 1
;
; *** ST042... process new block ***
;
051A' ED 5B 11BF' ST042: LD DE,(LOW)
051E' ED 53 11C4' LD (II),DE ; i = low
0522' 2A 11C2' LD HL,(HIGH)
0525' 22 11C6' LD (JJ),HL ; J = high
0528' B7 OR A ; set carry = 0
0529' ED 52 SBC HL,DE ; high - low
052B' DA 0647' JP C,ST046 ; high < low
052E' CA 0647' JP Z,ST046 ; high = low
0531' 3A 0E6A' LD A,(KEYLCM) ; high > low
0534' 4F LD C,A
0535' ED 5B 11C6' LD DE,(JJ)
0539' CD 065D' CALL ADDRK ; search akj = addr of key + (j * keyl)
053C' 22 11A7' LD (DMAW),HL ; akj
053F' ED 5B 11C4' LD DE,(II)
0543' 79 LD A,C
0544' CD 065D' CALL ADDRK ; search aki = addr of key + (i * keyl)
0547' 22 11A5' LD (DMABF),HL ; aki
054A' 11 1121' LD DE,DMAKO ; kref
054D' 06 00 LD B,0
054F' ED 80 LDIR ; kref (-- k(l))
;
; *** ST043...right to left scan (LE) ***
;
0551' ED 4B 0E6A' ST043: LD BC,(KEYLCM) ; b = keylwc , c = keylwm
0555' ED 5B 11A7' LD DE,(DMAW) ; akj
0559' 1A LD A,(DE)
055A' 21 1121' LD HL,DMAKO ; kref
055D' 96 STRL: SUB (HL) ; k(jj) - kref
055E' 38 07 JR C,STRLY ; k(jj) < kref
0560' 20 2B JR NZ,STRLN ; k(jj) > kref
0562' 13 INC DE ; k(jj) = kref
0563' 23 INC HL
0564' 1A LD A,(DE)
0565' 10 F6 DJNZ STRL
0567' ED 5B 11C4' STRLY: LD DE,(II)

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056B' 2A 11C6' LD HL,(JJ)
056E' 06 00 LD B,0
0570' B7 OR A ; set carry off
0571' ED 52 SBC HL,DE ; j - i ?
0573' 38 1D JR C,ST3Y ; j < i
0575' 28 1B JR Z,ST3Y ; j = i
; ST3N
0577' 2A 11C4' LD HL,(II) ; j > i
057A' 23 INC HL
057B' 22 11C4' LD (II),HL
057E' ED 5B 11A5' LD DE,(DMABF) ; aki
0582' 2A 11A7' LD HL,(DMAW) ; akj
0585' ED 80 LDIR ; k(ii) = k(jj)
0587' ED 53 11A5' LD (DMABF),DE ; aki
058B' 18 11 JR ST044
058D' CD 0667' STRLN: CALL DCRJ
0590' 18 BF JR ST043
0592' ED 5B 11A5' ST3Y: LD DE,(DMABF) ; aki
0596' 21 1121' LD HL,DMAKO ; kref
0599' ED 80 LDIR ; k(ii) = kref
059B' C3 060D' JP ST045
;
; *** ST044...left to right scan (GE) ***
;
059E' ED 4B 0E6A' ST044: LD BC,(KEYLCM) ; b = keylwc , c = keylwm
05A2' 1A LD A,(DE)
05A3' 21 1121' LD HL,DMAKO ; kref
05A6' 96 STRL: SUB (HL) ; k(ii) - kref
05A7' DA 05E4' JP C,STLRN ; k(ii) < kref
05AA' 20 05 JR NZ,STLRY ; k(ii) > kref
05AC' 13 INC DE ; k(ii) = kref
05AD' 23 INC HL
05AE' 1A LD A,(DE)
05AF' 10 F5 DJNZ STLR
05B1' ED 5B 11C4' STLRY: LD DE,(II) ; k(ii) > kref
05B5' 2A 11C6' LD HL,(JJ)
05B8' 06 00 LD B,0
05BA' B7 OR A ; set carry off
05BB' ED 52 SBC HL,DE ; j - i
05BD' 38 13 JR C,ST4Y ; j < i
05BF' 28 11 JR Z,ST4Y ; j = i
; ST4N
05C1' ED 5B 11A7' LD DE,(DMAW) ; akj ... j > i
05C5' 2A 11A5' LD HL,(DMABF) ; aki
05C8' C5 PUSH BC
05C9' ED 80 LDIR ; k(j) = k(i)
05CB' C1 POP BC
05CC' CD 0667' CALL DCRJ
05CF' C3 0551' JP ST043
05D2' ED 5B 11A7' ST4Y: LD DE,(DMAW) ; akj

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05D6' 21 1121'          LD HL,DMAKO          ; kref
05D9' ED 80             LDIR                ; k(jj) = kref
05DB' 2A 11C6'          LD HL,(JJ)
05DE' 22 11C4'          LD (II),HL          ; i = j
05E1' C3 060D'          JP ST045
05E4' ED 5B 11C6'      STLRN: LD DE,(JJ)
05E8' 2A 11C4'          LD HL,(II)
05EB' 06 00             LD B,0
05ED' B7                OR A                ; set carry off
05EE' ED 52             SBC HL,DE           ; i - j ?
05FO' 30 12            JR NC,ST4S1Y        ; i ) = j

; ST4S1N
05F2' 2A 11C4'          LD HL,(II)          ; i < j
05F5' 23                INC HL
05F6' 22 11C4'          LD (II),HL          ; i = i + 1
05F9' 2A 11A5'          LD HL,(DMABF)       ; aki
05FC' 09                ADD HL,BC
05FD' 22 11A5'          LD (DMABF),HL       ; aki
0600' EB                EX DE,HL
0601' C3 059E'          JP ST044
0604' ED 5B 11A5'      ST4S1Y: LD DE,(DMABF) ; aki
0608' 21 1121'          LD HL,DMAKO         ; kref
060B' ED 80             LDIR                ; k(ii) = kref

;
; *** ST045...push stack ***
;
060D' ED 4B 11C4'      ST045: LD BC,(II)
0611' 2A 11C2'          LD HL,(HIGH)
0614' ED 5B 11BF'      LD DE,(LOW)
0618' 19                ADD HL,DE           ; high + low
0619' B7                OR A                ; set carry off
061A' ED 42             SBC HL,BC           ; high + low - i
061C' B7                OR A                ; set carry off
061D' ED 42             SBC HL,BC           ; high + low - i - i
061F' 38 13            JR C,ST5Y           ; (high - i) < (i - low)
0621' 28 11            JR Z,ST5Y           ; (high - i) = (i - low)

; ST5N
0623' 03                INC BC
0624' ED 5B 11C2'      LD DE,(HIGH)
0628' CD 067B'          CALL PUSHST         ; push ( i+1 , h ) ...push bc,de
062B' 0B                DEC BC
062C' 0B                DEC BC
062D' ED 43 11C2'      LD (HIGH),BC       ; high = i - 1
0631' C3 051A'          JP ST042
0634' 50                ST5Y: LD D,B         ; i in bc
0635' 59                LD E,C             ; I in de
0636' 1B                DEC DE
0637' ED 4B 11BF'      LD BC,(LOW)
063B' CD 067B'          CALL PUSHST         ; push ( l , i-1 )
063E' 13                INC DE

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```

063F' 13          INC DE
0640' ED 53 11BF' LD (LOW),DE      ; low = i + 1
0644' C3 051A'   JP ST042
;
; *** ST046...pop stack ***
;
0647' 3A 11BD'   ST046: LD A,(BYTE1)    ; pt
064A' 3D         DEC A
064B' C8         RET Z          ; stack empty ! (return to st03$06)
064C' 32 11BD'   LD (BYTE1),A    ; pt
; ST6Y
064F' CD 068E'   CALL POPST      ; pp (low , high) : (de,bc)
0652' ED 43 11C2' LD (HIGH),BC
0656' ED 53 11BF' LD (LOW),DE
065A' C3 051A'   JP ST042
ADDRK: 065D' 1B         DEC DE
065E' CD 0CA3'   CALL MULT      ; (hl) = (de) * (a)
0661' ED 5B 0E7B' LD DE,(KEY)
0665' 19         ADD HL,DE
0666' C9         RET
DCRJ:  0667' 2A 11C6' LD HL,(JJ)
066A' 2B         DEC HL
066B' 22 11C6'   LD (JJ),HL      ; j = j - 1
066E' 2A 11A7'   LD HL,(DMAW)    ; akj
0671' 59         LD E,C          ; key1 still in c
0672' 16 00      LD D,00H
0674' CD 0C80'   CALL SUBDE     ; hl = hl - de
0677' 22 11A7'   LD (DMAW),HL   ; akj
067A' C9         RET
PUSHST: 067B' E3        EX (SP),HL      ; save value
067C' 22 11A3'   LD (DMA0),HL
067F' E1        POP HL        ; delete value in sp
0680' C5        PUSH BC
0681' D5        PUSH DE
0682' 3A 11BD'   LD A,(BYTE1)    ; pt
0685' 3C        INC A
0686' 32 11BD'   LD (BYTE1),A    ; pt
0689' 2A 11A3'   LD HL,(DMA0)
068C' E5        PUSH HL        ; save value
068D' C9        RET
POPST:  068E' E3        EX (SP),HL      ; save value (addr before call)
068F' C1        POP BC        ; delete value in sp
0690' C1        POP BC        ; pop high
0691' D1        POP DE        ; pop low
0692' E5        PUSH HL        ; save value
0693' C9        RET
;
; *****
; * STEP 05 IS ROUTINE TO WRITE KEYFILE1.$$$ FROM MEMORY (AT KEY) *
; *****

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;
0694' 3E 01          ST05: LD A,01H
0696' 32 0E1C'       LD (FCBK1+8),A ; create keyfile1
0699' 11 0E14'       LD DE,FCBK1
069C' CD 0CB7'       CALL CREATEFL ; create keyfile1
069F' 2A 0E7B'       LD HL,(KEY)
06A2' 22 11A5'       LD (DMABF),HL
; recw = (reca * key1) / 128...+1 if sed {} 0
06A5' ED 5B 0E71'   LD DE,(RECA)
06A9' 3A 0E6A'       LD A,(KEYLCM) ; key1
06AC' CD 0CA3'       CALL MULT
06AF' 01 0080        LD BC,128
06B2' CD 0C8B'       CALL DIV
06B5' 7A             LD A,D
06B6' B3             OR E
06B7' 28 15          JR Z,RECW$1
06B9' ED 53 11C6'   LD (JJ),DE ; recw
06BD' 22 11C4'       LD (II),HL ; sed
06C0' 7D             LD A,L
06C1' B4             OR H
06C2' 28 01          JR Z,NOADD
06C4' 13             INC DE
06C5' ED 53 0E73'   NOADD: LD (RECB),DE
06C9' 2A 11A5'       LD HL,(DMABF)
06CC' 18 0E          JR LWRITEK1
06CE' 22 11C4'       RECW$1: LD (II),HL ; sed
06D1' 21 0001        LD HL,1
06D4' 22 11C6'       LD (JJ),HL ; recw = 1
06D7' 2A 11A5'       LD HL,(DMABF)
06DA' 18 1B          JR LWRITEK2
06DC' EB             LWRITEK1: EX DE,HL
06DD' CD 070D'       CALL WRITEK1
06E0' 2A 11A5'       LD HL,(DMABF)
06E3' 11 0080        LD DE,128
06E6' 19             ADD HL,DE
06E7' 22 11A5'       LD (DMABF),HL
06EA' ED 5B 11C6'   LD DE,(JJ) ; recw
06EE' 1B             DEC DE
06EF' ED 53 11C6'   LD (JJ),DE ; recw
06F3' 7A             LD A,D
06F4' B3             OR E
06F5' 20 E5          JR NZ,LWRITEK1
06F7' ED 4B 11C4'   LWRITEK2: LD BC,(II) ; sed
06FB' 54             LD D,H ; save dmabf in de
06FC' 5D             LD E,L
06FD' 09             ADD HL,BC ; dmabf + sed
06FE' 3E 1A          LD A,1AH
0700' 77             LD (HL),A
0701' CD 070D'       CALL WRITEK1
0704' 11 0E14'       LD DE,FCBK1

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0707' CD OCE9'          CALL CLOSEFL      ; close keyfile1
070A' C3 0039'          JP RET$03$06      ; return to st03$06
070B' OE 1A             WRITEK1: LD C,SETDMA   ; set dma at dmabf
070F' CD 0005          CALL BDOS
0712' 11 OE14'          LD DE,FCBK1
0715' CD OCEF'          CALL WRITEFL      ; wrie keyfile1 by fcbk1
0718' C9               RET

