

## เอกสารอ้างอิง

- ชงชัย สันติวงษ์. องค์การและการบริหาร. กรุงเทพมหานคร:สำนักพิมพ์ไทยวัฒนาพานิช, ๒๕๑๖.
- สุทธิชัย โง้วศิริ. หลักสถิติ. กรุงเทพมหานคร:โรงพิมพ์การศาสนา, ๒๕๑๕.
- สมพงศ์ เกษมสิน. การบริหารงานบุคคลแผนใหม่. กรุงเทพมหานคร:สำนักพิมพ์ไทยวัฒนาพานิช, ๒๕๑๖.
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ภาคผนวก

MAIN PROGRAM

STORAGE USED CODE(1) 000642; DATA(0) 001344; BLANK COMMON(2) 000000

EXTERNAL REFERENCES (BLOCK, NAME)

0003 SOLVE  
 0004 NINTR\$  
 0005 NRDU\$  
 0006 NI02\$  
 0007 NI01\$  
 0010 NWDU\$  
 0011 XPRI  
 0012 XPRR  
 0013 NSTOP\$

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0000	001224	10F	0001	000027	117G	0001	000041	125G	0001	000054	137G	0000	001222	15F
0001	000101	157G	0000	001220	16F	0001	000105	164G	0001	000111	171G	0001	000117	176G
0000	001237	20F	0001	000125	201G	0001	000354	203L	0001	000145	210G	0001	000153	213G
0001	000171	221G	0001	000222	226G	0001	000230	234G	0001	000236	237G	0000	001243	25F
0001	000271	251G	0001	000301	257G	0001	000307	263G	0001	000334	272G	0000	001263	30F
0001	000355	300L	0001	000373	315G	0001	000444	333G	0001	000452	341G	0001	000460	344G
0000	001245	35F	0001	000513	356G	0001	000543	371G	0001	000551	375G	0000	001273	40F
0001	000403	400L	0000	001315	45F	0001	000620	46L	0001	000626	47L	0000	001217	5F
0000	001274	55F	0001	000636	99L	0001	000004	999L	0000 R	001152	AMON	0000 R	000105	C
0000 R	001216	DEC	0000 I	001172	I	0000 I	001200	II	0000 I	001206	IS	0000 R	001166	IX1
0000 I	001174	J	0000 I	001212	JJ	0000 I	001210	JM	0000 I	001211	JYEAR	0000 R	000000	KNOWX
0000 R	000024	KNOWY	0000 I	001202	L	0000 I	001215	LL	0000 I	001203	M	0000 I	001201	MK
0000 I	001176	MN	0000 I	001204	N	0000 R	001167	NDELTA	0000 I	001177	NN	0000 I	001175	NP
0000 I	001171	NPOINT	0000 I	001205	NS	0000 I	001214	NUN	0000 I	001170	NYEAR	0000 I	001173	NYGEN
0000 R	001141	STD	0000 R	001207	STDMIN	0000 R	000050	SUMX	0000 R	000074	SUMXY	0000 R	001213	YUN
0000 R	000751	YUNK												

00100	1*	C	THIS PROGRAM IS USED FOR FINDING THE POLYNOMIAL EQUATION	000000
00100	2*	C	BY LEAST SQUARE METHOD	000000
00101	3*		DIMENSION KNOWX(20), KNOWY(20), SUMX(20),SUMXY(9)	000000
00103	4*		DIMENSION C(20,21),YUNK(120),STD(9),AMON(12)	000001
00104	5*		DATA AMON/'JAN', 'FEB', 'MAR', 'APR', 'MAY', 'JUN', 'JUL', 'AUG', 'SEP',	000001
00104	6*		*'OCT', 'NOV', 'DEC'/'	000001
00106	7*		REAL IX1,NDELTA	000001
00107	8*		IMPLICIT REAL(K)	000001
00107	9*	C	KNOWX = INPUT OF X DATA	000001
00107	10*	C	KNOWY = INPUT OF Y DATA	000001
00107	11*	C	IX1 = THE REQUIRED VALUE OF Y STARTS FROM IX1	000001
00107	12*	C	NDELTA = INCREMENT OF IX1	000001
00107	13*	C	NPOINT = NUMBER OF POINTS	000001
00107	14*	C	SUMX(1) = NUMBER OF POINTS (INPUT)	000001
00107	15*	C	SUMX(2) = SUMMATION OF KNOWX	000001
00107	16*	C	SUMX(3) = SUMMATION OF KNOWX SQUARE	000001
00107	17*	C	SUMX(N) = SUMMATION OF KNOWX WITH (N-1)TH POWER	000001



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00107 18* C STD = STANDARD ERROR OF ESTIMATE 000001
00107 19* C NYGEN = NUMBER OF REQUIRED GENERATION 000001
00107 20* C NYEAR = NUMBER OF THE BEGINNING OF YEAR 000001
00110 21* NYEAR=2517 000001
00111 22* 999 READ(5,5,END=99)NPOINT 000004
00114 23* 5 FORMAT(I2) 000012
00115 24* READ(5,15) (KNOWX(I),I=1,NPOINT) 000012
00123 25* READ(5,16) (KNOWY(I),I=1,NPOINT) 000032
00131 26* 16 FORMAT(11F5.0) 000044
00132 27* 15 FORMAT(11F5.2) 000044
00133 28* WRITE(6,10) 000044
00135 29* 10 FORMAT(1H1,/,/30X,'INPUT X',20X,'INPUT Y'/30X, 000054
00135 30* *7(1H=),20X,7(1H=)) 000054
00136 31* DO 1 I=1,NPOINT 000054
00141 32* WRITE(6,20)KNOWX(I),KNOWY(I) 000054
00145 33* 20 FORMAT(30X,F7.2,20X,F7.0) 000063
00146 34* 1 CONTINUE 000063
00150 35* READ(5,25)IX1,NDELTA,NYGEN 000063
00155 36* 25 FORMAT(2F3.2,I3) 000073
00156 37* DO 11 I=1,9 000073
00161 38* 11 SUMXY(I)=0.0 000101
00163 39* DO 21 I=1,20 000105
00166 40* 21 SUMX(I)=0.0 000105
00170 41* DO 31 I=1,NPOINT 000111
00173 42* 31 SUMXY(1)=SUMXY(1)+KNOWY(I) 000111
00175 43* DO 41 I=2,9 000117
00200 44* DO 41 J=1,NPOINT 000125
00203 45* 41 SUMXY(I)=SUMXY(I)+KNOWY(J)*KNOWX(J)**(I-1) 000125
00206 46* SUMX(1) =NPOINT 000140
00207 47* DO 51 I=2,20 000145
00212 48* DO 51 J=1,NPOINT 000153
00215 49* 51 SUMX(I)=SUMX(I)+KNOWX(J)**(I-1) 000153
00220 50* DO 61 NP=1,8 000171
00223 51* MN = NP+1 000171
00224 52* NN =NP+2 000174
00225 53* DO 71 II=1,MN 000202
00230 54* 71 C(II,NN) =SUMXY(II) 000222
00232 55* MK=0 000224
00233 56* DO 81 L=1,MN 000230
00236 57* DO 91 M=1,MN 000236
00241 58* 91 C(M,L)=SUMX(M+MK) 000236
00243 59* 81 MK=MK+1 000240
00245 60* CALL SOLVE(C,MN) 000247
00246 61* WRITE(6,35)NP,(C(I,NN),I=1,MN) 000253
00255 62* 35 FORMAT(/5X,I5,'TH DEGREE AND COEFFICIENTS ARE',//5X,4F30.15//5X, 000301
00255 63* *4F30.15//5X,4F30.15) 000301
00256 64* DO 200 N=1,NPOINT 000301
00261 65* YUNK(N)=C(1,NN) 000301
00262 66* DO 200 NS=2,MN 000307
00265 67* 200 YUNK(N)=YUNK(N)+C(NS,NN)*KNOWX(N)**(NS-1) 000307
00265 68* C FIND STANDARD ERROR OF ESTIMATE 000307
00270 69* STD(NP)=0.0 000330
00271 70* DO 201 IS=1,NPOINT 000334
00274 71* 201 STD(NP)=STD(NP)+(KNOWY(IS)-YUNK(IS))**2 000335
00276 72* IF(STD(NP))202,203,202 000341
00301 73* 202 STD(NP)=(STD(NP)/NPOINT)**0.5 000343
00302 74* GOTO 300 000352
00303 75* 203 STD(NP)=0.0 000354
00304 76* 300 WRITE(6,30)STD(NP) 000355
00307 77* 30 FORMAT(/10X,'STANDARD ERROR OF ESTIMATE ',3X,F15.5) 000364

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T.C.S. FORM

6/11/61

00311	78*	61 CONTINUE	000364
00312	79*	STDMIN=STD(1)	000364
00313	80*	NP=1	000366
00314	81*	DO 400 JM=2,8	000373
00317	82*	IF (ABS(STDMIN)-ABS(STD(JM)))400,400,401	000373
00322	83*	401 NP=JM	000400
00323	84*	400 STDMIN=STD(JM)	000403
00325	85*	WRITE(6,40)	000406
00327	86*	40 FORMAT(1H1)	000413
00330	87*	MN=NP+1	000413
00331	88*	NN=NP+2	000416
00332	89*	DO 500 II=1,MN	000424
00335	90*	500 C(II,NN)=SUMXY(II)	000444
00337	91*	MK=0	000446
00340	92*	DO 501 L=1,MN	000452
00343	93*	DO 502 M=1,MN	000460
00346	94*	502 C(M,L)=SUMX(M+MK)	000460
00350	95*	501 MK=MK+1	000462
00352	96*	CALL SOLVE(C,MN)	000471
00353	97*	WRITE(6,35)NP,(C(I,NN),I=1,MN)	000475
00362	98*	WRITE(6,55)	000516
00364	99*	55 FORMAT(1H1,19X,'XDATA',15X,'YDATA',5X,'MONTH',7X,'YEAR',	000523
00364	100*	*/20X,5(1H-),15X,5(1H-),5X,5(1H-),7X,4(1H-))	000523
00365	101*	L = 1	000523
00366	102*	JYEAR = NYEAR	000525
00367	103*	JJ=IX1*100	000527
00370	104*	DO 101 N=1,NYGEN	000543
00373	105*	YUN =C(1,NN)	000543
00374	106*	DO 111 NS=2,MN	000551
00377	107*	111 YUN = YUN+C(NS,NN)*IX1**(NS-1)	000551
00401	108*	NUN=YUN	000565
00402	109*	LL = JJ-12*(L-1)	000574
00403	110*	WRITE(6,45)IX1,NUN,AMON(LL),JYEAR	000601
00411	111*	45 FORMAT(/20X,F5.2,11X,I9,6X,A3,6X,I6)	000613
00412	112*	DATA DEC/'DEC'/	000613
00414	113*	IF(AMON(LL).EQ,DEC)60 TO 46	000613
00416	114*	60 TO 47	000616
00417	115*	46 JYEAR = JYEAR+1	000620
00420	116*	L = L+1	000622
00421	117*	47 IX1=IX1+NDELTA	000626
00422	118*	JJ = JJ+1	000630
00423	119*	101 CONTINUE	000634
00425	120*	60 TO 999	000634
00426	121*	99 STOP	000636
00427	122*	END	000641

END OF COMPILATION

NO DIAGNOSTICS.

SUBROUTINE SOLVE ENTRY POINT 000116

STORAGE USED CODE(1) 000132; DATA(0) 000033; BLANK COMMON(2) 000000

EXTERNAL REFERENCES (BLOCK, NAME)

0003 NERR3\$

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0001	000014	1066	0001	000040	1126	0001	000047	1176	0001	000064	1256	0001	000071	3L
0000	I	000001	I	0000	000006	INJP\$	0000	I	000003	J	0000	I	000004	K
0000	I	000000	NC						0000	I	000002	M		

00100	1*	C	THIS PROGRAM IS USED FOR LINEAR EQUATION	000005
00101	2*		SUBROUTINE SOLVE (C,NR)	000005
00103	3*		DIMENSION C(20,21)	000005
00104	4*		NC=NR+1	000005
00105	5*		DO 3 I=1,NR	000014
00110	6*		M = I+1	000021
00111	7*		DO 7 J=M,NC	000024
00114	8*	7	C(I,J)=C(I,J)/C(I,I)	000040
00116	9*		DO 3 J = 1,NR	000047
00121	10*		IF(J-I)22,3,22	000053
00124	11*	22	DO 2 K =M,NC	000064
00127	12*	2	C(J,K)=C(J,K)-C(J,I)*C(I,K)	000064
00131	13*	3	CONTINUE	000076
00134	14*		RETURN	000076
00135	15*		END	000131

END OF COMPILATION NO DIAGNOSTICS.



INPUT X *****	INPUT Y *****
.01	6560.
.07	6955.
.13	7650.
.19	8560.
.25	9460.
.31	9910.
.37	10280.
.43	11050.
.49	12200.
.52	12675.
.54	12900.

1TH DEGREE AND COEFFICIENTS ARE

6218.208374023437499      12024.080932617187491

STANDARD ERROR OF ESTIMATE      210.50220

2TH DEGREE AND COEFFICIENTS ARE

6410.256530761718743      9845.740234374999993      3802.892822265624994

STANDARD ERROR OF ESTIMATE      187.06047

3TH DEGREE AND COEFFICIENTS ARE

6263.717529296874992      13627.729248046874981      -13817.885253906249994      21165.743164062499992

STANDARD ERROR OF ESTIMATE      172.29740

4TH DEGREE AND COEFFICIENTS ARE

6489.195373535156242      2762.742187499999998      80715.849609374999961      -251068.781249999999410

247958.154296874999900

STANDARD ERROR OF ESTIMATE      128.59862

5TH DEGREE AND COEFFICIENTS ARE

6690.150390624999997      -12691.236938476562492      291405.457031249999710      -1294392.625000000000200

2393127.968749999997400      -1557684.062499999997400

STANDARD ERROR OF ESTIMATE      84.60306

6TH DEGREE AND COEFFICIENTS ARE

6443.559997558593738      13073.339599609374970      -197440.894531249999800      2273883.062500000000200

-9684984.499999999994400      17559564.499999999990000      -11448643.999999999991000

STANDARD ERROR OF ESTIMATE      28.80778



7TH DEGREE AND COEFFICIENTS ARE

6543.425781249999993	1801.826904296874997	48008.335937499999930	103195.40624999999910
-113034.124999999999830	-4763286.750000000000400	14909665.99999999983000	-12416676.74999999983000

STANDARD ERROR OF ESTIMATE 35.37359

8TH DEGREE AND COEFFICIENTS ARE

6433.087280273437495	15331.808837890624984	-264738.562499999999920	2915879.843749999995100
-11763388.874999999990000	16067802.249999999994000	11407887.99999999980000	-46372645.99999999923000
29977769.249999999990000			

STANDARD ERROR OF ESTIMATE 20.43297

TCS FORM

21b.





8TH DEGREE AND COEFFICIENTS ARE

6433.087280273437495	15331.808837890624984	-264738.562499999999920	2915879.843749999995100
-11763388.874999999990000	16067802.24999999994000	11407887.99999999980000	-46372645.99999999923000
29977769.24999999990000			

TCS FORM



XDATA -----	YDATA -----	MONTH -----	YEAR -----
.01	6562	JAN	2517
.02	6655	FEB	2517
.03	6724	MAR	2517
.04	6780	APR	2517
.05	6833	MAY	2517
.06	6890	JUN	2517
.07	6954	JUL	2517
.08	7031	AUG	2517
.09	7121	SEP	2517
.10	7226	OCT	2517
.11	7345	NOV	2517
.12	7478	DEC	2517
.13	7623	JAN	2518
.14	7778	FEB	2518
.15	7940	MAR	2518
.16	8107	APR	2518
.17	8276	MAY	2518
.18	8445	JUN	2518
.19	8610	JUL	2518
.20	8770	AUG	2518
.21	8923	SEP	2518
.22	9066	OCT	2518
.23	9199	NOV	2518
.24	9322	DEC	2518
.25	9433	JAN	2519
.26	9532	FEB	2519
.27	9622	MAR	2519
.28	9701	APR	2519
.29	9772	MAY	2519



.30	9837	JUN	2519
.31	9897	JUL	2519
.32	9955	AUG	2519
.33	10013	SEP	2519
.34	10074	OCT	2519
.35	10139	NOV	2519
.36	10211	DEC	2519
.37	1029N	JAN	M52
.38	10386	FEB	2520
.39	10492	MAR	2520
.40	10611	APR	2520
.41	10745	MAY	2520
.42	10892	JUN	2520
.43	11054	JUL	2520
.44	11228	AUG	2520
.45	11412	SEP	2520
.46	11603	OCT	2520
.47	11799	NOV	2520
.48	11995	DEC	2520
.49	12186	JAN	2521
.50	12368	FEB	2521
.51	12536	MAR	2521
.52	12684	APR	2521
.53	12806	MAY	2521
.54	12898	JUN	2521
.55	12955	JUL	2521
.56	12974	AUG	2521
.57	12954	SEP	2521
.58	12895	OCT	2521
.59	12799	NOV	2521



.60	12673	DEC	2521
.61	12527	JAN	2522
.62	12375	FEB	2522
.63	12236	MAR	2522
.64	12139	APR	2522
.65	12117	MAY	2522
.66	12213	JUN	2522
.67	12479	JUL	2522



INPUT X =====	INPUT Y =====
.07	11761.
.13	11884.
.17	12062.
.21	12686.
.26	13518.
.33	14302.
.37	14744.
.41	15136.
.45	15526.
.51	15743.
.53	15862.

1TH DEGREE AND COEFFICIENTS ARE

10746.876708984374982      10176.848022460937490

STANDARD ERROR OF ESTIMATE      242.53617

2TH DEGREE AND COEFFICIENTS ARE

10511.023193359374981      12189.718139648437491      -3280.712829589843746

STANDARD ERROR OF ESTIMATE      234.59822

3TH DEGREE AND COEFFICIENTS ARE

11983.694213867187493      -9155.774658203124994      78108.067382812499963      -89230.049804687499963

STANDARD ERROR OF ESTIMATE      93.94518

4TH DEGREE AND COEFFICIENTS ARE

12909.822753906249984      -28915.828369140624990      206780.044921874999810      -409852.824218749999630

268817.769531249999530

STANDARD ERROR OF ESTIMATE      64.28850

5TH DEGREE AND COEFFICIENTS ARE

13523.780029296875002\*      -45395.173828124999950      355916.65624999999520      -1003654.039062499999000

1341045.765624999998200      -717244.187499999999840

STANDARD ERROR OF ESTIMATE      61.73037

6TH DEGREE AND COEFFICIENTS ARE

13453.303955078124974      -43222.472656249999933      331726.640624999999420      -874953.570312499999800

987872.343749999999630      -235154.945312499999600      -259006.826171874999420

STANDARD ERROR OF ESTIMATE      61.48165



7TH DEGREE AND COEFFICIENTS ARE

12863.657958984374982	-25536.909667968749971	146692.171874999999910	-17046.929687499999973
-668750.9531249999999520	-109078.4550781249999900	3342755.3437499999994000	-3313941.3124999999996400

STANDARD ERROR OF ESTIMATE 60.25267

8TH DEGREE AND COEFFICIENTS ARE

12850.393798828124974	-22846.647216796874993	80271.1777343749999940	573731.7812499999999620
-2851542.7812499999997200	1924261.9531249999998000	10821310.4999999999991000	-23478170.4999999999982000
14072595.7499999999983000			

STANDARD ERROR OF ESTIMATE 57.45823

TCS FORM



8TH DEGREE AND COEFFICIENTS ARE

12850.393798828124974	-22846.647216796874993	80271.177734374999940	573731.781249999999620
-2851542.781249999997200	1924261.953124999998000	10821310.49999999991000	-23478170.49999999982000
14072595.74999999983000			



XDATA

YDATA

MONTH

YEAR

-----

-----

-----

-----

.01

12630

JAN

2517

.02

12429

FEB

2517

.03

12250

MAR

2517

.04

12094

APR

2517

.05

11963

MAY

2517

.06

11857

JUN

2517

.07

11777

JUL

2517

.08

11722

AUG

2517

.09

11691

SEP

2517

.10

11684

OCT

2517

.11

11700

NOV

2517

.12

11737

DEC

2517

.13

11793

JAN

2518

.14

11866

FEB

2518

.15

11955

MAR

2518

.16

12057

APR

2518

.17

12171

MAY

2518

.18

12294

JUN

2518

.19

12425

JUL

2518

.20

12563

AUG

2518

.21

12704

SEP

2518

.22

12848

OCT

2518

.23

12994

NOV

2518

.24

13139

DEC

2518

.25

13284

JAN

2519

.26

13426

FEB

2519

.27

13567

MAR

2519

.28

13704

APR

2519

.29

13837

MAY

2519





.30	13967	JUN	2519
.31	14093	JUL	2519
.32	14214	AUG	2519
.33	14332	SEP	2519
.34	14446	OCT	2519
.35	14557	NOV	2519
.36	14664	DEC	2519
.37	14767	JAN	252
.38	14868	FEB	2520
.39	14965	MAR	2520
.40	15058	APR	2520
.41	15149	MAY	2520
.42	15236	JUN	2520
.43	15319	JUL	2520
.44	15398	AUG	2520
.45	15472	SEP	2520
.46	15541	OCT	2520
.47	15604	NOV	2520
.48	15661	DEC	2520
.49	15711	JAN	2521
.50	15753	FEB	2521
.51	15789	MAR	2521
.52	15817	APR	2521
.53	15838	MAY	2521
.54	15855	JUN	2521
.55	15868	JUL	2521
.56	15882	AUG	2521
.57	15899	SEP	2521
.58	15926	OCT	2521
.59	15971	NOV	2521



.60	16042	DEC	2521
.61	16152	JAN	2522
.62	16315	FEB	2522
.63	16550	MAR	2522
.64	16876	APR	2522
.65	17321	MAY	2522
.66	17914	JUN	2522
.67	18692	JUL	2522

FIN

## ประวัติผู้เขียน

ชื่อ นางสาวอภิเพ็ญ นันทากิจวัจน์ เกิดเมื่อวันที่ ๑๘ เมษายน ๒๕๕๗ ได้รับ  
ปริญญาวิทยาศาสตรบัณฑิต สาขาคณิตศาสตร์ จาก คณะวิทยาศาสตร์ มหาวิทยาลัยรามคำแหง  
เมื่อ พ.ศ. ๒๕๖๘ ปัจจุบันทำงานเป็นวิทยากรอันดับ ๑ กองวางแผนพัฒนาแหล่งน้ำ  
ฝ่ายวางโครงการและแผนงาน การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย.