

หนังสืออ้างอิง

- จิรยุทธ อรรถจินดา 2516, ชั่วโมงและระยะทางในการบินลำเลียง ศูนย์ควบคุม
การลำเลียงทางอากาศ คอนเมือง.
- ปัญญา เสียงเจริญ 2517, การใช้ระเบียบวิธีสถิติแก้ปัญหการลำเลียงทางอากาศ
ของกองทัพอากาศไทย (The Use of Statistical Methods
in Solving Air Transportation Problems in the
Royal Thai Air Force) วิทยานิพนธ์ปริญญาโทบัณฑิต แผนก
สถิติ จุฬาลงกรณ์มหาวิทยาลัย (อัครสำเนา).
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โดย เอกชัย ชัยประเสริฐสิทธิ์ กรุงเทพฯ : ไทยวัฒนาพานิช.
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ถ่วงน้ำหนักแบบเอกโพเนนเชียล (Forecasting Bank Deposite
by Exponential Weighted Moving Average) วิทยานิพนธ์
ปริญญาโทบัณฑิตแผนกสถิติ จุฬาลงกรณ์มหาวิทยาลัย (อัครสำเนา).
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ภาคผนวก

ผนวก ก.

โปรแกรม และ ผลลัพธ์ ของ การหาค่าตอบที่ดีที่สุดของจำนวนเครื่องบินลำเดียว


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1REM WANG 2200; RTAF. ACADEMY
2REM FORECAST FOR TRAINING HOURS OF C-47 IN DEC. 2523
3REM BY VORAPOT KHOMPIS
40DIM Y(36), M(32), N(32)
50FOR J=1TO 36:READ Y(J):NEXT J
60DATA 165, 162, 156, 158, 152, 151, 154, 156, 166, 171, 178, 174
70DATA 175, 174, 177, 173, 174, 178, 189, 181, 183, 189, 206, 196
80DATA 207, 215, 210, 218, 208, 211, 205, 209, 213, 212, 197, 222
90FOR I=1TO 32:J=I
100M(I)=(Y(J)+Y(J+1)+Y(J+2)+Y(J+3)+Y(J+4))/5
110N(I)=M(I)*I
120NEXT I
130 L, J, A, B, K=0
140 FOR T=1TO 32
150 A=A+T: B=B+T^2: L=L+N(T)
160 K=K+M(T): NEXT T
170 B1=(32*L-A*K)/(32+B-A^2)
180 A1=(K/32)-((B1*A)/32)
190 F=A1+94*B1
200PRINT HEX(0E); "*****"
210PRINT
220PRINT TAB(12); "FORECAST FOR TRAINING HOURS OF C-47 IN DEC. 2523"
230PRINT
240PRINT TAB(12); "BY MOVING AVERAGE AND LINEAR REGRESSION METHOD"
250PRINT :PRINT
260PRINT TAB(8); "DATA          YI          XI          XI^2          XI.YI"
270PRINT TAB(8); Y(1):PRINT TAB(8); Y(2)
280FOR I=1TO 32:J=I
290PRINTUSING 192, Y(J+2), M(I), I, I^2, N(I)
300%          ###          ###. ##          ##          #####          #####. ##
310NEXT I
320PRINT TAB(8); Y(35):PRINT TAB(8); Y(36)
330PRINT TAB(8); "*****"
340PRINTUSING 209, K, A, B, L
350%          SUMMATION  #####. ##          #####          #####          #####. ##
360PRINT TAB(8); "*****"
370PRINT
380PRINT TAB(8); "B = (N(S. XI. YI)-(S. XI)(S. YI))/(N(S. XI^2)-(S. XI)^2)"
390PRINTUSING 214, L, -A, K, B, -A^2, B1
400%          = (32*#####. ##-#####. ##)/(32*#####-#####) = #. #####
410PRINT TAB(8); "A = (S. YI)/N - B*(S. XI)/N"
420PRINTUSING 218, K, B1, A, A1
430%          = (#####. ##/32)-((#. #####)/32) = ###. #####:PRINT
440PRINT
450PRINT TAB(12); "FORECAST FOR TRAINING HOURS OF C-47 IN DEC. 2523"
460PRINT
470PRINT TAB(20); "Y = A+X*B":PRINT
480PRINTUSING 236, A1, B1
490%          = ###. #####+94*#. #####
500PRINT
510PRINT HEX(0E); TAB(8); "#Y = "; F; "HRS. "
520PRINT HEX(0E); "*****"
530END

```

FORECAST FOR TRAINING HOURS OF C-47 IN DEC. 2523

BY MOVING AVERAGE AND LINEAR REGRESSION METHOD

| DATA | YI | XI | XI ² | XI.YI |
|------|--------|----|-----------------|---------|
| 165 | | | | |
| 162 | | | | |
| 156 | 158.60 | 1 | 1 | 158.60 |
| 158 | 155.80 | 2 | 4 | 311.60 |
| 152 | 154.20 | 3 | 9 | 462.60 |
| 151 | 154.20 | 4 | 16 | 616.80 |
| 154 | 155.80 | 5 | 25 | 779.00 |
| 156 | 159.60 | 6 | 36 | 957.60 |
| 166 | 165.00 | 7 | 49 | 1155.00 |
| 171 | 169.00 | 8 | 64 | 1352.00 |
| 178 | 172.80 | 9 | 81 | 1555.20 |
| 174 | 174.40 | 10 | 100 | 1744.00 |
| 175 | 175.60 | 11 | 121 | 1931.60 |
| 174 | 174.60 | 12 | 144 | 2095.20 |
| 177 | 174.60 | 13 | 169 | 2269.80 |
| 173 | 175.20 | 14 | 196 | 2452.80 |
| 174 | 178.20 | 15 | 225 | 2673.00 |
| 178 | 179.00 | 16 | 256 | 2864.00 |
| 189 | 181.00 | 17 | 289 | 3077.00 |
| 181 | 184.00 | 18 | 324 | 3312.00 |
| 183 | 189.60 | 19 | 361 | 3602.40 |
| 189 | 191.00 | 20 | 400 | 3820.00 |
| 206 | 196.20 | 21 | 441 | 4120.20 |
| 196 | 202.60 | 22 | 484 | 4457.20 |
| 207 | 206.80 | 23 | 529 | 4756.40 |
| 215 | 209.20 | 24 | 576 | 5020.80 |
| 210 | 211.60 | 25 | 625 | 5290.00 |
| 218 | 212.40 | 26 | 676 | 5522.40 |
| 208 | 210.40 | 27 | 729 | 5680.80 |
| 211 | 210.20 | 28 | 784 | 5885.60 |
| 205 | 209.20 | 29 | 841 | 6066.80 |
| 209 | 210.00 | 30 | 900 | 6300.00 |
| 213 | 207.20 | 31 | 961 | 6423.20 |
| 212 | 210.60 | 32 | 1024 | 6739.20 |
| 197 | | | | |
| 222 | | | | |

 SUMMATION 5918.60 528 11440 103452.80
 #####

$$B = (N(S.XI.YI) - (S.XI)(S.YI)) / (N(S.XI^2) - (S.XI)^2)$$

$$= (32 * 103452.80 - 528 * 5918.60) / (32 * 11440 - 278784) = 2.12459$$

$$A = (S.YI) / N - B * (S.XI) / N$$

$$= (5918.60 / 32) - ((2.12459 * 528) / 32) = 149.90040$$

FORECAST FOR TRAINING HOURS OF C-47 IN DEC. 2523

$$Y = A + X * B$$

$$= 149.90040 + 94 * 2.12459$$

#Y = 349.61250000001 HRS.

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1REM WANG 2200; RTAF. ACADEMY
2REM FORECAST FOR OPERATION HOURS OF C-47 IN DEC. 2523
3REM BY VORAPOT KHOMPIS
10DIM Y(36),M(32),N(32)
20FOR J=1TO 36:READ Y(J):NEXT J
30DATA 233, 247, 243, 249, 245, 255, 250, 248, 255, 252, 256, 258
31DATA 260, 266, 267, 266, 264, 271, 267, 270, 275, 273, 275, 276
32DATA 275, 270, 273, 274, 268, 276, 277, 279, 283, 282, 285, 291
50FOR I=1TO 32:J=I
70M(I)=(Y(J)+Y(J+1)+Y(J+2)+Y(J+3)+Y(J+4))/5
80N(I)=M(I)*I
90NEXT I
95 L, J, A, B, K=0
100 FOR T=1TO 32
110 A=A+T:B=B+T^2:L=L+N(T)
130K=K+M(T):NEXT T
150 B1=(32*L-A*K)/(32*B-A^2)
155 A1=(K/32)-((B1*A)/32)
160 F=A1+94*B1
165PRINT HEX(0E); "*****":PRINT
170PRINT TAB(12); "FORECAST FOR OPERATION HOURS OF C-47 IN DEC. 2523"
171PRINT
173PRINT TAB(12); "BY MOVING AVERAGE AND LINEAR REGRESSION METHOD"
174PRINT :PRINT
175PRINT TAB(8); "DATA          YI          XI          XI^2          XI.YI"
176PRINT TAB(8); Y(1):PRINT TAB(8); Y(2)
180FOR I=1TO 32:J=I
190PRINTUSING 192, Y(J+2), M(I), L, I^2, N(I)
192%          ###          ###.##          ##          #####          #####.##
200NEXT I
202PRINT TAB(8); Y(35):PRINT TAB(8); Y(36)
205PRINT TAB(8); "*****"
207PRINTUSING 209, K, A, B, L
209%          SUMMATION  #####.##          #####          #####          #####.##
210PRINT TAB(8); "*****"
211PRINT
212PRINT TAB(8); "B = (N(S. XI. YI)-(S. XI)(S. YI))/(N(S. XI^2)-(S. XI)^2)"
213PRINTUSING 214, L, -A, K, B, -A^2, B1
214%          = (32*#####.##-#####.##)/(32*#####-#####) = #.#####
215PRINT TAB(8); "A = (S. YI)/N - B*(S. XI)/N"
217PRINTUSING 218, K, B1, A, A1
218%          = (#####.##/32)-((#.#####+###)/32) = ###.#####:PRINT
220PRINT
225 PRINT TAB(12); "FORECAST FOR OPERATION HOURS OF C-47 IN DEC. 2523"
226PRINT
232PRINT TAB(20); "Y = A+X*B":PRINT
234PRINTUSING 236, A1, B1
236%          = (###.#####+94*#.#####)
238PRINT
240PRINT HEX(0E); TAB(8); "#Y = "; F; "HRS. ":PRINT
245PRINT HEX(0E); "*****"
250END

```

 FORECAST FOR OPERATION HOURS OF C-47 IN DEC. 2523

BY MOVING AVERAGE AND LINEAR REGRESSION METHOD

| DATA | YI | XI | XI ² | XI * YI |
|------|--------|----|-----------------|---------|
| 233 | | | | |
| 247 | | | | |
| 243 | 243.40 | 1 | 1 | 243.40 |
| 249 | 247.80 | 2 | 4 | 495.60 |
| 245 | 248.40 | 3 | 9 | 745.20 |
| 255 | 249.40 | 4 | 16 | 997.60 |
| 250 | 250.60 | 5 | 25 | 1253.00 |
| 248 | 252.00 | 6 | 36 | 1512.00 |
| 255 | 252.20 | 7 | 49 | 1765.40 |
| 252 | 253.80 | 8 | 64 | 2030.40 |
| 256 | 256.20 | 9 | 81 | 2305.80 |
| 258 | 258.40 | 10 | 100 | 2584.00 |
| 260 | 261.40 | 11 | 121 | 2875.40 |
| 266 | 263.40 | 12 | 144 | 3160.80 |
| 267 | 264.60 | 13 | 169 | 3439.80 |
| 266 | 266.80 | 14 | 196 | 3735.20 |
| 264 | 267.00 | 15 | 225 | 4005.00 |
| 271 | 267.60 | 16 | 256 | 4281.60 |
| 267 | 269.40 | 17 | 289 | 4579.80 |
| 270 | 271.20 | 18 | 324 | 4881.60 |
| 275 | 272.00 | 19 | 361 | 5168.00 |
| 273 | 273.80 | 20 | 400 | 5476.00 |
| 275 | 274.80 | 21 | 441 | 5770.80 |
| 276 | 273.80 | 22 | 484 | 6023.60 |
| 275 | 273.80 | 23 | 529 | 6297.40 |
| 270 | 273.60 | 24 | 576 | 6566.40 |
| 273 | 272.00 | 25 | 625 | 6800.00 |
| 274 | 272.20 | 26 | 676 | 7077.20 |
| 268 | 273.60 | 27 | 729 | 7387.20 |
| 276 | 274.80 | 28 | 784 | 7694.40 |
| 277 | 276.60 | 29 | 841 | 8021.40 |
| 279 | 279.40 | 30 | 900 | 8382.00 |
| 283 | 281.20 | 31 | 961 | 8717.20 |
| 282 | 284.00 | 32 | 1024 | 9088.00 |
| 285 | | | | |
| 291 | | | | |

 SUMMATION 8499.20 528 11440 143361.20
 #####

$$B = (N(S.XI.YI) - (S.XI)(S.YI)) / (N(S.XI^2) - (S.XI)^2)$$

$$= (32*143361.20 - 528*8499.20) / (32*11440 - 278784) = 1.14530$$

$$A = (S.YI)/N - B*(S.XI)/N$$

$$= (8499.20/32) - ((1.14530*528)/32) = 246.70241$$

FORECAST FOR OPERATION HOURS OF C-47 IN DEC. 2523

$$Y = A + X * B$$

$$= (246.70241 + 94 * 1.14530)$$

#Y = 354.3613636365 HRS.


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1REM WANG 2200: RTAF. ACADEMY
2REM FORECAST FOR TRAINING HOURS OF C-123B IN DEC. 2523
3REM BY VORAPOT KHOMPIS
40DIM Y(36),M(32),N(32)
50FOR J=1TO 36:READ Y(J):NEXT J
60DATA 50, 52, 48, 52, 54, 57, 55, 64, 56, 60, 55, 58
70DATA 57, 60, 64, 62, 59, 69, 61, 60, 69, 70, 80, 85
80DATA 95, 93, 101, 103, 110, 106, 113, 114, 118, 121, 120, 125
90FOR I=1TO 32:J=I
100M(I)=(Y(J)+Y(J+1)+Y(J+2)+Y(J+3)+Y(J+4))/5
110N(I)=M(I)*I
120NEXT I
130 L, J, A, B, K=0
140 FOR T=1TO 32
150 A=A+T: B=B+T^2: L=L+N(T)
160 K=K+M(T): NEXT T
170 B1=(32*L-A*K)/(32*B-A^2)
180 A1=(K/32)-((B1*A)/32)
190 F=A1+94*B1
200PRINT HEX(0E); "*****"
210PRINT
220PRINT TAB(12); "FORECAST FOR TRAINING HOURS OF C-123B IN DEC. 2523"
230PRINT
240PRINT TAB(12); "BY MOVING AVERAGE AND LINEAR REGRESSION METHOD"
250PRINT :PRINT
260PRINT TAB(8); " DATA          YI          XI          XI^2          XI.YI"
270PRINT TAB(9); Y(1):PRINT TAB(9); Y(2)
280FOR I=1TO 32:J=I
290PRINTUSING 192, Y(J+2), M(I), I, I^2, N(I)
300%          ###          ###. ##          ##          #####          #####. ##
310NEXT I
320PRINT TAB(8); Y(35):PRINT TAB(8); Y(36)
330PRINT TAB(8); "*****"
340PRINTUSING 209, K, A, B, L
350%          SUMMATION  #####. ##          #####          #####          #####. ##
360PRINT TAB(8); "*****"
370PRINT TAB(8); "B = (N(S. XI. YI)-(S. XI)(S. YI))/(N(S. XI^2)-(S. XI)^2)"
380PRINTUSING 214, L, -A, K, B, -A^2, B1
390%          = (32+#####. ##-#####. ##)/(32+#####-#####) = #. #####
400PRINT TAB(8); "A = (S. YI)/N - B*(S. XI)/N"
410PRINTUSING 218, K, B1, A, A1
420%          = (#####. ##/32)-((#. #####)/32) = ###. #####:PRINT
430PRINT
440PRINT TAB(12); "FORECAST FOR TRAINING HOURS OF C-123B IN DEC. 2523"
450PRINT
460PRINT TAB(20); "Y = A+X*B":PRINT
470PRINTUSING 236, A1, B1
480%          = ##. #####+94*#. #####
490PRINT
500PRINT HEX(0E); TAB(8); "#Y ="; F; "HRS. ":PRINT
510PRINT HEX(0E); "*****"
520END

```

FORECAST FOR TRAINING HOURS OF C-123B IN DEC. 2523

BY MOVING AVERAGE AND LINEAR REGRESSION METHOD

| DATA | YI | XI | XI ² | XI.YI |
|------|--------|----|-----------------|---------|
| 50 | | | | |
| 52 | | | | |
| 48 | 51.20 | 1 | 1 | 51.20 |
| 52 | 52.60 | 2 | 4 | 105.20 |
| 54 | 53.20 | 3 | 9 | 159.60 |
| 57 | 56.40 | 4 | 16 | 225.60 |
| 55 | 57.20 | 5 | 25 | 286.00 |
| 64 | 58.40 | 6 | 36 | 350.40 |
| 56 | 58.00 | 7 | 49 | 406.00 |
| 60 | 58.60 | 8 | 64 | 468.80 |
| 55 | 57.20 | 9 | 81 | 514.80 |
| 58 | 58.00 | 10 | 100 | 580.00 |
| 57 | 58.80 | 11 | 121 | 646.80 |
| 60 | 60.20 | 12 | 144 | 722.40 |
| 64 | 60.40 | 13 | 169 | 785.20 |
| 62 | 62.80 | 14 | 196 | 879.20 |
| 59 | 63.00 | 15 | 225 | 945.00 |
| 69 | 62.20 | 16 | 256 | 995.20 |
| 61 | 63.60 | 17 | 289 | 1081.20 |
| 60 | 65.80 | 18 | 324 | 1184.40 |
| 69 | 68.00 | 19 | 361 | 1292.00 |
| 70 | 72.80 | 20 | 400 | 1456.00 |
| 90 | 79.80 | 21 | 441 | 1675.80 |
| 85 | 84.60 | 22 | 484 | 1861.20 |
| 95 | 90.80 | 23 | 529 | 2088.40 |
| 93 | 95.40 | 24 | 576 | 2289.60 |
| 101 | 100.40 | 25 | 625 | 2510.00 |
| 103 | 102.60 | 26 | 676 | 2667.60 |
| 110 | 106.60 | 27 | 729 | 2878.20 |
| 106 | 109.20 | 28 | 784 | 3057.60 |
| 113 | 112.20 | 29 | 841 | 3253.80 |
| 114 | 114.40 | 30 | 900 | 3432.00 |
| 118 | 117.20 | 31 | 961 | 3633.20 |
| 121 | 119.60 | 32 | 1024 | 3827.20 |
| 120 | | | | |
| 125 | | | | |

 SUMMATION 2431.20 528 11440 46309.60
 #####

$$B = \frac{N(\sum XI \cdot YI) - (\sum XI)(\sum YI)}{N(\sum XI^2) - (\sum XI)^2}$$

$$= \frac{(32 \cdot 46309.60 - 528 \cdot 2431.20)}{(32 \cdot 11440 - 278784)} = 2.27082$$

$$A = \frac{(\sum YI)}{N} - B \cdot \frac{(\sum XI)}{N}$$

$$= \frac{(2431.20/32) - ((2.27082 \cdot 528)/32)}{1} = 38.50645$$

FORECAST FOR TRAINING HOURS OF C-123B IN DEC. 2523

$$Y = A + X \cdot B$$

$$= 38.50645 + 94 \cdot 2.27082$$

#Y = 251.9636363637 HRS.

```

1REM WANG 2200; RTAF. ACADEMY
2REM FORECAST FOR OPERATION HOURS OF C-123B IN DEC. 2523
3REM BY VORAPOT KHOMPIS
10DIM Y(36), M(32), N(32)
20FOR J=1TO 36:READ Y(J):NEXT J
30DATA 207, 213, 201, 209, 208, 202, 205, 210, 212, 209, 210, 212
31DATA 215, 217, 214, 220, 218, 225, 217, 224, 215, 227, 222, 230
32DATA 236, 246, 253, 258, 255, 261, 259, 262, 271, 276, 273, 280
50FOR I=1TO 32:J=I
70M(I)=(Y(J)+Y(J+1)+Y(J+2)+Y(J+3)+Y(J+4))/5
80N(I)=M(I)*I:NEXT I
95 L, J, A, B, K=0
100 FOR T=1TO 32
110 A=A+T:B=B+T^2:L=L+N(T)
130K=K+M(T):NEXT T
150 B1=(32*L-A*K)/(32*B-A^2)
155 A1=(K/32)-((B1*A)/32)
160 F=A1+94*B1
165PRINT HEX(0E); "*****":PRINT
170PRINT TAB(12); "FORECAST FOR OPERATION HOURS OF C-123B IN DEC. 2523"
171PRINT
173PRINT TAB(12); "BY MOVING AVERAGE AND LINEAR REGRESSION METHOD"
174PRINT :PRINT
175PRINT TAB(8); " DATA          YI          XI          XI^2          XI. YI"
176PRINT TAB(8); Y(1):PRINT TAB(8); Y(2)
180FOR I=1TO 32:J=I
190PRINTUSING 192, Y(J+2), M(I), I, I^2, N(I)
192%          ###          ###. ##          ##          #####          #####. ##
200NEXT I
202PRINT TAB(8); Y(35):PRINT TAB(8); Y(36)
205PRINT TAB(8); "*****"
207PRINTUSING 209, K, A, B, L
209%          SUMMATION  #####. ##          #####          #####          #####. ##
210PRINT TAB(8); "*****"
211PRINT
212PRINT TAB(8); "B = (N(S. XI. YI)-(S. XI)(S. YI))/(N(S. XI^2)-(S. XI)^2)"
213PRINTUSING 214, L, -A, K, B, -A^2, B1
214%          = (32*#####. ##-#####. ##)/(32*#####-#####) = #. #####
215PRINT TAB(8); "A = (S. YI)/N - B*(S. XI)/N"
217PRINTUSING 218, K, B1, A, A1
218%          = (#####. ##/32)-((#. #####+#####)/32) = ###. #####:PRINT :PRINT
225 PRINT TAB(12); "FORECAST FOR OPERATION HOURS OF C-123B IN DEC. 2523"
226PRINT
232PRINT TAB(20); "Y = A+X*B":PRINT
234PRINTUSING 236, A1, B1
236%          = ###. #####+94*#. #####
237PRINT
240PRINT HEX(0E); TAB(8); "#Y ="; F; "HRS. ":PRINT
245PRINT HEX(0E); "*****"
250END

```


FORECAST FOR OPERATION HOURS OF C-123B IN DEC. 2523

BY MOVING AVERAGE AND LINEAR REGRESSION METHOD

| DATA | YI | XI | XI ² | XI.YI |
|------|--------|----|-----------------|---------|
| 207 | | | | |
| 213 | | | | |
| 201 | 207.60 | 1 | 1 | 207.60 |
| 209 | 206.60 | 2 | 4 | 413.20 |
| 208 | 205.00 | 3 | 9 | 615.00 |
| 202 | 206.80 | 4 | 16 | 827.20 |
| 205 | 207.40 | 5 | 25 | 1037.00 |
| 210 | 207.60 | 6 | 36 | 1245.60 |
| 212 | 209.20 | 7 | 49 | 1464.40 |
| 209 | 210.60 | 8 | 64 | 1684.80 |
| 210 | 211.60 | 9 | 81 | 1904.40 |
| 212 | 212.60 | 10 | 100 | 2126.00 |
| 215 | 213.60 | 11 | 121 | 2349.60 |
| 217 | 215.60 | 12 | 144 | 2587.20 |
| 214 | 216.80 | 13 | 169 | 2818.40 |
| 220 | 218.80 | 14 | 196 | 3063.20 |
| 218 | 218.80 | 15 | 225 | 3282.00 |
| 225 | 220.80 | 16 | 256 | 3532.80 |
| 217 | 219.80 | 17 | 289 | 3736.60 |
| 224 | 221.60 | 18 | 324 | 3988.80 |
| 215 | 221.00 | 19 | 361 | 4199.00 |
| 227 | 223.60 | 20 | 400 | 4472.00 |
| 222 | 226.00 | 21 | 441 | 4746.00 |
| 230 | 232.20 | 22 | 484 | 5108.40 |
| 236 | 237.40 | 23 | 529 | 5468.20 |
| 246 | 244.60 | 24 | 576 | 5870.40 |
| 253 | 249.60 | 25 | 625 | 6240.00 |
| 258 | 254.60 | 26 | 676 | 6619.60 |
| 255 | 257.20 | 27 | 729 | 6944.40 |
| 261 | 259.00 | 28 | 784 | 7252.00 |
| 259 | 261.60 | 29 | 841 | 7586.40 |
| 262 | 265.80 | 30 | 900 | 7974.00 |
| 271 | 268.20 | 31 | 961 | 8314.20 |
| 276 | 272.40 | 32 | 1024 | 8716.80 |
| 273 | | | | |
| 280 | | | | |

 SUMMATION 7304.00 528 11440 126387.20
 #####

$$B = (N(S.XI.YI) - (S.XI)(S.YI)) / (N(S.XI^2) - (S.XI)^2)$$

$$= (32 * 126387.20 - 528 * 7304.00) / (32 * 11440 - 278784) = 2.15219$$

$$A = (S.YI) / N - B * (S.XI) / N$$

$$= (7304.00 / 32) - ((2.15219 * 528) / 32) = 192.73870$$

FORECAST FOR OPERATION HOURS OF C-123B IN DEC. 2523

$$Y = A + X * B$$

$$= 192.73870 + 94 * 2.15219$$

#Y = 395.0454545456 HRS.


```

1REM WANG 2200; RTAF. ACADEMY
2REM FORECAST FOR TRAINING HOURS OF C-123K IN DEC. 2523
3REM BY VORAPOT KHOMPIS
4DIM Y(24), M(20), N(20)
5FOR J=1TO 24:READ Y(J):NEXT J
6DATA 20, 25, 26, 25, 27, 28, 26, 29, 26, 32, 30, 35
7DATA 32, 30, 34, 36, 37, 40, 38, 42, 49, 42, 40, 46
8FOR I=1TO 20:J=I
9M(I)=(Y(J)+Y(J+1)+Y(J+2)+Y(J+3)+Y(J+4))/5
10N(I)=M(I)*I:NEXT I
11L, J, A, B, K=0
12FOR T=1TO 20
13A=A+T:B=B+T^2:L=L+N(T)
14K=K+M(T):NEXT T
15B1=(20*L-A*K)/(20*B-A^2)
16A1=(K/20)-((B1*A)/20)
17F=A1+82*B1
18PRINT HEX(0E); "*****":PRINT
19PRINT TAB(12); "FORECAST FOR TRAINING HOURS OF C-123K IN DEC. 2523"
20PRINT
21PRINT TAB(12); "BY MOVING AVERAGE AND LINEAR REGRESSION METHOD"
22PRINT :PRINT
23PRINT TAB(8); " DATA          YI          XI          XI^2          XI.YI"
24PRINT TAB(9); Y(1):PRINT TAB(9); Y(2)
25FOR I=1TO 20:J=I
26PRINTUSING 192, Y(J+2), M(I), I, I^2, N(I)
27%          ###          ###.##          ##          ####          ####.#
28NEXT I
29PRINT TAB(9); Y(23):PRINT TAB(9); Y(24)
30PRINT TAB(8); "*****"
31PRINTUSING 209, K, A, B, L
32%          SUMMATION  ####.#  #####  #####  #####.#
33PRINT TAB(8); "*****"
34PRINT TAB(8); "B = (N(S. XI. YI)-(S. XI)(S. YI))/(N(S. XI^2)-(S. XI)^2)"
35PRINTUSING 214, L, -A, K, B, -A^2, B1
36%          = (20*####.#-##*####.##)/(20*#####-#####) = #.#####
37PRINT TAB(8); "A = (S. YI)/N - B*(S. XI)/N"
38PRINTUSING 218, K, B1, A, A1
39%          = (####.##/20)-((#.#####)/20) = ##.#####
40PRINT
41PRINT TAB(12); "FORECAST FOR TRAINING HOURS OF C-123K IN DEC. 2523"
42PRINT
43PRINT TAB(20); "Y = A+X*B":PRINT
44PRINTUSING 236, A1, B1
45%          = ##.#####+82*#.#####
46PRINT
47PRINT HEX(0E); TAB(8); "#Y ="; F; "HRS. ":PRINT
48PRINT HEX(0E); "*****"
49END

```

 FORECAST FOR TRAINING HOURS OF C-123K IN DEC. 2523

BY MOVING AVERAGE AND LINEAR REGRESSION METHOD

| DATA | YI | XI | XI ² | XI.YI |
|------|-------|----|-----------------|--------|
| 20 | | | | |
| 25 | | | | |
| 26 | 24.60 | 1 | 1 | 24.60 |
| 25 | 26.20 | 2 | 4 | 52.40 |
| 27 | 26.40 | 3 | 9 | 79.20 |
| 28 | 27.00 | 4 | 16 | 108.00 |
| 26 | 27.20 | 5 | 25 | 136.00 |
| 29 | 28.20 | 6 | 36 | 169.20 |
| 26 | 28.60 | 7 | 49 | 200.20 |
| 32 | 30.40 | 8 | 64 | 243.20 |
| 30 | 31.00 | 9 | 81 | 279.00 |
| 35 | 31.80 | 10 | 100 | 318.00 |
| 32 | 32.20 | 11 | 121 | 354.20 |
| 30 | 33.40 | 12 | 144 | 400.80 |
| 34 | 33.80 | 13 | 169 | 439.40 |
| 36 | 35.40 | 14 | 196 | 495.60 |
| 37 | 37.00 | 15 | 225 | 555.00 |
| 40 | 38.60 | 16 | 256 | 617.60 |
| 38 | 41.20 | 17 | 289 | 700.40 |
| 42 | 42.20 | 18 | 324 | 759.60 |
| 49 | 42.20 | 19 | 361 | 801.80 |
| 42 | 43.80 | 20 | 400 | 876.00 |
| 40 | | | | |
| 46 | | | | |

 SUMMATION 661.20 210 2870 7610.20
 #####

$$B = \frac{N(\sum X_i Y_i) - (\sum X_i)(\sum Y_i)}{N(\sum X_i^2) - (\sum X_i)^2}$$

$$= \frac{(20 \times 7610.20 - 210 \times 661.20)}{(20 \times 2870 - 44100)} = 1.00390$$

$$A = \frac{(\sum Y_i)}{N} - B \frac{(\sum X_i)}{N}$$

$$= \frac{661.20}{20} - \left(\frac{1.00390 \times 210}{20} \right) = 22.51894$$

FORECAST FOR TRAINING HOURS OF C-123K IN DEC. 2523

$$Y = A + X \cdot B$$

$$= 22.51894 + 82 \times 1.00390$$

$$\#Y = 104.8395488721 \text{ HRS.}$$

```

1REM WANG 2200;RTAF. ACADEMY
2REM FORECAST FOR OPERATION HOURS OF C-123K IN DEC. 2523
3REM BY VORAPOT KHOMPIS
4DIM Y(24),M(20),N(20)
5FOR J=1TO 24:READ Y(J):NEXT J
6DATA 6,9,9,6,9,7,9,8,6,8,10,14
7DATA 27,31,29,31,30,32,30,33,30,30,32,34
8FOR I=1TO 20:J=I
9M(I)=(Y(J)+Y(J+1)+Y(J+2)+Y(J+3)+Y(J+4))/5
10N(I)=M(I)*I:NEXT I
11L, J, A, B, K=0
12FOR T=1TO 20
13A=A+T:B=B+T^2:L=L+N(T)
14K=K+M(T):NEXT T
15B1=(20*L-A*K)/(20*B-A^2)
16A1=(K/20)-((B1*A)/20)
17F=A1+82*B1
18PRINT HEX(0E); "*****":PRINT
19PRINT TAB(12); "FORECAST FOR OPERATION HOURS OF C-123K IN DEC. 2523"
20PRINT
21PRINT TAB(12); "BY MOVING AVERAGE AND LINEAR REGRESSION METHOD"
22PRINT :PRINT
23PRINT TAB(8); " DATA          YI          XI          XI^2          XI. YI"
24PRINT TAB(10); Y(1):PRINT TAB(10); Y(2)
25FOR I=1TO 20:J=I
26PRINT USING 192, Y(J+2), M(I), I, I^2, N(I)
27%      ###          ###. ##          ##          #####          #####. ##
28NEXT I
29PRINT TAB(9); Y(23):PRINT TAB(9); Y(24)
30PRINT TAB(8); "*****"
31PRINT USING 209, K, A, B, L
32%      SUMMATION  ###. ##          #####          #####          #####. ##
33PRINT TAB(8); "*****"
34PRINT
35PRINT TAB(8); "B = (N(S. XI. YI)-(S. XI)(S. YI))/(N(S. XI^2)-(S. XI)^2)"
36PRINT USING 214, L, -A, K, B, -A^2, B1
37%      = (20*#####. ##-#####. ##)/(20*#####-#####) = #. #####
38PRINT TAB(8); "A = (S. YI)/N - B*(S. XI)/N"
39PRINT USING 218, K, B1, A, A1
40%      = (###. ##/20)-((#. #####*#####)/20) = #. #####
41PRINT
42PRINT TAB(12); "FORECAST FOR OPERATION HOURS OF C-123K IN DEC. 2523"
43PRINT
44PRINT TAB(20); "Y = A+X*B":PRINT
45PRINT USING 236, A1, B1
46%      = ##. #####+82*#. #####
47PRINT
48PRINT HEX(0E); TAB(8); "#Y ="; F; "HRS. ":PRINT
49PRINT HEX(0E); "*****"
50END

```

 FORECAST FOR OPERATION HOURS OF C-123K IN DEC. 2523

BY MOVING AVERAGE AND LINEAR REGRESSION METHOD

| DATA | YI | XI | XI ² | XI.YI |
|------|-------|----|-----------------|--------|
| 6 | | | | |
| 9 | | | | |
| 9 | 7.80 | 1 | 1 | 7.80 |
| 6 | 8.00 | 2 | 4 | 16.00 |
| 9 | 8.00 | 3 | 9 | 24.00 |
| 7 | 7.80 | 4 | 16 | 31.20 |
| 9 | 7.80 | 5 | 25 | 39.00 |
| 8 | 7.60 | 6 | 36 | 45.60 |
| 6 | 8.20 | 7 | 49 | 57.40 |
| 8 | 9.20 | 8 | 64 | 73.60 |
| 10 | 13.00 | 9 | 81 | 117.00 |
| 14 | 18.00 | 10 | 100 | 180.00 |
| 27 | 22.20 | 11 | 121 | 244.20 |
| 31 | 26.40 | 12 | 144 | 316.80 |
| 29 | 29.60 | 13 | 169 | 384.80 |
| 31 | 30.60 | 14 | 196 | 428.40 |
| 30 | 30.40 | 15 | 225 | 456.00 |
| 32 | 31.20 | 16 | 256 | 499.20 |
| 30 | 31.00 | 17 | 289 | 527.00 |
| 33 | 31.00 | 18 | 324 | 558.00 |
| 30 | 31.00 | 19 | 361 | 589.00 |
| 30 | 31.80 | 20 | 400 | 636.00 |
| 32 | | | | |
| 34 | | | | |

 SUMMATION 390.60 210 2870 5231.00
 #####

$$B = \frac{N(\sum X_i Y_i) - (\sum X_i)(\sum Y_i)}{N(\sum X_i^2) - (\sum X_i)^2}$$

$$= \frac{(20 \times 5231.00) - (210 \times 390.60)}{(20 \times 2870) - (44100)} = 1.69879$$

$$A = \frac{(\sum Y_i)}{N} - B \left(\frac{\sum X_i}{N} \right)$$

$$= \frac{(390.60/20)}{20} - ((1.69879 \times 210)/20) = 1.69263$$

FORECAST FOR OPERATION HOURS OF C-123K IN DEC. 2523

$$Y = A + X \cdot B$$

$$= 1.69263 + 82 \times 1.69879$$

$$\#Y = 140.9939849623 \text{ HRS.}$$

```

1REM WANG 2200; RTAF. ACADEMY
2REM FORECAST FOR TOTAL PASSENGERS OF AIR CARGO, RTAF. IN DEC. 2523
3REM BY VORAPOT KHOMPIS
40DIM Y(36), M(32), N(32)
50FOR J=1TO 36:READ Y(J):NEXT J
60DATA 6430, 6312, 6570, 6444, 6586, 6695, 6773, 6842, 6846, 6870, 6890, 6903
70DATA 6946, 6979, 6915, 6936, 6938, 6980, 7008, 7154, 7162, 7229, 7259, 7201
80DATA 7293, 7224, 7321, 7405, 7301, 7483, 7364, 7575, 7638, 7642, 7789, 7684
90FOR I=1TO 32:J=I
100M(I)=(Y(J)+Y(J+1)+Y(J+2)+Y(J+3)+Y(J+4))/5
110N(I)=M(I)*I:NEXT I
120L, J, A, B, K=0
130FOR T=1TO 32
140A=A+T:B=B+T^2:L=L+N(T)
150K=K+M(T):NEXT T
160B1=(32*L-A*K)/(32*B-A^2)
170A1=(K/32)-((B1*A)/32)
180F=A1+94*B1
190PRINT HEX(0E); "*****":PRINT
200PRINT TAB(6); "FORECAST FOR TOTAL PASSENGERS OF AIR CARGO IN DEC. 2523"
210PRINT
220PRINT TAB(12); "BY MOVING AVERAGE AND LINEAR REGRESSION METHOD"
230PRINT :PRINT
240PRINT TAB(8); "DATA          YI          XI          XI^2          XI. YI"
250PRINT TAB(7); Y(1):PRINT TAB(7); Y(2)
260FOR I=1TO 32:J=I
270PRINTUSING 192, Y(J+2), M(I), I, I^2, N(I)
280192%          ####          ####.##          ##          ####          #####.##
290NEXT I
300PRINT TAB(7); Y(35):PRINT TAB(7); Y(36)
310PRINT TAB(6); "*****"
320PRINTUSING 209, K, A, B, L
330209%          SUMMATION  #####.##          #####          #####          #####.##
340PRINT TAB(6); "*****"
350PRINT
360PRINT TAB(8); "B = (N(S. XI. YI)-(S. XI)(S. YI))/(N(S. XI^2)-(S. XI)^2)"
370PRINTUSING 214, L, -A, K, B, -A^2, B1
380214%          = (32*#####.##-###*#####.##)/(32*#####-#####) = ##.###
390PRINT TAB(8); "A = (S. YI)/N - B*(S. XI)/N"
400PRINTUSING 218, K, B1, A, A1
410218%          = (#####.##/32)-((##.#####*###)/32) = #####.#####:PRINT
420PRINT TAB(10); "FORECAST FOR TOTAL PASSENGERS OF AIR CARGO IN DEC. 2523"
430PRINT
440PRINT TAB(20); "Y = A+X*B":PRINT
450PRINTUSING 236, A1, B1
460236%          = #####.#####+94*###.#####
470PRINT
480PRINT HEX(0E); TAB(8); "#Y = "; F; "HRS. ":PRINT
490PRINT HEX(0E); "*****"
500END

```

BY MOVING AVERAGE AND LINEAR REGRESSION METHOD

| DATA | YI | XI | XI ² | XI.YI |
|------|---------|----|-----------------|-----------|
| 6430 | | | | |
| 6312 | | | | |
| 6570 | 6468.40 | 1 | 1 | 6468.40 |
| 6444 | 6521.40 | 2 | 4 | 13042.80 |
| 6586 | 6613.60 | 3 | 9 | 19840.80 |
| 6695 | 6668.00 | 4 | 16 | 26672.00 |
| 6773 | 6748.40 | 5 | 25 | 33742.00 |
| 6842 | 6805.20 | 6 | 36 | 40831.20 |
| 6846 | 6844.20 | 7 | 49 | 47909.40 |
| 6870 | 6870.20 | 8 | 64 | 54961.60 |
| 6890 | 6891.00 | 9 | 81 | 62019.00 |
| 6903 | 6917.60 | 10 | 100 | 69176.00 |
| 6946 | 6926.60 | 11 | 121 | 76192.60 |
| 6979 | 6935.80 | 12 | 144 | 83229.60 |
| 6915 | 6942.80 | 13 | 169 | 90256.40 |
| 6936 | 6949.60 | 14 | 196 | 97294.40 |
| 6938 | 6955.40 | 15 | 225 | 104331.00 |
| 6980 | 7003.20 | 16 | 256 | 112051.20 |
| 7008 | 7048.40 | 17 | 289 | 119822.80 |
| 7154 | 7106.60 | 18 | 324 | 127918.80 |
| 7162 | 7162.40 | 19 | 361 | 136085.60 |
| 7229 | 7201.00 | 20 | 400 | 144020.00 |
| 7259 | 7228.80 | 21 | 441 | 151804.80 |
| 7201 | 7241.20 | 22 | 484 | 159306.40 |
| 7293 | 7259.60 | 23 | 529 | 166970.80 |
| 7224 | 7288.80 | 24 | 576 | 174931.20 |
| 7321 | 7308.80 | 25 | 625 | 182720.00 |
| 7405 | 7346.80 | 26 | 676 | 191016.80 |
| 7301 | 7374.80 | 27 | 729 | 199119.60 |
| 7483 | 7425.60 | 28 | 784 | 207916.80 |
| 7364 | 7472.20 | 29 | 841 | 216693.80 |
| 7575 | 7540.40 | 30 | 900 | 226212.00 |
| 7638 | 7601.60 | 31 | 961 | 235649.60 |
| 7642 | 7665.60 | 32 | 1024 | 245299.20 |
| 7789 | | | | |
| 7684 | | | | |

 SUMMATION 226334.00 528 11440 3823506.60
 #####

$$B = \frac{N(S.XI.YI) - (S.XI)(S.YI)}{N(S.XI^2) - (S.XI)^2}$$

$$= \frac{(32 * 3823506.60) - (528 * 226334.00)}{(32 * 11440) - (278784)} = 32.62302$$

$$A = \frac{(S.YI)}{N} - B * \frac{(S.XI)}{N}$$

$$= \frac{(226334.00 / 32) - ((32.62302 * 528) / 32)} = 6534.65766$$

FORECAST FOR TOTAL PASSENGERS OF AIR CARGO IN DEC. 2523

$$Y = A + X * B$$

$$= 6534.65766 + 94 * 32.62302$$

#Y = 9601.22159091 HRS.

```

1REM WANG 2200;RTAF. ACADEMY
2REM FORECAST FOR TOTAL WEIGHT(LBS) OF AIR CARGO,RTAF. IN DEC. 2523
3REM BY VORAPOT KHOMPIS
4DIM Y(36),M(32),N(32)
5FOR J=1TO 36:READ Y(J):NEXT J
6DATA 623285,631222,636402,635353,642972,634125,626339,654841,663970
7DATA 649534,674714,656952,640389,669833,710561,659703,666847,640002
8DATA 665562,687384,679517,705854,700270,698843,743297,674749,689633
9DATA 742684,752703,751260,739736,737183,748248,753864,764319,766109
10FOR I=1TO 32:J=I
11M(I)=(Y(J)+Y(J+1)+Y(J+2)+Y(J+3)+Y(J+4))/5
12N(I)=M(I)*I:NEXT I
13L, J, A, B, K=0
14FOR T=1TO 32
15A=A+T:B=B+T^2:L=L+N(T)
16K=K+M(T):NEXT T
17B1=(32*L-A*K)/(32*B-A^2)
18A1=(K/32)-((B1*A)/32)
19F=A1+94*B1
20PRINT HEX(0E); "*****":PRINT
21PRINT TAB(6); "FORECAST FOR TOTAL WEIGHT(LBS) OF AIR CARGO IN DEC. 2523"
22PRINT
23PRINT TAB(12); "BY MOVING AVERAGE AND LINEAR REGRESSION METHOD"
24PRINT :PRINT
25PRINT TAB(8); "DATA          YI          XI          XI^2          XI.YI"
26PRINT TAB(6);Y(1):PRINT TAB(6);Y(2)
27FOR I=1TO 32:J=I
28PRINTUSING 192,Y(J+2),M(I),I,I^2,N(I)
192%          #####          #####.##          ##          #####          #####.##
29NEXT I
30PRINT TAB(6);Y(35):PRINT TAB(6);Y(36)
31PRINT TAB(6); "#####"
32PRINTUSING 209,K,A,B,L
209%          SUMMATION #####.##          #####          #####          #####.##
33PRINT TAB(6); "#####"
34PRINT
35PRINT TAB(8); "B = (N(S. XI. YI)-(S. XI)(S. YI))/(N(S. XI^2)-(S. XI)^2)"
36PRINTUSING 214,L,-A,K,B,-A^2
214%          = (32+#####.##-#####.##)/(32+#####-#####)
37PRINTUSING 219,B1
38PRINT TAB(8); "A = (S. YI)/N - B*(S. XI)/N"
39PRINTUSING 218,K,B1,A,A1
218%          = (#####.##/32)-((#####.#####)/32) = #####.#####
219%          = #####.#####:PRINT
40PRINT TAB(10); "FORECAST FOR TOTAL WEIGHT(LBS) OF AIR CARGO IN DEC. 2523"
41PRINT
42PRINT TAB(20); "Y = A+X*B":PRINT
43PRINTUSING 236,A1,B1
236%          = #####.#####+94*#####.#####:PRINT
44PRINT HEX(0E); TAB(8); "#Y ="; F; "HRS. ":PRINT
45PRINT HEX(0E); "*****"
46END

```


FORECAST FOR TOTAL WEIGHT(LBS) OF AIR CARGO IN DEC. 2523

BY MOVING AVERAGE AND LINEAR REGRESSION METHOD

| DATA | YI | XI | XI ² | XI.YI |
|--------|-----------|----|-----------------|-------------|
| 623285 | | | | |
| 631222 | | | | |
| 636402 | 633846.80 | 1 | 1 | 633846.80 |
| 635353 | 636014.80 | 2 | 4 | 1272029.60 |
| 642972 | 635038.20 | 3 | 9 | 1905114.60 |
| 634125 | 638726.00 | 4 | 16 | 2554904.00 |
| 626339 | 644449.40 | 5 | 25 | 3222247.00 |
| 654841 | 645761.80 | 6 | 36 | 3874570.80 |
| 663970 | 653879.60 | 7 | 49 | 4577157.20 |
| 649534 | 660002.20 | 8 | 64 | 5280017.60 |
| 674714 | 657111.80 | 9 | 81 | 5914006.20 |
| 656952 | 658284.40 | 10 | 100 | 6582844.00 |
| 640389 | 670489.80 | 11 | 121 | 7375387.80 |
| 669833 | 667487.60 | 12 | 144 | 8009851.20 |
| 710561 | 669466.60 | 13 | 169 | 8703065.80 |
| 659703 | 669389.20 | 14 | 196 | 9371448.80 |
| 666847 | 668535.00 | 15 | 225 | 10028025.00 |
| 640002 | 663899.60 | 16 | 256 | 10622393.60 |
| 665562 | 667862.40 | 17 | 289 | 11353660.80 |
| 687384 | 675663.80 | 18 | 324 | 12161948.40 |
| 679517 | 687717.40 | 19 | 361 | 13066630.60 |
| 705854 | 694373.60 | 20 | 400 | 13887472.00 |
| 700270 | 705556.20 | 21 | 441 | 14816680.20 |
| 698843 | 704602.60 | 22 | 484 | 15501257.20 |
| 743297 | 701358.40 | 23 | 529 | 16131243.20 |
| 674749 | 709841.20 | 24 | 576 | 17036188.80 |
| 689633 | 720613.20 | 25 | 625 | 18015330.00 |
| 742684 | 722205.80 | 26 | 676 | 18777350.80 |
| 752703 | 735203.20 | 27 | 729 | 19850486.40 |
| 751260 | 744713.20 | 28 | 784 | 20851969.60 |
| 739736 | 745826.00 | 29 | 841 | 21628954.00 |
| 737183 | 746058.20 | 30 | 900 | 22381746.00 |
| 748248 | 748670.00 | 31 | 961 | 23208770.00 |
| 753864 | 753944.60 | 32 | 1024 | 24126227.20 |
| 764319 | | | | |
| 766109 | | | | |

 SUMMATION 21936592.60 528 11440 372722825.20
 #####

$$B = \frac{(N \cdot \sum XI \cdot YI) - (\sum XI)(\sum YI)}{(N \cdot \sum XI^2) - (\sum XI)^2}$$

$$= \frac{(32 \cdot 372722825.20 - 528 \cdot 21936592.60)}{(32 \cdot 11440 - 278784)}$$

$$= 3947.59798$$

$$A = \frac{(\sum YI)}{N} - B \cdot \frac{(\sum XI)}{N}$$

$$= \frac{(21936592.60)}{32} - ((3947.59798 + 528) / 32) = 620383.15201$$

FORECAST FOR TOTAL WEIGHT(LBS) OF AIR CARGO IN DEC. 2523

$$Y = A + X \cdot B$$

$$= 620383.15201 + 94 \cdot 3947.59798$$

#Y = 991457.3625001 HRS.


```

1 REM WANG 2200 ; RTAF. ACADEMY
2 REM OPTIMAL SOLUTION OF TRANSPORT A/C IN DEC. 2523
3 REM DATA CASSETE ; PS02-2200. 01A-00FI-19-0; LINEAR PROGRAMMING
4 DIM A(10,14), X(13), G(10): PRINT HEX(0E); "*****"
5 PRINT : PRINT : PRINT HEX(0E); TAB(5); "OPTIMAL SOLUTION OF TRANSPORT"
6 PRINT : PRINT HEX(0E); TAB(5); "AIRCRAFT IN DEC. 2523": PRINT : PRINT
8 M=3 : PRINT HEX(0E); TAB(5); "TYPES OF TRANSPORT A/C ="; M: PRINT
10 N=4: PRINT HEX(0E); TAB(5); "NUMBER OF CONSTRAINTS  ="; N: PRINT
15 PRINT HEX(0E); TAB(5); "ENTER MATRIX A": PRINT
20 FOR I=2TO 5: READ A(I, 1), A(I, 2), A(I, 3), A(I, 4), A(I, 5)
21 DATA 1, 0, 0, -1, 15. 6444
22 DATA 0, 1, 0, -1, 14. 3778
23 DATA 0, 0, 1, -1, 5. 4667
24 DATA 1, 2. 4282, 2. 3449, -1, 92. 1093
25 PRINT USING 27, A(I, 1), A(I, 2), A(I, 3), A(I, 4), A(I, 5)
27%      #. #### #. #### #. #### #. #### ##. ####
30 A(I, N+M+1)=A(I, M+2): A(I, M+2)=0: IF I=2 THEN 40
35 A(I, M+I-1)=A(I, M+1): A(I, M+1)=0
40 NEXT I: PRINT : PRINT HEX(0E); TAB(5); "ENTER OBJECTIVE FUNCTION": PRINT
50 READ A(1, 1), A(1, 2), A(1, 3): DATA 175500, 558000, 621000
55 PRINT TAB(10); A(1, 1), A(1, 2), A(1, 3): PRINT
60 PRINT : R=1: FOR I=1 TO M: X(I)=1: NEXT I
70 FOR I=2TO N+1: IF A(I, M+I-1) < -1 THEN 85: X(M+I-1)=1
75 FOR J=1 TO N+M: A(N+2, J)=A(N+2, J)-A(I, J): NEXT J: R=N+2
85 NEXT I
90 S, T=1
95 FOR I=2 TO N+M: IF A(R, I) < A(R, S) THEN 100: S=I
100 IF A(R, I) >= A(R, T) THEN 110: T=I
110 NEXT I: IF A(R, T) < 0 THEN 140: IF R=1 THEN 300
130 IF A(R, S) > 1E-4 THEN 280: R=1: GOTO 90
140 S=1
150 FOR I=2 TO N+1: IF A(I, T) <= 0 THEN 190
170 Y=A(I, N+M+1)/A(I, T): IF S=1 THEN 180: IF Y >= A(S, N+M+1)/A(S, T) THEN 190
180 S=I
190 NEXT I
200 IF S=1 THEN 290
210 FOR I=1 TO N+M: IF X(I)=1 THEN 220: IF A(S, I)=1 THEN 230
220 NEXT I
230 SELECT LIST 215(132)
240 FOR I=1 TO N+M+1: A(S, I)=A(S, I)/Y: NEXT I
250 FOR I=1 TO N+2: IF I=S THEN 270: Y=A(I, T)
260 FOR J=1 TO N+M+1: A(I, J)=A(I, J)-Y*A(S, J): NEXT J
270 NEXT I: GOTO 90
280 PRINT "INFEASIBLE": STOP
290 PRINT "UNBOUNDED": STOP
300 FOR J=1 TO M
310 IF X(J)=0 THEN 320: X(J)=0: GOTO 340
320 FOR I=2TO N+1: IF A(I, J)=1 THEN 330: NEXT I
330 X(J)=A(I, N+M+1): G(J)=INT(X(J))+1
340 NEXT J: Y=A(1, N+M+1): H=G(1)*175500+G(2)*558000+G(3)*621000
370 PRINT HEX(0E); TAB(5); "#C-47  ="; X(1): PRINT HEX(0E); TAB(10); "OR ="; G(
371 PRINT HEX(0E); TAB(5); "#C-123B ="; X(2): PRINT HEX(0E); TAB(10); "OR ="; G(
372 PRINT HEX(0E); TAB(5); "#C-123K ="; X(3): PRINT HEX(0E); TAB(10); "OR ="; G(
375 PRINT HEX(0E); TAB(2); "MINIMUM COST(BAHTS) ="; -Y
376 PRINT HEX(0E); TAB(19); "OR ="; H: PRINT : PRINT
378 PRINT HEX(0E); "*****"
380 END

```

 OPTIMAL SOLUTION OF TRANSPORT
 AIRCRAFT IN DEC. 2523

TYPES OF TRANSPORT A/C = 3

NUMBER OF CONSTRAINTS = 4

ENTER MATRIX A

| | | | | |
|--------|--------|--------|---------|---------|
| 1.0000 | 0.0000 | 0.0000 | -1.0000 | 15.6444 |
| 0.0000 | 1.0000 | 0.0000 | -1.0000 | 14.3778 |
| 0.0000 | 0.0000 | 1.0000 | -1.0000 | 5.4667 |
| 1.0000 | 2.4282 | 2.3449 | -1.0000 | 92.1093 |

ENTER OBJECTIVE FUNCTION

| | | |
|--------|--------|--------|
| 175500 | 558000 | 621000 |
|--------|--------|--------|

#C-47 = 44.37826120998
 OR = 45

#C-123B = 14.3778
 OR = 15

#C-123K = 5.4667
 OR = 6

MINIMUM COST(BAHTS) = 19206017.94235
 OR = 19993500

ผนวก ข.

โปรแกรม และ ผลลัพธ์ ของการคาดคะเนส่วนแบ่งชั่วโมงบิน สำหรับอนาคต


```

1 REM WANG 2200 ; RTAF. ACADEMY
2 REM PREDICTION OF HOUR SHARES FOR FUTURE PERIOD
3 REM WITH FIRST ORDER MARKOV ANALYSIS; METHOD 1
4 REM BY VORAPOT KHOMPIS
10DIM A(3, 3), B(3, 1)
20MAT READ A
30 MAT READ B
40 DATA . 7073, . 2553, . 3966
50 DATA . 2331, . 6679, . 3512
60 DATA . 0596, . 0768, . 2522
70 DATA . 5256
80 DATA . 3995
90 DATA . 0749
91 PRINT HEX(0E); "*****"
92 PRINT :PRINT HEX(0E); TAB(5); "PREDICTION OF HOUR SHARES":PRINT
94 PRINT HEX(0E); TAB(5); "FOR FUTURE PERIOD (BE. 2519-2533)":PRINT
96 PRINT HEX(0E); TAB(5); "BY FIRST ORDER MARKOV ANALYSIS":PRINT
97PRINT HEX(0E); TAB(5); "(METHOD 1)":PRINT
98 PRINT TAB(10); "(TRANSITION PROB. MATRIX)*(PERIOD N, PROB. HR. SHARES)"
100PRINT TAB(25); "= (PERIOD N+1, PROB. HR. SHARES)":PRINT :PRINT
105 PRINT :PRINT
110 FOR M=1TO 15
120 MAT C=A*B
132PRINT "*****"
133PRINT
136PRINTUSING 138, M+2517
138% ((TRANSITION PROBABILITY MATRIX)^##) * (PROB. HR. SHARES IN BE. 2518)
140PRINTUSING 170, A(1, 1), A(1, 2), A(1, 3), B(1, 1)
150PRINTUSING 180, A(2, 1), A(2, 2), A(2, 3), B(2, 1)
160PRINTUSING 190, A(3, 1), A(3, 2), A(3, 3), B(3, 1)
170% C-47 #. ##### #. ##### #. ##### C-47 #. #####
180% C-123B #. ##### #. ##### #. ##### C-123B #. #####
190% C-123K #. ##### #. ##### #. ##### C-123K #. #####
200 PRINT
210 PRINT TAB(16); "= PROBABLE HR. SHARES IN BE. "; M+2518
220 PRINTUSING 250, C(1, 1)
230 PRINTUSING 260, C(2, 1)
240 PRINTUSING 270, C(3, 1)
250% C-47 #. #####
260% C-123B #. #####
270% C-123K #. #####
280 PRINT
290 MAT B=C
300 NEXT M:PRINT
310 PRINT HEX(0E); "*****"
320 END

```



 PREDICTION OF HOUR SHARES
 FOR FUTURE PERIOD (BE. 2519-2533)
 BY FIRST ORDER MARKOV ANALYSIS
 (METHOD 1)

(TRANSITION PROB. MATRIX)*(PERIOD N, PROB. HR. SHARES)
 = (PERIOD N+1, PROB. HR. SHARES)

 (TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2518)
 C-47 0. 70730 0. 25530 0. 39660 C-47 0. 52560
 C-123B 0. 23310 0. 66790 0. 35120 C-123B 0. 39950
 C-123K 0. 05960 0. 07680 0. 25220 C-123K 0. 07490

= PROBABLE HR. SHARES IN BE. 2519

C-47 0. 50345
 C-123B 0. 41564
 C-123K 0. 08090

 (TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2519)
 C-47 0. 70730 0. 25530 0. 39660 C-47 0. 50345
 C-123B 0. 23310 0. 66790 0. 35120 C-123B 0. 41564
 C-123K 0. 05961 0. 07681 0. 25221 C-123K 0. 08089

= PROBABLE HR. SHARES IN BE. 2520

C-47 0. 49429
 C-123B 0. 42337
 C-123K 0. 08233

 (TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2520)
 C-47 0. 70730 0. 25530 0. 39660 C-47 0. 49429
 C-123B 0. 23310 0. 66790 0. 35120 C-123B 0. 42337
 C-123K 0