;
; *****
; * STEP 06 IS ROUTINE TO MERGE MEMORY BY KEYFILE1.$$$ TO KEYFILE2.$$$ *
; *****
;
; DMAW = A ..... DMABF = B ..... DMAO = C
ST06: LD HL,(RECA)      ; rec in a in physical (key1)
      LD (LOW),HL       ; reca-w
      LD HL,(RECB)      ; rec in b in logical (128)
      LD (JJ),HL        ; recb-w
      LD DE,FCBK1+12
      CALL PCLEARO
      LD DE,FCBK0+12
      CALL PCLEARO
      LD HL,00
      LD (RECB),HL
      LD DE,FCBK1
      CALL OPENFL      ; open keyfile1
      LD DE,FCBK0
      CALL CREATEFL    ; create keyfile2
      LD HL,DMAO
      LD (DMAO),HL     ; dmao = dmako
      LD A,80H
      LD (BYTEMOVE),A  ; bytemove = 128 (bytemove is length of a)
      CALL READB      ; read keyfile1 , bytel = 128
      LD HL,(KEY)
      LD (DMAW),HL     ; dmaw = key
; key1-w-compare = key1 - 3
AVSB: LD A,(BYTE1)
AVSBB: LD BC,(KEYLCM)  ; b = key1wc , c = key1wm
      CP C
      JP C,NEXTREC    ; bytel < key1
      LD HL,(DMABF)
AVSBC: LD A,(HL)
      CP 1AH
      JP Z,EOFB
AVSBA: LD DE,(DMAW)
      LD A,(DE)
LAVSB: SUB (HL)        ; a : b ? (dmaw - dmabf)
      JP C,MOVEA      ; a < b
      JP NZ,MOVEB     ; a > b
      INC HL          ; inc dmabf
      INC DE          ; inc dmaw

```

```

0779' 1A          LD A,(DE)
077A' 10 F4       DJNZ LAVSB
;              JR MOVEA          ; a = b
;
; *** a < b ***
;
077C' 2A 11A7'   MOVEA: LD HL,(DMAW)
077F' CD 07D2'   CALL MOVEO
0782' 22 11A7'   LD (DMAW),HL
0785' 2A 11BF'   LD HL,(LOW)      ; reca-w
0788' 2B         DEC HL
0789' 22 11BF'   LD (LOW),HL     ; reca-w
078C' 7C         LD A,H
078D' 85         OR L
078E' CA 081C'   JP Z,E0FA
0791' ED 4B 0E6A' LD BC,(KEYLCM)  ; b = keylwc , c = keylwm
0795' 2A 11A5'   LD HL,(DMABF)
0798' C3 076B'   JP AVSBA
;
; *** a > b ***
;
079B' 2A 11A5'   MOVEB: LD HL,(DMABF)
079E' CD 07D2'   CALL MOVEO
07A1' 22 11A5'   LD (DMABF),HL
; write keyfile2 at dma1 , bytemove = 128 , dmao = dmao
07A4' 3A 0E6A'   LD A,(KEYLCM)
07A7' 47         LD B,A
07A8' 3A 11BD'   LD A,(BYTE1)
07AB' 90         SUB B
07AC' 32 11BD'   LD (BYTE1),A    ; byte1 = byte1 - keyl
07AF' C3 075A'   JP AVSBB
07B2' 4F         NEXTREC: LD C,A
07B3' 06 00     LD B,0
07B5' C6 80     ADD A,128
07B7' 32 11BD'   LD (BYTE1),A    ; byte1 = 128 + byte1
07BA' 2A 11A5'   LD HL,(DMABF)
07BD' 11 1021'   LD DE,DMAK1
07C0' ED B0     LDIR           ; dmabf --> dma1 (byte1)
07C2' CD 0958'   CALL READREC   ; read keyfile1 at dma1-w
07C5' 21 1021'   LD HL,DMAK1
07C8' 22 11A5'   LD (DMABF),HL
07CB' ED 4B 0E6A' LD BC,(KEYLCM)  ; b = keylwc , c = keylwm
07CF' C3 0765'   JP AVSBC
07D2' ED 5B 11A3' MOVEO: LD DE,(DMAO)
07D6' 3A 11BE'   LD A,(BYTEMOVE) ; keyl still in c
07D9' 47         LD B,A          ; b = bytemove
07DA' 89         CP C           ; bytemove : keylwm ?
07DB' D2 0805'   JP NC,MOVEALL  ; bytemove > = keylwm
07DE' 79         LD A,C           ; bytemove < keylwm
07DF' 90         SUB B

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```

07E0' 32 11C1' LD (KEYLWM),A ; keylwm = keylwm - bytemove
07E3' 48 LD C,B
07E4' 06 00 LD B,0
07E6' ED 80 LDIR ; (dmain) -> (dmao) ...bytemove
07E8' 22 11A9' LD (DMAIN),HL
07EB' CD 0920' CALL WRITEK2
07EE' 47 LD B,A ; bytemove in a = 128
07EF' 3A 11C1' LD A,(KEYLWM)
07F2' 4F LD C,A
07F3' 78 LD A,B
07F4' 91 SUB C
07F5' 32 11BE' LD (BYTEMOVE),A ; bytemove = bytemove - keylwm
07F8' EB EX DE,HL ; dmao
07F9' 2A 11A9' LD HL,(DMAIN)
07FC' 06 00 LD B,0
07FE' ED 80 LDIR ; (dmain) -> (dmao) ...keylwm
0800' ED 53 11A3' LD (DMAO),DE
0804' C9 RET
0805' 91 MOVEALL: SUB C ; bytemove ) = keylwm
0806' 06 00 LD B,0
0808' ED 80 LDIR ; (dmain) -> (dmao)....keylwm
080A' 22 11A9' LD (DMAIN),HL
080D' ED 53 11A3' LD (DMAO),DE
0811' 32 11BE' LD (BYTEMOVE),A ; bytemove = bytemove - keylwm
0814' B7 OR A
0815' CC 0920' CALL Z,WRITEK2 ; bytemove = keylwm
0818' 2A 11A9' LD HL,(DMAIN)
081B' C9 RET
;
; *** eof a ***
;
081C' 2A 11A5' EOFA: LD HL,(DMABF)
081F' ED 58 11A3' WRITEB: LD DE,(DMAO)
0823' 3A 11BE' LD A,(BYTEMOVE)
0826' 47 LD B,A ; bytemove in b
0827' 3A 11BD' LD A,(BYTE1) ; bytel in a
082A' 4F LD C,A ; SAVE bytel in c
082B' 90 SUB B ; bytel - bytemove ?
082C' 38 11 JR C,WRITEB1 ; bytel ( bytemove
082E' 28 29 JR Z,WRITEB2 ; bytel = bytemove
; bytel ) bytemove
; bytel = bytel - bytemove
0830' 32 11BD' LD (BYTE1),A ; bytel = bytel - bytemove
0833' 48 LD C,B
0834' CD 0877' CALL MOVE1 ; dmabf --> dmao (bytemove)
0837' 22 11A5' LD (DMABF),HL
083A' CD 0920' CALL WRITEK2
083D' 18 DD JR EOFA
083F' 78 WRITEB1: LD A,B ; bytel ( bytemove
0840' 91 SUB C
0841' 32 11BE' LD (BYTEMOVE),A ; bytemove = bytemove - bytel

```



```

0844' CD 0877'          CALL MOVE1          ; dmabf --> dmao (byte1)
0847' ED 53 11A3'      LD (DMAO),DE
084B' 2A 11C6'          LD HL,(JJ)
084E' 7C                LD A,H
084F' B5                OR L
0850' CA 08FC'          JP Z,ENDO6
0853' CD 0949'          CALL READB
0856' C3 081F'          JP WRITEB
0859' 06 00             WRITEB2: LD B,0          ; byte1 = bytemove
085B' CD 0877'          CALL MOVE1          ; dmabf -> dmao (byte1)
085E' 11 1121'          LD DE,DMAKO
0861' CD 092A'          LWRITEB2: CALL WRITESEQ
0864' 2A 11C6'          LD HL,(JJ)          ; recw (end b ?)
0867' 7C                LD A,H
0868' B5                OR L
0869' CA 08FC'          JP Z,ENDO6
086C' 11 1021'          LD DE,DMAK1
086F' CD 095B'          CALL READREC
0872' 11 1021'          LD DE,DMAK1
0875' 18 EA             JR LWRITEB2
0877' 7E                MOVE1: LD A,(HL)
0878' FE 1A             CP 1AH
087A' CA 08F4'          JP Z,ENDB
087D' 06 00             LD B,0
087F' ED 80             LDIR
0881' C9                RET

;
; *** eof b ***
;
0882' ED 5B 11BF'      EOFB: LD DE,(LOW)      ; recnow
0886' 3A 0E6A'          LD A,(KEYLCM)
0889' CD 0CA3'          CALL MULT          ; hl = recnow * keyl
088C' 23                INC HL            ; hl = recnow * keyl + 1
088D' 22 11C2'          LD (HIGH),HL      ; recnow * keyl + 1
0890' EB                EX DE,HL          ; save hl in de
0891' 2A 11A7'          LD HL,(DMAW)
0894' 19                ADD HL,DE         ; dmaw = dmaw + (recnow * keyl + 1)
0895' 3E 1A             LD A,1AH
0897' 77                LD (HL),A
0898' EB                EX DE,HL          ; then hl = recnow * keyl + 1
0899' 3A 11BE'          LD A,(BYTEMOVE)
089C' 5F                LD E,A
089D' 16 00             LD D,0
089F' B7                OR A              ; set carry off
08A0' ED 52             SBC HL,DE         ; (recnow * keyl + 1) : bytemove ?
08A2' 28 02             JR Z,WRITEAO     ; (recnow * keyl + 1) = bytemove
08A4' 30 0D             JR NC,WRITEAO    ; (recnow * keyl + 1) > bytemove
08A6' 4B                WRITEAO: LD C,E   ; (recnow * keyl + 1) < bytemove (=)
; e = (bytes in a) and d = 0

08A7' ED 5B 11A3'      LD DE,(DMAO)

```

```

08AB' 2A 11A7' LD HL,(DMAW)
08AE' ED B0 LDIR ; dmaw --> dmao (bytes in a)
08B0' C3 08F6' JP ENDBC
08B3' E5 WRITEA: PUSH HL ; (recnow * key1 + 1 ) > bytemove , save bytes in a
08B4' ED 5B 11A3' LD DE,(DMAO)
08B8' 2A 11A7' LD HL,(DMAW)
08BB' ED B0 LDIR ; dmaw -> dmao (bytemove)
08BD' 22 11A7' LD (DMAW),HL
08C0' CD 092A' CALL WRITESEQ
08C3' E1 POP HL ; bytes in a
; (bytes in a) / 128
08C4' 01 0080 LD BC,128
08C7' CD 0C8B' CALL DIV
08CA' 7C LD A,H
08CB' B5 OR L
08CC' 28 01 JR Z,SEDZ
08CE' 13 INC DE
08CF' ED 53 11C6' SEDZ: LD (JJ),DE ; recw
08D3' ED 5B 11A7' LD DE,(DMAW)
08D7' CD 092A' LWRITEA: CALL WRITESEQ ; write keyfile2 at dmabf
08DA' ED 4B 11C6' LD BC,(JJ) ; recw
08DE' 0B DEC BC
08DF' ED 43 11C6' LD (JJ),BC ; recw
08E3' 78 LD A,B
08E4' B1 OR C
08E5' 28 15 JR Z,ENDO6
08E7' 2A 11A7' LD HL,(DMAW) ; dmaw
08EA' 11 0080 LD DE,128
08ED' 19 ADD HL,DE
08EE' 22 11A7' LD (DMAW), HL ; dmaw = dmaw + 128
08F1' EB EX DE,HL
08F2' 18 E3 JR LWRITEA
08F4' E1 ENDB: POP HL ; delete sp from call
08F5' 12 LD (DE),A
08F6' 11 1121' ENDBC: LD DE,DMAO
08F9' CD 092A' CALL WRITESEQ
08FC' 11 0E38' ENDO6: LD DE,FCBK0
08FF' CD 0CE9' CALL CLOSEFL ; close keyfile2
0902' 11 0E14' LD DE,FCBK1
0905' 0E 13 LD C,DELETF
0907' CD 0005 CALL BDOS ; delete keyfile1
090A' 11 0E48' LD DE,FCBK0+16
090D' 21 0E14' LD HL,FCBK1
0910' 01 000C LD BC,12
0913' ED B0 LDIR
0915' 0E 17 LD C,RENAMEF
0917' 11 0E38' LD DE,FCBK0
091A' CD 0CFD' CALL BDOSNF ; rename keyfile1 = keyfile2
091D' C3 0039' JP RET$03$06 ; return to st03$06
0920' 11 1121' WRITEK2: LD DE,DMAO

```

```

0923' CD 092A'      CALL WRITESEQ
0926' CD 093D'      CALL INITWRTE
0929' C9            RET
092A' 0E 1A        WRITESEQ: LD C,SETDMA
092C' CD 0005      CALL BDOS
092F' 11 0E38'     LD DE,FCBKO
0932' CD 0CEF'     CALL WRITEFL
0935' 2A 0E73'     LD HL,(RECB)
0938' 23           INC HL           ; recb = recb + 1
0939' 22 0E73'     LD (RECB),HL
093C' C9            RET
093D' 21 1121'     INITWRTE: LD HL,DMAKO
0940' 22 11A3'     LD (DMAO),HL       ; dmao = dmao
0943' 3E 80        LD A,128
0945' 32 11BE'     LD (BYTEMOVE),A
0948' C9            RET
0949' 11 1021'     READB:  LD DE,DMAK1
094C' CD 095B'     CALL READREC
094F' 21 1021'     LD HL,DMAK1
0952' 22 11A5'     LD (DMABF),HL
0955' 3E 80        LD A,128
0957' 32 11BD'     LD (BYTE1),A
095A' C9            RET
095B' 0E 1A        READREC: LD C,SETDMA
095D' CD 0005      CALL BDOS
0960' 0E 14        LD C,READS
0962' 11 0E14'     LD DE,FCBK1
0965' CD 0005      CALL BDOS
0968' 2A 11C6'     LD HL,(JJ)         ; recw
096B' 2B           DEC HL
096C' 22 11C6'     LD (JJ),HL        ; recw
096F' C9            RET

```

```

;
; *****
; *           ST07 - ST08           *
; *****
;
; *****
; * STEP 07 IS ROUTINE TO WRITE SUBKEY FROM KEYFILE1.*** TO MEMORY AT KEY *
; * KEYFILE1.*** USE FCBK1 AT DMAK1 *
; *****
;
; free : (allrec * 3) + 2

```

```

0970' ED 5B 0E75' ST07:  LD DE,(ALLREC)
0974' 3E 03        LD A,03H
0976' CD 0CA3'     CALL MULT
0979' 11 0002      LD DE,0002H
097C' 19           ADD HL,DE
097D' ED 5B 0E79' LD DE,(FREE)
0981' EB           EX DE,HL

```



```

0982' B7 OR A ; set carry off
0983' ED 52 SBC HL,DE
0985' DA 0D10' JP C,ERRSPC
0988' 11 0E20' LD DE,FCBK1+12
0988' CD 0C6E' CALL PCLEARO
098E' 11 0E14' LD DE,FCBK1
0991' CD 0CC1' CALL OPENFL ; open keyfile1
0994' 11 1021' LD DE,DMAK1
0997' 0E 1A LD C,SETDMA ; set dma at dmak1 for keyfile1
0999' CD 0005 CALL BDOS
099C' ED 5B 0E7B' LD DE,(KEY)
09A0' 3E FF LD A,OFFH
09A2' 12 LD (DE),A
09A3' 13 INC DE
09A4' CD 0A27' LST07: CALL READKEY
09A7' 3E 80 LD A,128
09A9' 32 11BC' LD (BYTEI),A
09AC' 7E BVSKC: LD A,(HL)
09AD' FE 1A CP 1AH
09AF' CA 0A36' JP Z,ENDSTO7
09B2' ED 4B 0E6A' LD BC,(KEYLCH)
09B6' 3A 11BC' LD A,(BYTEI)
09B9' 90 SUB B ; bytei : keylwc ?
09BA' CA 09F2' JP Z,BEQKC ; bytei = keylwc
09BD' DA 0A04' JP C,BLEKC ; bytei < keylwc
09C0' 4F LD C,A
09C1' D6 03 SUB 3
09C3' 38 0F JR C,BLEK ; bytei < keyl
09C5' 32 11BC' LD (BYTEI),A ; bytei ) = keyl
09C8' CD 0A1D' CALL MOVE3
09CB' 3A 11BC' LD A,(BYTEI)
09CE' B7 OR A
09CF' 28 D3 JR Z,LST07
09D1' C3 09AC' JP BVSKC
09D4' 3E 03 BLEK: LD A,3
09D6' 91 SUB C
09D7' F5 PUSH AF ; a = bytemove
09D8' 79 LD A,C
09D9' 48 LD C,B
09DA' 06 00 LD B,00
09DC' 09 ADD HL,BC
09DD' 4F LD C,A
09DE' ED B0 LDIR ; dmabf -> dmaw (bytemove)
09E0' CD 0A27' CALL READKEY
09E3' C1 POP BC ; b = bytemove
09E4' 3E 80 LD A,128
09E6' 90 SUB B
09E7' 32 11BC' LD (BYTEI),A
09EA' 48 LD C,B
09EB' 06 00 LD B,0

```

```

09ED' ED 80          LDIR
09EF' C3 09AC'      JP  BVSKC
09F2' CD 0A27'      BEQKC: CALL READKEY
09F5' 3E 80         LD  A,128
09F7' D6 03         SUB  3
09F9' 32 11BC'      LD  (BYTEI),A
09FC' 01 0003      LD  BC,3
09FF' ED 80          LDIR
0A01' C3 09AC'      JP  BVSKC
0A04' 3A 11BC'      BLEKC: LD  A,(BYTEI)
0A07' 4F           LD  C,A
0A08' 78           LD  A,B
0A09' 91           SUB  C           ; keylwc = keylwc - bytei
0A0A' F5           PUSH AF        ; a = bytemove
0A0B' CD 0A27'      CALL READKEY
0A0E' C1           POP  BC         ; b = bytemove
0A0F' 3E 80         LD  A,128
0A11' 90           SUB  B
0A12' D6 03         SUB  3
0A14' 32 11BC'      LD  (BYTEI),A
0A17' CD 0A1D'      CALL MOVE3
0A1A' C3 09AC'      JP  BVSKC
0A1D' 48           MOVE3: LD  C,B
0A1E' 06 00         LD  B,00
0A20' 09           ADD  HL,BC
0A21' 01 0003      LD  BC,03
0A24' ED 80          LDIR
0A26' C9           RET
0A27' D5           READKEY: PUSH DE      ; dmaw
0A28' 11 0E14'      LD  DE,FCBK1
0A2B' CD 0BAC'      CALL READIS
0A2E' 21 1021'      LD  HL,DMAK1
0A31' 22 11A5'      LD  (DMABF),HL ; dmabf = dmak1
0A34' D1           POP  DE         ; dmabf
0A35' C9           RET
0A36' 3E FF        ENDST07: LD  A,OFFH
0A38' 12           LD  (DE),A
0A39' ED 53 11A1'   LD  (DMABEG),DE ; key at bottom
0A3D' 11 0E14'      LD  DE,FCBK1
0A40' 0E 13         LD  C,DELETEF
0A42' CD 0005      CALL BDOS      ; delete keyfile1
;
; *****
; * STEP 08 IS ROUTINE TO CREATE OUTPUT FROM INPUT BY* PATTERN IN MEMORY *
; *****
;
0A45' CD 25C3      ST08:  CALL 25C3H      ; HOME
0A48' 3E 0A         LD  A,10
0A4A' CD 255E      CALL 255EH      ; line 11
0A4D' 3E 15         LD  A,21

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0A4F' CD 25B5          CALL 25B5H          ; col 22
0A52' 11 0D98'        LD DE,PUTDSKO
0A55' CD 0C7C'        CALL MSGPRT        ; msg to put output diskette
0A58' 3A 0E5C'        LD A,(NAMEO)
0A5B' C6 40           ADD A,40H
0A5D' CD 0C76'        CALL MSGDR
0A60' CD 0C36'        CALL MSG$OPENI
0A63' 11 0E44'        LD DE,FCBKO+12
0A66' CD 0C6E'        CALL PCLEARO
0A69' 21 0000         LD HL,0
0A6C' 22 0E77'        LD (RECNO),HL
0A6F' 11 0E38'        LD DE,FCBKO
0A72' 21 0E5C'        LD HL,NAMEO
0A75' 01 000C         LD BC,12
0A78' ED B0           LDIR              ; fcbko = nameo
0A7A' 11 0E38'        LD DE,FCBKO
0A7D' 0E 13           LD C,DELETEF
0A7F' CD 0005         CALL BDOS
0A82' 11 0E38'        LD DE,FCBKO
0A85' CD 0CB7'        CALL CREATEFL
0A88' 21 1121'        LD HL,DMAKO
0A8B' 22 11A3'        LD (DMAO),HL
0A8E' 3E 80           LD A,128
0A90' 32 11BE'        LD (BYTEMOVE),A ; bytemove = 128
; if directory full ...msg for new diskette...jmp to st08
0A93' 3A 0E69'        LD A,(STYPE)
0A96' FE 44           CP 44H
0A98' 28 0B           JR Z,ST08D
0A9A' FE 41           CP 41H
0A9C' C2 0D14'        JP NZ,INTERR ; internal error
0A9F' 2A 0E7B'        ST08A: LD HL,(KEY)
0AA2' 23             INC HL
0AA3' 18 06           JR ST08C
0AA5' 2A 11A1'        ST08D: LD HL,(DMABEG) ; get key at bottom
0AA8' 2B             DEC HL
0AA9' 2B             DEC HL
0AAA' 2B             DEC HL
0AAB' 3A 0E68'        ST08C: LD A,(FTYPE)
0AAE' FE 52           CP 52H
0AB0' CA 0AE6'        JP Z,PST08R
0AB3' FE 53           CP 53H
0AB5' C2 0D14'        JP NZ,INTERR
;
; *** output..seq ***
;
0AB8' 3E 00           ST08S: LD A,0
0ABA' 32 11C8'        LD (SAVE),A ; count ret
0ABD' CD 0B25'        CALL ST08INIT
0ACO' ED 5B 11A3'     LD DE,(DMAO)
0AC4' 7E             LST08S: LD A,(HL)

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OAC5' FE 0A          CP 0AH
OAC7' 28 0D          JR Z,ENDRECS
OAC9' 12             LD (DE),A
OACA' 23             INC HL
OACB' 13             INC DE
OACC' 05             DEC B           ; bytei still infb8
OACD' CC 0B95'      CALL Z,READNEXT
OADO' 0D             CHKBYTEM: DEC C
OAD1' CC 0BC3'      CALL Z,PWRITE0
OAD4' 18 EE          JR LST08S
OAD6' 12             ENDRECS: LD (DE),A
OAD7' 13             INC DE
OAD8' 0D             DEC C
OAD9' 79             LD A,C
OADA' 32 11BE'      LD (BYTEMOVE),A
OADD' CC 0BDD'      CALL Z,PWRITE01
OAE0' CD 0B4F'      CALL NEXTKEY
OAE3' C3 0AB8'      JP ST08S

;
; *** output..rnd ***
;
OAE6' 3A 0E6F'      PST08R: LD A,(RECL)
OAE9' 6F             LD L,A
OAEA' 26 00          LD H,0
OAE C' 23             INC HL
OAE D' 22 0E6F'      LD (RECL),HL
OAF0' 2A 0E6F'      ST08R: LD HL,(RECL)
OAF3' 22 11BD'      LD (BYTE1),HL ; reqlw
OAF6' CD 0B25'      CALL ST08INIT
OAF9' ED 5B 11A3'   LD DE,(DMA0)
OAFD' 3E 00          LST08R: LD A,0
OAF F' 32 11C8'      LD (SAVE),A ; count ret
OB02' 7E             LD A,(HL)
OB03' 12             LD (DE),A
OB04' 13             INC DE
OB05' 23             INC HL
OB06' 0D             DEC C           ; bytemove
OB07' CC 0BC3'      CALL Z,PWRITE0
OB0A' ED 5B 11BD'   LD DE,(BYTE1) ; reqlw
OB0E' 1B             DEC DE
OB0F' ED 53 11BD'   LD (BYTE1),DE ; reqlw
OB13' 28 06          JR Z,ENDRECR
OB15' 05             DEC B           ; bytei
OB16' CC 0B95'      CALL Z,READNEXT
OB19' 18 E2          JR LST08R
OB1B' 79             ENDRECR: LD A,C
OB1C' 32 11BE'      LD (BYTEMOVE),A
OB1F' CD 0B4F'      CALL NEXTKEY
OB22' C3 0AF0'      JP ST08R
OB25' 22 11A7'      ST08INIT: LD (DMAW),HL

```

```

0B28' 7E          LD  A,(HL)
0B29' 32 0E6E'   LD  (SUBREC),A
0B2C' 23          INC  HL
0B2D' 7E          LD  A,(HL)
0B2E' 32 0E9E'   LD  (FCBKI+33),A
0B31' 23          INC  HL
0B32' 7E          LD  A,(HL)
0B33' 32 0E9F'   LD  (FCBKI+34),A
0B36' CD 0BB2'   CALL READIR
0B39' 3A 0E6E'   LD  A,(SUBREC)
0B3C' 5F          LD  E,A
0B3D' 3E 80      LD  A,128
0B3F' 93          SUB  E
0B40' 47          LD  B,A          ; byte in b = 128 - subrec
0B41' 16 00      LD  D,00
0B43' 21 0EA1'   LD  HL,DMAKI
0B46' 19          ADD  HL,DE
0B47' 22 11A5'   LD  (DMABF),HL   ; dmabf = dmabf + subrec
0B4A' 3A 11BE'   LD  A,(BYTEMOVE)
0B4D' 4F          LD  C,A
0B4E' C9          RET
0B4F' ED 53 11A3' NEXTKEY: LD  (DMA0),DE
0B53' 2A 0E77'   LD  HL,(RECNO)
0B56' 23          INC  HL
0B57' 22 0E77'   LD  (RECNO),HL
0B5A' 2A 11A7'   LD  HL,(DMAW)   ; keyw
0B5D' 3A 0E69'   LD  A,(STYPE)
0B60' FE 41      CP  41H
0B62' 28 09      JR  Z,ST08UPK
                ; ST08 DOWNK
0B64' 2B          DEC  HL
0B65' 7E          LD  A,(HL)
0B66' FE FF      CP  OFFH
0B68' 28 0A      JR  Z,E0F08
0B6A' 2B          DEC  HL
0B6B' 2B          DEC  HL
0B6C' C9          RET
0B6D' 23          ST08UPK: INC  HL
0B6E' 23          INC  HL
0B6F' 23          INC  HL
0B70' 7E          LD  A,(HL)
0B71' FE FF      CP  OFFH
0B73' C0          RET  NZ
0B74' D1          E0F08: POP  DE          ; delete sp from call
0B75' ED 5B 11A3' LD  DE,(DMA0)
0B79' 3E 1A      LD  A,1AH
0B7B' 12          LD  (DE),A
0B7C' CD 0BF8'   CALL WRITE0
                ; do not close input
0B7F' 11 0E38'   LD  DE,FCBK0

```



ศูนย์วิจัยทางการแพทย์
 ภาควิชาการพยาบาล
 วิทยาลัยพยาบาลบรมราชชนนีสกลนคร


```

0B82' CD 0CE9'          CALL CLOSEFL      ; close output
0B85' ED 5B 0E75'      LD DE,(ALLREC)
0B89' 2A 0E77'          LD HL,(RECNO)
0B8C' B7                OR A              ; set carry off
0B8D' ED 52             SBC HL,DE
0B8F' C2 0D14'          JP NZ,INTERR
0B92' C3 0010'          JP STOP           ; return to main
0B95' D5                READNEXT: PUSH DE  ; dmao
0B96' C5                PUSH BC          ; c = bytemove
0B97' 2A 0E9E'          LD HL,(FCBKI+33)
0B9A' 23                INC HL
0B9B' 22 0E9E'          LD (FCBKI+33),HL
0B9E' CD 0BB2'          CALL READIR
0BA1' C1                POP BC           ; c = bytemove
0BA2' 06 80             LD B,128
0BA4' D1                POP DE          ; dmao
0BA5' 21 0EA1'          LD HL,DMAKI
0BA8' 22 11A5'          LD (DMABF),HL
0BAB' C9                RET
0BAC' 0E 14             READIS: LD C,READS
0BAE' CD 0005           CALL BDOS
0BB1' C9                RET
0BB2' 11 0EA1'          READIR: LD DE,DMAKI
0BB5' 0E 1A             LD C,SETDMA
0BB7' CD 0005           CALL BDOS
0BBA' 0E 21             LD C,READR
0BBC' 11 0E7D'          LD DE,FCBKI
0BBF' CD 0005           CALL BDOS
0BC2' C9                RET
0BC3' CD 0BEC'          PWRITE0: CALL COUNTRET
0BC6' 22 11A5'          LD (DMABF),HL   ; dmabf
0BC9' 78                LD A,B
0BCA' 32 11BC'          LD (BYTEI),A    ; b = bytei
0BCD' CD 0BDD'          CALL PWRITE01
0BD0' 4F                LD C,A
0BD1' 3A 11BC'          LD A,(BYTEI)
0BD4' 47                LD B,A
0BD5' ED 53 11A3'       LD (DMAO),DE
0BD9' 2A 11A5'          LD HL,(DMABF)   ; dmabf
0BDC' C9                RET
0BDD' CD 0BEC'          PWRITE01: CALL COUNTRET
0BE0' CD 0BF8'          CALL WRITE0
0BE3' 3E 80             LD A,128
0BE5' 32 11BE'          LD (BYTEMOVE),A
0BE8' 11 1121'          LD DE,DMAKO
0BEB' C9                RET
0BEC' 3A 11C8'          COUNTRET: LD A,(SAVE) ; countret
0BEF' 3C                INC A
0BF0' B7                OR A
0BF1' CA 0D14'          JP Z,INTERR     ; over 255 times

```

```

0BF4' 32 11C8' LD (SAVE),A ; countret
0BF7' C9 RET
0BF8' CD 0BEC' WRITE0: CALL COUNTRET
0BFB' 11 1121' LD DE,DMAKO
0BFE' 0E 1A LD C,SETDMA
0C00' CD 0005 CALL BDOS
0C03' 0E 15 LD C,WRITES
0C05' 11 0E38' LD DE,FCBKO
0C08' CD 0005 CALL BDOS
0C0B' B7 OR A
0C0C' C8 RET Z
; diskfull ...writeout or not if 'y' ..jmp to st08 ..if 'n' cancel
0C0D' 3A 11C8' LD A,(SAVE) ; countret
0C10' 47 LD B,A
0C11' D1 LPOP: POP DE ;delete sp from call
0C12' 10 FD DJNZ LPOP
0C14' 3E 0D LASKFORC: LD A,13
0C16' CD 255E CALL 255EH ; line 14
0C19' 3E 06 LD A,6
0C1B' CD 25B5 CALL 25B5H ; col 7
0C1E' 11 0DD1' LD DE,ASKNEXT
0C21' CD 0C7C' CALL MSGPRT
0C24' CD 0C82' CALL MSGCONI
0C27' 3A 11B9' LD A,(CONBF+2)
0C2A' FE 59 CP 59H ; y
0C2C' CA 0A45' JP Z,ST08
0C2F' FE 4E CP 4EH ; n
0C31' CA 0010' JP Z,STOP ; return to main
0C34' 18 DE JR LASKFORC
MSG$OPENI: LD A,14
0C36' 3E 0E CALL 255EH ; line 15
0C38' CD 255E LD A,30
0C3B' 3E 1E CALL 25B5H ; col 31
0C3D' CD 25B5 LD DE,CRMMSG
0C40' 11 0DBF' CALL MSGPRT ; msg press enter
0C43' CD 0C7C' CALL MSGCONI
0C46' CD 0C82' LD C,RESETDSK
0C49' 0E 0D CALL BDOS ; reset disk
0C4B' CD 0005 CALL 25C3H ; home
0C4E' CD 25C3 LD A,11
0C51' 3E 0B CALL 255EH ; line 12
0C53' CD 255E LD A,35
0C56' 3E 23 CALL 25B5H ; col 36
0C58' CD 25B5 LD DE,MSGSORT
0C5B' 11 0E09' CALL MSGPRT
0C5E' CD 0C7C' LD DE,FCBKI+12
0C61' 11 0E89' CALL PCLEAR0
0C64' CD 0C6E' LD DE,FCBKI
0C67' 11 0E7D' CALL OPENFL ; open input
0C6A' CD 0CC1' RET
0C6D' C9

```

0C6E'	06 18	PCLEARO:	LD B,24	
0C70'	AF	CLEARO:	XOR A	
0C71'	12	LCLEARO:	LD (DE),A	; clear value to be "0"
0C72'	13		INC DE	
0C73'	10 FC		DJNZ LCLEARO	
0C75'	C9		RET	
0C76'	32 0DBC'	MSGDR:	LD (DRMSG),A	
0C79'	11 0DBC'		LD DE,DRMSG	
0C7C'	0E 09	MSGPRT:	LD C,PRTSTR	
0C7E'	CD 0005		CALL BDOS	
0C81'	C9		RET	
0C82'	11 11B7'	MSGCONI:	LD DE,CONBF	
0C85'	0E 0A		LD C,READCONS	
0C87'	CD 0005		CALL BDOS	
0C8A'	C9		RET	
0C8B'	11 0001	DIV:	LD DE,01	; de = hl / bc ...sed in hl
0C8E'	B7		OR A	; set carry = 0
0C8F'	ED 42	LDIV:	SBC HL,BC	
0C91'	C8		RET Z	
0C92'	38 03		JR C,DIV1	
0C94'	13		INC DE	
0C95'	18 F8		JR LDIV	
0C97'	3E FF	DIV1:	LD A,OFFH	; bc - (ffff - (hl) + 1)
0C99'	95		SUB L	
0C9A'	3C		INC A	
0C9B'	47		LD B,A	
0C9C'	79		LD A,C	
0C9D'	90		SUB B	
0C9E'	6F		LD L,A	
0C9F'	26 00		LD H,00	
OCA1'	1B		DEC DE	
OCA2'	C9		RET	
OCA3'	06 08	MULT:	LD B,08	; b = counter
OCA5'	21 0000		LD HL,0000	; hl = de * a
OCA8'	29	MULT1:	ADD HL,HL	
OCA9'	17		RLA	
OCAA'	30 01		JR NC,MULT2	
OCAE'	19		ADD HL,DE	
OCAE'	10 F9	MULT2:	DJNZ MULT1	
OCAF'	C9		RET	
OCB0'	7D	SUBDE:	LD A,L	; hl - de
OCB1'	93		SUB E	
OCB2'	6F		LD L,A	
OCB3'	7C		LD A,H	
OCB4'	9A		SBC A,D	
OCB5'	67		LD H,A	
OCB6'	C9		RET	
OCB7'	0E 16	CREATEFL:	LD C,CREATEF	
OCB9'	CD 0005		CALL BDOS	
OCBC'	3C		INC A	

```

OCBD' CA OCF6'          JP  Z,DISKFULL    ; directory full
OCCO'  C9                RET
OCC1'  0E 0F            OPENFL: LD  C,OPENF
OCC3'  CD OCFD'         CALL BDOSNF
OCC6'  C9                RET
OCC7'  11 11A2'        DELKEY: LD  DE,DMABEG+1
OCCA'  3E 3F            LD  A,3FH
OCCC'  06 08            LD  B,8
OCCE'  12                LDELKEY: LD (DE),A
OCCF'  13                INC  DE
OCDO'  10 FC            DJNZ LDELKEY
OCD2'  21 0E1D'        LD  HL,FCBK1+9
OCD5'  01 0003         LD  BC,3
OCD8'  ED B0            LDIR
OCDA'  3A 0E14'        LD  A,(FCBK1)
OCDD'  32 11A1'        LD  (DMABEG),A
OCEO'  11 11A1'        LD  DE,DMABEG
OCE3'  0E 13            LD  C,DELETEF
OCE5'  CD 0005         CALL BDOS
OCE8'  C9                RET
OCE9'  0E 10            CLOSEFL: LD C,CLOSEF
OCEB'  CD OCFD'         CALL BDOSNF
OCEE'  C9                RET
OCEF'  0E 15            WRITEFL: LD C,WRITES
OCF1'  CD 0005         CALL BDOS
OCF4'  B7                OR  A
OCF5'  C8                RET  Z
OCF6'  CD OCC7'        DISKFULL: CALL DELKEY
OCF9'  1E 3D            LD  E,3DH    ; disk full
OCFB'  18 1C            JR  ERR
OCFD'  CD 0005         BDOSNF: CALL BDOS
OD00'  3C                INC  A
OD01'  C0                RET  NZ
OD02'  CD OCC7'        NOTFOUND: CALL DELKEY
OD05'  1E 35            LD  E,35H    ; file not found
OD07'  18 10            JR  ERR
OD09'  CD OCC7'        PSYNERR: CALL DELKEY
ODOC'  1E 05            SYNERR: LD  E,05H ; illegal function call
ODOE'  18 09            JR  ERR
OD10'  1E 07            ERRSPC: LD  E,07H ; out of memory
OD12'  18 05            JR  ERR
OD14'  CD OCC7'        INTERR: CALL DELKEY
OD17'  1E 33            LD  E,33H    ; internal error
OD19'  D5                ERR:  PUSH DE
OD1A'  CD 0015'        CALL CLEARF
OD1D'  D1                POP  DE
OD1E'  C3 0D94         JP  0D94H
OD21'  50 55 54 20     PUTDSKI: DEFB 'PUT INPUT DISKETTE INTO DRIVE $'
OD25'  49 4E 50 55
OD29'  54 20 44 49

```



OD2D' 53 48 45 54
 OD31' 54 45 20 49
 OD35' 4E 54 4F 20
 OD39' 44 52 49 56
 OD3D' 45 20 24
 OD40' 50 55 54 20
 OD44' 41 56 41 49
 OD48' 4C 41 42 4C
 OD4C' 45 20 44 49
 OD50' 53 48 45 54
 OD54' 54 45 20 46
 OD58' 4F 52 20 57
 OD5C' 4F 52 48 20
 OD60' 41 52 45 41
 OD64' 20 49 4E 54
 OD68' 4F 20 44 52
 OD6C' 49 56 45 20
 OD70' 24
 OD71' 28 4F 55 47
 OD75' 48 54 20 54
 OD79' 4F 20 42 45
 OD7D' 20 46 4F 52
 OD81' 4D 41 54 54
 OD85' 45 44 20 42
 OD89' 4C 41 4E 48
 OD8D' 20 44 49 53
 OD91' 48 45 54 54
 OD95' 45 29 24
 OD98' 50 55 54 20
 OD9C' 44 49 53 48
 ODA0' 45 54 54 45
 ODA4' 20 46 4F 52
 ODA8' 20 4F 55 54
 ODAC' 50 55 54 20
 ODB0' 49 4E 54 4F
 ODB4' 20 44 52 49
 ODB8' 56 45 20 24
 ODBC' 30 3A 24
 ODBF' 54 48 45 4E
 ODC3' 20 50 52 45
 ODC7' 53 53 20 45
 ODCB' 4E 54 45 52
 ODCF' 20 24
 ODD1' 44 49 53 48
 ODD5' 20 46 55 4C
 ODD9' 4C 2E 2E 2E
 ODDD' 20 44 4F 20
 ODE1' 59 4F 55 20
 ODE5' 53 54 49 4C
 ODE9' 4C 20 57 41

PUTDSKW: DEFB 'PUT AVAILABLE DISKETTE FOR WORK AREA INTO DRIVE \$'

PUTDSKWC: DEFB '(OUGHT TO BE FORMATTED BLANK DISKETTE)\$'

PUTDSKO: DEFB 'PUT DISKETTE FOR OUTPUT INTO DRIVE \$'

DRMSG: DEFB 'O:\$'
 CRMSG: DEFB 'THEN PRESS ENTER \$'

ASKNEXT: DEFB 'DISK FULL... DO YOU STILL WANT TO WRITE OUTPUT ? (Y/N) \$'



```
ODED' 4E 54 20 54
ODF1' 4F 20 57 52
ODF5' 49 54 45 20
ODF9' 4F 55 54 50
ODFD' 55 54 20 3F
OE01' 20 28 59 2F
OE05' 4E 29 20 24
OE09' 53 4F 52 54
OE0D' 49 4E 47 2E
OE11' 2E 2E 24
OE14' 44 4B 45 56
OE18' 46 49 4C 45
OE1C' 30 24 24 24
OE20'
OE38'

MSGSORT: DEFB 'SORTING...$'

FCBK1: DEFB 'DKEYFILE0$$$' ; keyfile1

FCBK0: DEFS 24
DEFS 36 ; keyfile2 in st06
; output in st08

NAME0: DEFS 12
FTYPE: DEFS 1
STYPE: DEFS 1
KEYLCM: DEFS 2
REC: DEFS 2 ; save
SUBREC: DEFS 1 ; save
RECL: DEFS 2 ; not change
RECA: DEFS 2 ; rec in memory in sorting use in st03, st04,
; st05, st06
RECB: DEFS 2 ; rec in keyfile1 in logical (128)
ALLREC: DEFS 2 ; rec-in to sort from st01-st08
RECNO: DEFS 2 ; (max) recs in memory in physical (key1)
; use in st02 (save) , st03
; rec-out to write-out in st08

FREE: DEFS 2 ; save
KEY: DEFS 2 ; save
FCBK1: DEFS 36 ; name-in
DMAKI: DEFS 384
DMAKI: DEFS 256
DMAKO: DEFS 128 ; dmako , kref in st04
DMABEG: DEFS 2 ; work in st03 , key-at-bottom in st07
DMAO: DEFS 2 ; dmaend in st03
; dma-work in st06 st08
DMABF: DEFS 2 ; dma-work for rec that read
; aki in st04
DMAW: DEFS 2 ; dma-work for rec in memory
; akj in st04
DMAIN: DEFS 2 ; in st06
EOFI: DEFS 1 ; save for la or not
AKEYLEN: DEFS 2 ; keylenw (addr of keylen) in st01 , st03
; asave in st05 , st06
KEYLEN: DEFS 9 ; key and length of that key
; use in st01 , st03
CONBF: DEFS 5
```

```
OE79'
OE7B'
OE7D'
OEAI'
I021'
1121'
11A1'
11A3'
11A5'
11A7'
11A9'
11AB'
11AC'
11AE'
11B7'
```

```

11BC'      BYTEI:  DEFS 1      ; save for bytes of dmaki in st03-st06 , st08
11BD'      BYTEI:  DEFS 1      ; byte for dmakl in st06 , st07
                                     ; pt in st04
11BE'      BYTEMOVE: DEFS 1    ; reclw (r) in st03 , st08
                                     ; byte for dmakl in st05
                                     ; dmako in st06 , st08
11BF'      LOW:     DEFS 2     ; low in st04
11C1'      KEYLWM:  DEFS 1     ; keylwm in st06
11C2'      HIGH:   DEFS 2     ; high in
                                     ; recnow in st03, st06
11C4'      II:     DEFS 2     ; i in st04
                                     ; sed in st03 , st05 , st06
11C6'      JJ:     DEFS 2     ; keylw in st07
11C8'      SAVE:   DEFS 1     ; j in st04
                                     ; save in st05 , st06
                                     ; len in st03
END

```



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

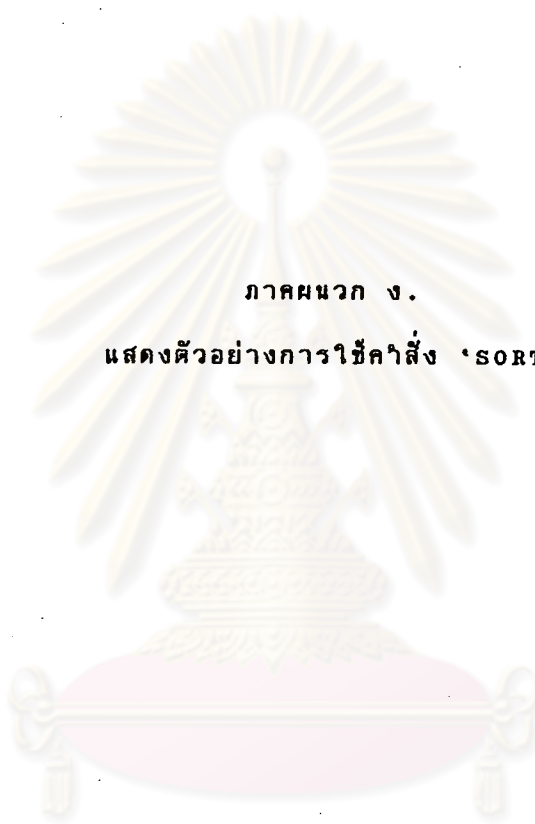
Macros:

Symbols:

065D'	ADDRK	11AC'	AKEYLEN	0E75'	ALLREC
0DD1'	ASKNEXT	0757'	AVS8	076B'	AVSBA
075A'	AVSBB	0765'	AVSBC	0005	BDOS
0CFD'	BDOSNF	09F2'	BEQKC	0221'	BLANK
09D4'	BLEK	0A04'	BLEKC	09AC'	BVSKC
11BD'	BYTE1	11BC'	BYTEI	11BE'	BYTEMOVE
0132'	CHECKKL	0156'	CHECKNUM	0ADO'	CHKBYTEM
0081'	CHKDRI	00C5'	CHKDRO	01F1'	CHKDUP
0209'	CHKDUPC	04BB'	CHKEOF	0379'	CHKLEN
0C70'	CLEARO	0015'	CLEARF	0010	CLOSEF
0CE9'	CLOSEFL	11B7'	CONBF	0002	CONSOUT
007E'	CONT	0BEC'	COUNTRET	0016	CREATEF
0CB7'	CREATEFL	0DBF'	CRMSG	0667'	DCRJ
0013	DELETEF	0CC7'	DELKEY	0CF6'	DISKFULL
0C8B'	DIV	0C97'	DIV1	11A1'	DMABEG
11A5'	DMABF	11A9'	DMAIN	1021'	DMAK1
0EA1'	DMAK1	1121'	DMAKO	11A3'	DMAO
11A7'	DMAW	0076'	DRA	006C'	DRB
0090'	DRIOK	0DBC'	DRMSG	00D0'	DROOK
009A'	DRW	08FC'	END06	08F4'	ENDB
08F6'	ENDBC	01DA'	ENDING	01E2'	ENDINGOK
041B'	ENDLOGR	0407'	ENDLOGRC	0415'	ENDLOGRZ
0314'	ENDLOGS	0B1B'	ENDRECR	0AD6'	ENDRECS
04D4'	ENDST03	0A36'	ENDST07	0B74'	EOF08
081C'	EOFA	0882'	EOFB	11AB'	EOFI
0D19'	ERR	008B'	ERRDR	019E'	ERRFN
0227'	ERRLEN	0D10'	ERRSPC	0045'	ERRTYPE
0E14'	FCBK1	0E7D'	FCBK1	0E38'	FCBK0
0E79'	FREE	004A'	FTOK	0E68'	FTYPE
0211'	GE255	11C2'	HIGH	11C4'	II
093D'	INITWRTE	034B'	INRF	035B'	INRFSTOP
0D14'	INTERR	013F'	INXH	11C6'	JJ
0361'	KEQF	0E7B'	KEY	01AD'	KEYEND
0E6A'	KEYLCM	11AE'	KEYLEN	11C1'	KEYLWM
0342'	KGTF	033C'	KLTF	0428'	KVSFR
0324'	KVSFS	0160'	L010	0165'	L011
017B'	L011C	0180'	L012	0183'	L013
0185'	L014	0194'	L015	0199'	L016
01A3'	L017	0C14'	LASKFORC	0770'	LAVSB
0220'	LBLANK	01F6'	LCHKDUP	0C71'	LCLEARO
001E'	LCLEARF	049C'	LDADMA	0CCE'	LDELKEY
0C8F'	LDIV	01FC'	LDUP	04F2'	LEOFI
04EC'	LEOFI\$POP	04EF'	LEOFIO	034E'	LINRF
036A'	LKEQF	0341'	LKGTF	042C'	LKVSFR
032B'	LKVSFS	03DD'	LLOGRECR	0304'	LLOGRECS
0003'	LMAIN	03D0'	LOGRECR	02FD'	LOGRECS
0100'	LOOPKL	11BF'	LOW	0C11'	LPOP

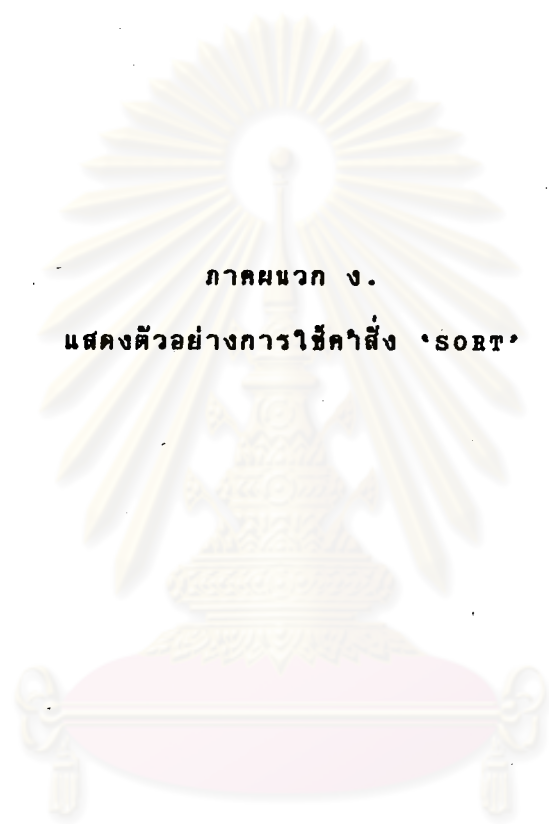
09A4'	LST07	0AFD'	LST08R	0AC4'	LST08S
08D7'	LWRITEA	0861'	LWRITEB2	06DC'	LWRITEK1
06F7'	LWRITEK2	0000'	MAIN	0877'	MOVE1
0A1D'	MOVE3	077C'	MOVEA	0805'	MOVEALL
079B'	MOVEB	07D2'	MOVEO	0486'	MOVEPATN
0320'	MOVESORT	0C36'	MSG\$OPENI	0C82'	MSGCONI
0C76'	MSGDR	0C7C'	MSGPRT	0E09'	MSGSORT
0CA3'	MULT	0CA8'	MULT1	0CAD'	MULT2
015D'	NAMEF	00A3'	NAMEIN	0E5C'	NAMEO
00DB'	NAMEOUT	0B4F'	NEXTKEY	07B2'	NEXTREC
06C5'	NOADD	0D02'	NOTFOUND	000F	OPENF
0CC1'	OPENFL	0C6E'	PCLEARO	0192'	PLO15
068E'	POPST	0009	PRTSTR	0AE6'	PST08R
0D09'	PSYNERR	067B'	PUSHST	0D21'	PUTDSKI
0D98'	PUTDSKO	0D40'	PUTDSKW	0D71'	PUTDSKW C
0BC3'	PWRITEO	0BDD'	PWRITEO1	0949'	READB
000A	READCONS	0BB2'	READIR	0BAC'	READIS
0A27'	READKEY	04A5'	READLEC	0B95'	READNEXT
0021	READR	095B'	READREC	0014	READS
0E6C'	REC	0E71'	RECA	0E73'	RECB
0E6F'	RECL	0E77'	RECNO	06CE'	RECV\$1
0017	RENAMEF	000D	RESETD SK	0039'	RET\$03\$06
11C8'	SAVE	04E0'	SAVEBF04	08CF'	SEDZ
01CC'	SEQ	001A	SETDMA	0024	SETRNDR
003A'	ST01	022C'	ST02	024E'	ST02C
02D3'	ST03	0029'	ST03\$06	0477'	ST03INIT
03B8'	ST03R	02ED'	ST03S	0501'	ST04
051A'	ST042	0551'	ST043	059E'	ST044
060D'	ST045	0647'	ST046	0694'	ST05
0719'	ST06	0970'	ST07	0A45'	ST08
0A9F'	ST08A	0AAB'	ST08C	0AA5'	ST08D
0B25'	ST08INIT	0AFO'	ST08R	0AB8'	ST08S
0B6D'	ST08UPK	0592'	ST3Y	0604'	ST4S1Y
05D2'	ST4Y	0634'	STSY	05A6'	STLR
05E4'	STLRN	05B1'	STLRY	00EF'	STOK
0010'	STOP	0142'	STOREKL	01C8'	STORERL
055D'	STRL	058D'	STRLN	0567'	STRLY
0E69'	STYPE	0C80'	SUBDE	0E6E'	SUBREC
0145'	SUMLEN	0DOC'	SYNERR	0148'	VALLE9
08B3'	WRITEA	08A6'	WRITEAO	081F'	WRITEB
083F'	WRITEB1	0859'	WRITEB2	0CEF'	WRITEFL
070D'	WRITEK1	0920'	WRITEK2	0BF8'	WRITEO
0015	WRITES	092A'	WRITESEQ		

No Fatal error(s)



ภาคผนวก ง.
แสดงตัวอย่างการใช้คำสั่ง 'SORT'

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



ภาคผนวก ง.
แสดงตัวอย่างการใช้คำสั่ง 'SORT'

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



ตัวอย่างโปรแกรมกาใช้คำสั่ง 'SORT'

```
1000 'XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1010 '                DEMO PROGRAM
1020 'XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1030 HOME
1040 VTAB 10 : HTAB 20
1050 PRINT "NOW IN DEMONSTRATION OF SORT COMMANDS"
1060 VTAB 12 : HTAB 26
1070 PRINT "THEN PRESS ENTER FOR SORTING ! ";
1080 INPUT "", A$
1090 SORT S,A:DATA.IN,A:DATA.OUT,A(#2,25,#1,7)
1100 END
```

การใช้คำสั่ง 'SORT' อยู่ที่บรรทัด (Line Number) 1090 จะทำการเรียงลำดับข้อมูลของแฟ้มข้อมูลนำเข้าแบบอันดับชื่อ 'DATA.IN' อยู่ที่ตู้งานแม่เหล็กแบบอ่อน A ได้แฟ้มข้อมูลนำออกแบบอันดับเช่นกันชื่อ 'DATA.OUT' อยู่ที่ตู้งานแม่เหล็กแบบอ่อนเดียวกันที่เรียงลำดับแบบน้อยไปมากด้วยคีย์ที่ ๒ ยาว ๒๕ ไบต์ เป็นคีย์หลัก และคีย์ที่ ๑ ยาว ๗ ไบต์ เป็นคีย์รอง เนื้อที่งานแม่เหล็กแบบอ่อนที่ใช้ทำงานอยู่ที่ตู้งานแม่เหล็กแบบอ่อน B

จุฬาลงกรณ์มหาวิทยาลัย

ตัวอย่างเพิ่มเติมข้อมูลนำเข้าชื่อ 'DATA.IN'

1100001, YEAST RAISED MIX	,G.H.	,50 LBS/BG	,BG	,LBS
1100002, CAKE MIX	,G.H.	,50 LBS/BG	,BG	,LBS
1100003, CHOCOLATE MIX	,G.H.	,50 LBS/BG	,BG	,LBS
1100004, BUTERMILK MIX	,G.H.	,50 LBS/BG	,BG	,LBS
1100005, FRENCH CRULLER MIX	,G.H.	,40 LBS/BG	,BG	,LBS
1200001, APPLE DONUT FILLING	,US.	,7.5 LBS/6 CAN/CS	,CAN	,LBS
1200002, BLUEBERRY D. FILLING	,US.	,7.5 LBS/6 CAN /CS	,CAN	,LBS
1200003, CHERRY D. FILLING	,US.	,7.5 LBS /6 CAN /CS	,CAN	,LBS
1200004, APRICOT D. FILLING	,US.	,7.5 LBS /6 CAN /CS	,CAN	,LBS
1200005, APPL RASBERRY	,C.P.C	,20 KGS/PL	,KGS	,KGS
1200006, BLACK RASBERRY	,C.P.C	,20 KGS/PL	,KGS	,KGS
1200008, PINE APPLE D. FILLING	,C.P.C	,20 KGS/PL	,KGS	,KGS
1200010, BAVARAIN D. FILLING	,QEEN	,4 KGS/6CAN/CS	,KGS	,KGS
1200011, BAVARAIN D. FILLING	,C.P.C	,20 KGS/PL	,KGS	,KGS
1200012, CREAM MIXTURE	,M.K	,15 KGS/CS	,KGS	,KGS
1200013, MAGARINE	,M.K	,15 KGS/TIN	,KGS	,KGS
1200014, SILVERCLOUD	,PORN PROM	,15 KGS/CS	,KGS	,KGS
1200015, ICING CREAMING SUGAR	,M.K	,25 KGS/CS	,KGS	,KGS
1200016, HEAVENLY WHITE	,US.	,35 LBS/PL	,LBS	,LBS
1200017, LEMON D FILLING	,US.	,7.5 LBS /6 CAN	,LBS	,LBS
1300001, SHORTENING	,US.	,50 LBS/CS	,LBS	,LBS
1300002, FRESH YEAST	,BBI.	,KGS	,KGS	,KGS
1300003, INSTANT YEAST	,US.	,	,LBS	,LBS
1300004, STRAWBERRY BLOSSOM	,US.	,1 Q.T/BOT	,Q.T	,Q.T
1300006, CINNAMON POWDER	,G.H	,200 GRM / CAN	,LBS	,LBS
1300007, VANILA FLAVOUR	,US.	,1 GALL/BOT	,LBS	,LBS
1300008, DUSTING FLOUR	,G.H	,22.5 KGS /BG	,KGS	,KGS
1300009, CHOCOLATE FUDE BASE	,US.	,50 LBS/PL	,LBS	,LBS
1400001, RAINBOW SPRINKLE	,BAKERY MEX,		,KGS	,KGS
1400002, BUTTERSCOTH CRUNCH	,US.	,30 LBS/CS	,LBS	,LBS
1400003, PENUT CRUNCH	,SOPA	,10 KGS/BG	,KGS	,KGS
1400004, COCONUT	,	,25 KGS/BG	,KGS	,KGS
1500001, CINNAMON SUGAR	,GH.	,50 LBS/BG	,LBS	,LBS
1500002, DONUT SUGAR	,GH.	,50 LBS/CS	,LBS	,LBS
1500003, BAKERS SPECIAL	,GH.	,55 LBS/CS	,LBS	,LBS
1500004, HONEY DIP ICING SUGAR	,GH.	,50 LBS/BG	,LBS	,LBS
2110001, BASIC MIX	,GH.	,50 LBS/BG	,LBS	,LBS
2110002, CORN MIX	,GH.	,50 LBS/BG	,LBS	,LBS
2110003, BARN MIX	,GH.	,50 LBS/BG	,LBS	,LBS
2120001, APPLE TURNOVER	,US.	,7 LBS/6CAN/CS	,LBS	,LBS
2120002, BLUEBERRY PIL FILLING	,US.	,7.25LBS/6 CAN/CS	,LBS	,LBS
2120003, CHERRY PIL FILLING	,US.	,7.25 LBS/6 CAN/CS	,LBS	,LBS
2120004, RAISIN	,SS.	,10 KGS/BG	,LBS	,LBS
2120005, CASHEWNUT	,	,10 KGS/BG	,KGS	,KGS
2120006, PAN GREASE	,US	,16 LBS/PL	,PL	,PL
2120007, ORANGE FRUITEX	,US	,6 LBS/6 JAR / CS	,JAR	,LBS
2120008, CHERRY FRUITEX	,US.	,6 LBS/6 JSR / CS	,JAR	,LBS
2120009, BANANA FRUITEX	,US.	,6 LBS/6 JAR / CS	,JAR	,LBS
2120010, BUTTER	,KIM CHUA	,60 PCS/CS	,	,PCS

ตัวอย่างเพิ่มเติมข้อมูลนำเข้าชื่อ 'DATA.IN' (ต่อ)

2210001,COOKIE MIX	,GH.	,50	LBS/BG	,LBS	,LBS
2210002,BROWNIE MIX	,GH.	,50	LBS/BG	,LBS	,LBS
2210003,MACARON MIX	,GH.	,50	LBS/BG	,LBS	,LBS
2220001,HERSHEY P.B. CHIPS	,US.	,25	LBS/CS	,LBS	,LBS
2220002,NESILE CHOC. CHIPS	,US.	,40	LBS/CS	,LBS	,LBS
2220003,WALNUTS LOCAL	,CHAI CHANA,	20	KGS/CS	,KGS	,KGS
3100001,DD. ROASTED COFFEE BEAN	,US.	,7	LBS/4 BG / CS	,LBS	,LBS
1200009,LEMON D. FILLING	,C.P.C	,20	KGS/PL	,KGS	,KGS
3100002,COFFEE BEAN	,S.W	,1	KG/10 BG/CS	,KGS	,KGS
3100003,COFFEE SUGAR	,GH.	,25	KG/BOX	,KGS	,KGS
3100004,SUGAR PACKAGE	,SRITHAI	,100	PCK/3BOX/CS	,PCS	,PCS
3100005,SWEET'LOW	,US.	,100	PCK/3 BOX/CS	,PCS	,PCS
3100006,EVAPORATED MILK	,M.K.	,48	CAN/CS	,CAN	,CAN
3100007,DD. BLEND GREEN COFFEE	,	,10	LBS/4 BG/CS	,LBS	,LBS
3200001,FRESH MILK	,FOREMOST	,	,	,Q.T.	,Q.T.
3200002,FRESH MILK	,FOREMOST	,	,	,GAL	,GAL
3200003,HOT COCOA INSTANT	,US.	,2	LBS/12 PKG/CS	,LBS	,LBS
3200004,SANKA DD	,US.	,100	PAK/10 BOX/ CS	,PCS	,PCS
3200005,TEA BAG (LIPION)	,	,100	PCK/BOX	,PCS	,PCS
3200006,VITACO CHOCOLATE	,VITACO	,1	KG/6BGS/CS	,KGS	,KGS
3200007,FANTA ORANGE SYRUP	,BES	,4	GAL/CS	,GAL	,GAL
3200008,FANTA GRAPE SYRUP	,BES	,4	GAL/CS	,GAL	,GAL
3200009,SUNQUICK	,DUMEX	,1000	CC/6/BOT/CS	,BOT	,BOT
3200010,MOUNTAIN BEST	,LEO.	,720	CC/12BOT/CS	,BOT	,BOT
3200011,COATING CHOCOLATE	,VITACO	,1	KG/6 BG/CS	,KGS	,KGS
3200012,ICED	,	,	,	,	,
3300001,COKE	,BES	,1	GAL/BOT	,GAL	,GAL
3300002,ROOT BEER	,BES	,1	GAL/BOT	,GAL	,GAL
3300003,SPRITE	,BES	,1	GAL/BOT	,GAL	,GAL
3300004,STRAWBERRY	,BES	,1	GAL/BOT	,GAL	,GAL
3300005,GREEN	,BES	,1	GAL/BOT	,GAL	,GAL
3300006,PEPSI	,SERM SUK	,1	GAL/BOT	,GAL	,GAL
3300007,TEAM	,SERM SUK	,1	GAL/BOT	,GAL	,GAL
3300008,STRAWBERRY	,SERM SUK	,1	GAL/BOT	,GAL	,GAL
3300009,GREEN	,SERM SUK	,1	GAL/BOT	,GAL	,GAL
3300010,MOUNTAIN DEW	,SERM SUK	,1	GAL/BOT	,GAL	,GAL
4100001,HOT CUPS 6 OZ	,US.	,50	PCS/20BDL/CS	,PCS	,PCS
4100002,LID 6 OZ	,US.	,100	PCS/20BDL/CS	,PCS	,PCS
4100003,HOT CUP 10 OZ	,SHERRY	,50	PCS/20 BDL/CS	,PCS	,PCS
4100004,LID 10 OZ	,SHERRY	,100	PCS/20 BDL/CS	,PCS	,PCS
4100005,HOT CUP 10 OZ	,LILLY	,50	PCS /20 BDL/CS	,PCS	,PCS
4100006,LID 10 OZ	,LILLY	,100	PCS/20 BDL/CS	,PCS	,PCS
4100007,BIG ONE CUP 14-16 OZ	,US.	,25	PCS/40 BDL/CS	,PCS	,PCS
4100008,BIG ONE LID 14-16 OZ	,US.	,100	PCS/10 BDL/CS	,PCS	,PCS
4100009,COLD CUP 24 OZ	,US.	,50	PCS/20 BDL/CS	,PCS	,PCS
4100010,LID 24 OZ	,US.	,100	PCS/10 BDL/CS	,PCS	,PCS
4100011,BIG ONE CUP 14 OZ	,VIS & SON	,25	PCS/40 BDL/CS	,PCS	,PCS
4100012,BIG ONE LID 14 OZ	,VIS & SON	,100	PCS/30 BDL/CS	,PCS	,PCS
4100013,HONGKONG COLD CUP 16 OZ	,HK.	,50	PCS/20 BDL/CS	,PCS	,PCS

ตัวอย่างเพิ่มข้อมูลนำเข้าชื่อ 'DATA.IN' (ต่อ)

4100014,LID FOR HK 16 OZ	,VIS & SON	,100 PCS/30 BDL/CS	,PCS	,PCS
4100015,LID 16 OZ	,VIS & SON	,100 PCS/30 BDL/CS	,PCS	,PCS
4100016,PLASTIC COLD CUP 16 OZ	,CUSTOMPAC	,500 PCS/CS	,PCS	,PCS
4100017,LID PLASTIC CUP 16 OZ	,VIS & SON	,100 PCS/30 BDL/CS	,PCS	,PCS
4100018,PLASTIC CUP 6 OZ	,CUSTOMPAC	,2000 PCS/CS	,PCS	,PCS
4100019,DONUT BOX REGULAR	,US.	,350 PCS/CS	,PCS	,PCS
4100020,DONUT BOX REGULAR	,THONG SIAM	,500 PCS/BDL	,PCS	,PCS
4100021,FANCY BOX	,THONG SIAM	,200 PCS/BDL	,PCS	,PCS
4100022,DONUT BOX 'BASKET'	,THONG SIAM	,200 PCS/BDL	,PCS	,PCS
4100023,DONUT BOX REGULAR	,NIYOMCHANG	,200 PCS/BDL	,PCS	,PCS
4100024,KRAFT BAG #4	,US.	,400 PCS/BDL	,PCS	,PCS
4100025,MUNCHKIN # 20	,THONG SIAM	,200 PCS/BDL	,PCS	,PCS
4100026,MUNCHKIN # 45	,THONG SIAM	,400 PCS/BDL	,PCS	,PCS
4100027,MUNCHKIN # 45	,US.	,350 PCS/CS	,PCS	,PCS
4100028,MUNCHKIN # 60	,US.	,300 PCS/CS	,PCS	,PCS
4100029,DONUT WAX BAGS 'SS'	,THONG SIAM	,1000 PCS/BDL	,PCS	,PCS
4100030,DONUT WAX BAGS 'SMALL'	,THONG SIAM	,1000 PCS/BDL	,PCS	,PCS
4100031,DONUT WAX BAGS 'LARGE'	,THONG SIAM	,1000 PCS/BDL	,PCS	,PCS
4100032,PAPER SHOPPING BAG 'L'	,THAI PAPER	,100 PCS/BDL	,PCS	,PCS
4100033,PLASTIC BAG 'S'	,PIONEER	,200 PCS/25BDL/CS	,BDL	,BDL
4100034,PLASTIC BAG 'L'	,PIONEER	,200 PCS/25BDL/CS	,BDL	,BDL
4100035,PLASTIC BAG 'L'	,SUNFLOWER	,200 PCS/25BDL/CS	,BDL	,BDL
4100036,PLASTIC BAG 'S'	,SUNFLOWER	,200 PCS/25 BDL/CS	,BDL	,BDL
4100037,DD. NAPKIN	,US.	,250 PCS/60 BDL/CS	,BDL	,BDL
4100038,LOCAL NAPKIN	,SPL.	,36 BDL/CS	,BDL	,BDL
4100039,DD. SAV-A-RAP	,US.	,10 BOX/CS	,BOX	,BOX
4100040,SAV-A-RAP (PRINTED)	,THONG SIAM	,1000 PCS/BDL	,BDL	,BDL
4100041,DD. COFFEE STIRRER	,US.	,10 BOX/CS	,BOX	,BOX
4100042,SAV-A-RAP (PLAIN)	,THONG SIAM	,1000 PCS/BDL	,BDL	,BDL
4100043,STRAAW PRINTED	,SUNFLOWER	,1000 PCS/10 BOX/CS	,BOX	,BOX
4100044,BENDABLE STRAW	,SUNFLOWER	,250 PCS/40BDL/CS	,BDL	,BDL
4100045,WHITENEW LINER	,	,20 KGS/BDL	,KGS	,KGS
4100046,PAPER PLATE MATE	,US.	,5 BOX/CS	,BOX	,BOX
4100047,PLASTIC TRAY LINER	,US.	,1000 PCS/CS	,BOX	,BOX
4100048,PAPER ECLAIR CUP	,US.	,10 BOX/CS	,BOX	,BOX
4100049,PAPER FANCY CUP	,LOCAL	,1000 PCS/BDL	,BDL	,BDL
4100050,MUFFIN PLASTIC MOULDS	,US.	,1000 PCS/CS	,PCS	,PCS
4100051,COFFEE PAPER FILTER	,SAKOL PAN	,250 PCS/4 BDL/CS	,BDL	,BDL
4100052,AUTO TRAY 4 CUP	,US.	,250 PCS/CS	,PCS	,PCS
4100053,6 CARRIER TRAY	,US.	,250 PCS/CS	,PCS	,PCS
4100054,UNITAPE	,	,8 ROLLS/12 CAN/CS	,ROL	,ROL
4100055,SILICON BAKING LINER	,US.	,1000 PCS/CS	,PCS	,PCS
4100056,COFFEE BAG	,US.	,1000 PCS/CS	,PCS	,PCS
4100057,SOUP FOAM BOWL 12. OZ	,US.	,500 PCS/CS	,PCS	,PCS
4100058,LID FOR SOUP FOAM BOWL	,US.	,1000 PCS/CS	,PCS	,PCS
1200007,STRAWBERRY D. FILLING	,C.P.C	,20 KGS/PL	,KGS	,KGS
1300005,STRAWBERRY FLAVOUR	,	,1 OZ/BOT	,OZ	,OZ
5100001,COLD GLASS 16 OZ	,US.	,	,DOZ	,DOZ
5100002,COLD GLASS 10 OZ	,	,	,DOZ	,DOZ

ตัวอย่างแฟ้มข้อมูลนำเข้าชื่อ 'DATA.IN' (ต่อ)

5100003, JUICE GLASS 6 OZ	,	,	,	DOZ	, DOZ
5100004, PLAIN COFFEE MUG	,	,	,	,	,
5100005, EMPLOYEE CUP	,	,	,	DOZ	, DOZ
5100006, ARSH TRAY GLASS	,	,	,	,	,
5100007, COFFEE MUG	,	,	,	,	,
6100001, CHINESE NEW YEAR BOX L	,	, 200 PCS/BDL	,	BDL	, BDL
6100002, CHINESE NEW YEAR BOX S	,	, 200 PCS/BDL	,	PCS	, PCS
6100003, CHINESE NEW YEAR BOX L	,	THONG SIAM, 500 PCS/BDL	,	PCS	, PCS
6100004, CHINESE NEW YEAR BOX S	,	THONG SIAM, AAAAAAAAAAAAAAAAAAAAAA	,	AAAAA	, AAAAA



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

ตัวอย่างเพิ่มเติมข้อมูลนำออกชื่อ 'DATA.OUT'

4100053,6 CARRIER TRAY	,US.	,250 PCS/CS	,PCS	,PCS
1200005,APPL RASBERRY	,C.P.C	,20 KGS/PL	,KGS	,KGS
1200001,APPLE DONUT FILLING	,US.	,7.5 LBS/6 CAN/CS	,CAN	,LBS
2120001,APPLE TURNOVER	,US.	,7 LBS/6CAN/CS	,LBS	,LBS
1200004,APRICOT D. FILLING	,US.	,7.5 LBS /6 CAN /CS	,CAN	,LBS
5100006,ARSH TRAY GLASS	,	,	,	,
4100052,AUTO TRAY 4 CUP	,US.	,250 PCS/CS	,PCS	,PCS
1500003,BAKERS SPECIAL	,GH.	,55 LBS/CS	,LBS	,LBS
2110003,BARN MIX	,GH.	,50 LBS/BG	,LBS	,LBS
2110001,BASIC MIX	,GH.	,50 LBS/BG	,LBS	,LBS
1200011,BAVARAIN D. FILLING	,C.P.C	,20 KGS/PL	,KGS	,KGS
1200010,BAVARAIN D. FILLING	,QEEN	,4 KGS/6CAN/CS	,KGS	,KGS
4100044,BENDABLE STRAW	,SUNFLOWER	,250 PCS/40BDL/CS	,BDL	,BDL
4100011,BIG ONE CUP 14 OZ	,VIS & SON	,25 PCS/40 BDL/CS	,PCS	,PCS
4100007,BIG ONE CUP 14-16 OZ	,US.	,25 PCS/40 BDL/CS	,PCS	,PCS
4100012,BIG ONE LID 14 OZ	,VIS & SON	,100 PCS/30 BDL/CS	,PCS	,PCS
4100008,BIG ONE LID 14-16 OZ	,US.	,100 PCS/10 BDL/CS	,PCS	,PCS
1200006,BLACK RASBERRY	,C.P.C	,20 KGS/PL	,KGS	,KGS
1200002,BLUEBERRY D. FILLING	,US.	,7.5 LBS/6 CAN /CS	,CAN	,LBS
2120002,BLUEBERRY PIL FILLING	,US.	,7.25LBS/6 CAN/CS	,LBS	,LBS
2210002,BROWNIE MIX	,GH.	,50 LBS/BG	,LBS	,LBS
1100004,BUTERMILK MIX	,G.H.	,50 LBS/BG	,BG	,LBS
2120010,BUTTER	,KIM CHUA	,60 PCS/CS	,	,PCS
1400002,BUTTERSCOTH CRUNCH	,US.	,30 LBS/CS	,LBS	,LBS
1100002,CAKE MIX	,G.H.	,50 LBS/BG	,BG	,LBS
2120005,CASHEWNUT	,	,10 KGS/BG	,KGS	,KGS
1200003,CHERRY D. FILLING	,US.	,7.5 LBS /6 CAN /CS	,CAN	,LBS
2120008,CHERRY FRUITEX	,US.	,6 LBS/6 JSR / CS	,JAR	,LBS
2120003,CHERRY PIL FILLING	,US.	,7.25 LBS/6 CAN/CS	,LBS	,LBS
6100001,CHINESE NEW YEAR BOX L	,	,200 PCS/BDL	,BDL	,BDL
6100003,CHINESE NEW YEAR BOX L	,THONG SIAM	,500 PCS/BDL	,PCS	,PCS
6100002,CHINESE NEW YEAR BOX S	,	,200 PCS/BDL	,PCS	,PCS
6100004,CHINESE NEW YEAR BOX S	,THONG SIAM	,AAAAAAAAAAAAAAAAAAAAA	,AAAAA	,AAAAA
1100003,CHOCOLATE MIX	,G.H.	,50 LBS/BG	,BG	,LBS
1300009,CHOCOLATE FUDE BASE	,US.	,50 LBS/PL	,LBS	,LBS
1300006,CINNAMON POWDER	,G.H.	,200 GRM / CAN	,LBS	,LBS
1500001,CINNAMON SUGAR	,GH.	,50 LBS/BG	,LBS	,LBS
3200011,COATING CHOCOLATE	,VITACO	,1 KG/6 BG/CS	,KGS	,KGS
1400004,COCONUT	,	,25 KGS/BG	,KGS	,KGS
4100056,COFFEE BAG	,US.	,1000 PCS/CS	,PCS	,PCS
3100002,COFFEE BEAN	,S.W	,1 KG/10 BG/CS	,KGS	,KGS
5100007,COFFEE MUG	,	,	,	,
4100051,COFFEE PAPER FILTER	,SAKOL PAN	,250 PCS/4 BDL/CS	,BDL	,BDL
3100003,COFFEE SUGAR	,GH.	,25 KG/BOX	,KGS	,KGS
3300001,COKE	,BES	,1 GAL/BOT	,GAL	,GAL
4100009,COLD CUP 24 OZ	,US.	,50 PCS/20 BDL/CS	,PCS	,PCS
5100002,COLD GLASS 10 OZ	,	,	,DOZ	,DOZ
5100001,COLD GLASS 16 OZ	,US.	,	,DOZ	,DOZ
2210001,COOKIE MIX	,GH.	,50 LBS/BG	,LBS	,LBS

ตัวอย่างแฟ้มข้อมูลนำออกชื่อ 'DATA.OUT' (ต่อ)

2110002,CORN MIX	,GH.	,50 LBS/BG	,LBS	,LBS
1200012,CREAM MIXTURE	,M.K	,15 KGS/CS	,KGS	,KGS
3100007,DD. BLEND GREEN COFFEE	,	,10 LBS/4 BG/CS	,LBS	,LBS
4100041,DD. COFFEE STIRRER	,US.	,10 BOX/CS	,BOX	,BOX
4100037,DD. NAPKIN	,US.	,250 PCS/60 BDL/CS	,BDL	,BDL
3100001,DD. ROASTED COFFEE BEAN	,US.	,7 LBS/4 BG / CS	,LBS	,LBS
4100039,DD. SAV-A-RAP	,US.	,10 BOX/CS	,BOX	,BOX
4100022,DONUT BOX 'BASKET'	,THONG SIAM,	200 PCS/BDL	,PCS	,PCS
4100019,DONUT BOX REGULAR	,US.	,350 PCS/CS	,PCS	,PCS
4100020,DONUT BOX REGULAR	,THONG SIAM,	500 PCS/BDL	,PCS	,PCS
4100023,DONUT BOX REGULAR	,NIYOMCHANG,	200 PCS/BDL	,PCS	,PCS
1500002,DONUT SUGAR	,GH.	,50 LBS/CS	,LBS	,LBS
4100031,DONUT WAX BAGS 'LARGE'	,THONG SIAM,	1000 PCS/BDL	,PCS	,PCS
4100030,DONUT WAX BAGS 'SMALL'	,THONG SIAM,	1000 PCS/BDL	,PCS	,PCS
4100029,DONUT WAX BAGS 'SS'	,THONG SIAM,	1000 PCS/BDL	,PCS	,PCS
1300008,DUSTING FLOUR	,G.H	,22.5 KGS /BG	,KGS	,KGS
5100005,EMPLOYEE CUP	,	,	,DOZ	,DOZ
3100006,EVAPORATED MILK	,M.K.	,48 CAN/CS	,CAN	,CAN
4100021,FANCY BOX	,THONG SIAM,	200 PCS/BDL	,PCS	,PCS
3200008,FANTA GRAPE SYRUP	,BES	,4 GAL/CS	,GAL	,GAL
3200007,FANTA ORANGE SYRUP	,BES	,4 GAL/CS	,GAL	,GAL
1100005,FRENCH CRULLER MIX	,G.H.	,40 LBS/BG	,BG	,LBS
3200001,FRESH MILK	,FOREMOST	,	,Q.T.	,Q.T.
3200002,FRESH MILK	,FOREMOST	,	,GAL	,GAL
1300002,FRESH YEAST	,BBI.	,KGS	,KGS	,KGS
3300005,GREEN	,BES	,1 GAL/BOT	,GAL	,GAL
3300009,GREEN	,SERM SUK	,1 GAL/BOT	,GAL	,GAL
1200016,HEAVENLY WHITE	,US.	,35 LBS/PL	,LBS	,LBS
2220001,HERSHEY P.B. CHIPS	,US.	,25 LBS/CS	,LBS	,LBS
1500004,HONEY DIP ICING SUGAR	,GH.	,50 LBS/BG	,LBS	,LBS
4100013,HONGKONG COLD CUP 16 OZ	,HK.	,50 PCS/20 BDL/CS	,PCS	,PCS
3200003,HOT COCOA INSTANT	,US.	,2 LBS/12 PKG/CS	,LBS	,LBS
4100003,HOT CUP 10 OZ	,SHERRY	,50 PCS/20 BDL/CS	,PCS	,PCS
4100005,HOT CUP 10 OZ	,LILLY	,50 PCS /20 BDL/CS	,PCS	,PCS
4100001,HOT CUPS 6 OZ	,US.	,50 PCS/20BDL/CS	,PCS	,PCS
3200012,ICED	,	,	,	,
1200015,ICING CREAMING SUGAR	,M.K	,25 KGS/CS	,KGS	,KGS
1300003,INSTANT YEAST	,US.	,	,LBS	,LBS
5100003,JUICE GLASS 6 OZ	,	,	,DOZ	,DOZ
4100024,KRAFT BAG #4	,US.	,400 PCS/BDL	,PCS	,PCS
1200017,LEMON D FILLING	,US.	,7.5 LBS /6 CAN	,LBS	,LBS
1200009,LEMON D. FILLING	,C.P.C	,20 KGS/PL	,KGS	,KGS
4100004,LID 10 OZ	,SHERRY	,100 PCS/20 BDL/CS	,PCS	,PCS
4100006,LID 10 OZ	,LILLY	,100 PCS/20 BDL/CS	,PCS	,PCS
4100015,LID 16 OZ	,VIS & SON	,100 PCS/30 BDL/CS	,PCS	,PCS
4100010,LID 24 OZ	,US.	,100 PCS/10 BDL/CS	,PCS	,PCS
4100002,LID 6 OZ	,US.	,100 PCS/20BDL/CS	,PCS	,PCS
4100014,LID FOR HK 16 OZ	,VIS & SON	,100 PCS/30 BDL/CS	,PCS	,PCS
4100058,LID FOR SOUP FOAM BOWL	,US.	,1000 PCS/CS	,PCS	,PCS

ตัวอย่างเพิ่มเติมข้อมูลนำออกชื่อ 'DATA.OUT' (ต่อ)

4100017,LID PLASTIC CUP 16 OZ	,VIS & SON	,100 PCS/30 BDL/CS	,PCS	,PCS
4100038,LOCAL NAPKIN	,SPL.	,36 BDL/CS	,BDL	,BDL
2210003,MACARON MIX	,GH.	,50 LBS/BG	,LBS	,LBS
1200013,MAGARINE	,M.K	,15 KGS/TIN	,KGS	,KGS
3200010,MOUNTAIN BEST	,LEO.	,720 CC/12BOT/CS	,BOT	,BOT
3300010,MOUNTAIN DEW	,SERM SUK	,1 GAL/BOT	,GAL	,GAL
4100050,MUFFIN PLASTIC MOULDS	,US.	,1000 PCS/CS	,PCS	,PCS
4100025,MUNCHKIN # 20	,THONG SIAM	,200 PCS/BDL	,PCS	,PCS
4100026,MUNCHKIN # 45	,THONG SIAM	,400 PCS/BDL	,PCS	,PCS
4100027,MUNCHKIN # 45	,US.	,350 PCS/CS	,PCS	,PCS
4100028,MUNCHKIN # 60	,US.	,300 PCS/CS	,PCS	,PCS
2220002,NESTLE CHOC. CHIPS	,US.	,40 LBS/CS	,LBS	,LBS
2120007,ORANGE FRUITEX	,US	,6 LBS/6 JAR / CS	,JAR	,LBS
2120006,PAN GREASE	,US	,16 LBS/PL	,PL	,PL
4100048,PAPER ECLAIR CUP	,US.	,10 BOX/CS	,BOX	,BOX
4100049,PAPER FANCY CUP	,LOCAL	,1000 PCS/BDL	,BDL	,BDL
4100046,PAPER PLATE MATE	,US.	,5 BOX/CS	,BOX	,BOX
4100032,PAPER SHOPPING BAG 'L'	,THAI PAPER	,100 PCS/BDL	,PCS	,PCS
1400003,PENUT CRUNCH	,SOPA	,10 KGS/BG	,KGS	,KGS
3300006,PEPSI	,SERM SUK	,1 GAL/BOT	,GAL	,GAL
1200008,PINE APPLE D. FILLING	,C.P.C	,20 KGS/PL	,KGS	,KGS
5100004,PLAIN COFFEE MUG	,	,	,	,
4100034,PLASTIC BAG 'L'	,PIONEER	,200 PCS/25BDL/CS	,BDL	,BDL
4100035,PLASTIC BAG 'L'	,SUNFLOWER	,200 PCS/25BDL/CS	,BDL	,BDL
4100033,PLASTIC BAG 'S'	,PIONEER	,200 PCS/25BDL/CS	,BDL	,BDL
4100036,PLASTIC BAG 'S'	,SUNFLOWER	,200 PCS/25 BDL/CS	,BDL	,BDL
4100016,PLASTIC COLD CUP 16 OZ	,CUSTOMPAC	,500 PCS/CS	,PCS	,PCS
4100018,PLASTIC CUP 6 OZ	,CUSTOMPAC	,2000 PCS/CS	,PCS	,PCS
4100047,PLASTIC TRAY LINER	,US.	,1000 PCS/CS	,BOX	,BOX
1400001,RAINBOW SPRINKLE	,BAKERY MEX,		,KGS	,KGS
2120004,RAISIN	,SS.	,10 KGS/BG	,LBS	,LBS
3300002,ROOT BEER	,BES	,1 GAL/BOT	,GAL	,GAL
3200004,SANKA DD	,US.	,100 PAK/10 BOX/ CS	,PCS	,PCS
4100042,SAV-A-RAP (PLAIN)	,THONG SIAM	,1000 PCS/BDL	,BDL	,BDL
4100040,SAV-A-RAP (PRINTED)	,THONG SIAM	,1000 PCS/BDL	,BDL	,BDL
1300001,SHORTENING	,US.	,50 LBS/CS	,LBS	,LBS
4100055,SILICON BAKING LINER	,US.	,1000 PCS/CS	,PCS	,PCS
1200014,SILVERCLOUD	,PORN PROM	,15 KGS/CS	,KGS	,KGS
4100057,SOUP FOAM BOWL 12. OZ	,US.	,500 PCS/CS	,PCS	,PCS
3300003,SPRITE	,BES	,1 GAL/BOT	,GAL	,GAL
4100043,STRAAW PRINTED	,SUNFLOWER	,1000 PCS/10 BOX/CS	,BOX	,BOX
3300004,STRAWBERRY	,BES	,1 GAL/BOT	,GAL	,GAL
3300008,STRAWBERRY	,SERM SUK	,1 GAL/BOT	,GAL	,GAL
1300004,STRAWBERRY BLOSSOM	,US.	,1 Q.T/BOT	,Q.T	,Q.T
1200007,STRAWBERRY D. FILLING	,C.P.C	,20 KGS/PL	,KGS	,KGS
1300005,STRAWBERRY FLAVOUR	,	,1 OZ/BOT	,OZ	,OZ
3100004,SUGAR PACKAGE	,SRITHAI	,100 PCK/3BOX/CS	,PCS	,PCS
3200009,SUNQUICK	,DUMEX	,1000 CC/6/BOT/CS	,BOT	,BOT
3100005,SWEET'LOW	,US.	,100 PCK/3 BOX/CS	,PCS	,PCS

ตัวอย่างเพิ่มข้อมูลนำออกชื่อ 'DATA.OUT' (ต่อ)

3200005,TEA BAG (LIPION)	,	,100	PCK/BOX	,PCS	,PCS
3300007,TEAM	,SERM SUK	,1	GAL/BOT	,GAL	,GAL
4100054,UNITAPE	,	,8	ROLLS/12 CAN/CS	,ROL	,ROL
1300007,VANILA FLAVOUR	,US.	,1	GALL/BOT	,LBS	,LBS
3200006,VITACO CHOCOLATE	,VITACO	,1	KG/6BGS/CS	,KGS	,KGS
2220003,WALNUTS LOCAL	,CHAI CHANA,	20	KGS/CS	,KGS	,KGS
4100045,WHITENEW LINER	,	,20	KGS/BDL	,KGS	,KGS
1100001,YEAST RAISED MIX	,G.H.	,50	LBS/BG	,BG	,LBS



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

ประวัติผู้เขียน

นางสาว จุฑารัตน์ เรืองหทัยธรรม เกิดวันที่ ๔ ธันวาคม ๒๕๐๓ ที่จังหวัดราชบุรี
สำเร็จการศึกษา วิทยาศาสตร์บัณฑิต (คณิตศาสตร์) จากคณะวิทยาศาสตร์
มหาวิทยาลัยศรีนครินทรวิโรฒ วิทยาเขตปทุมวัน ในปี พ.ศ. ๒๕๒๔



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย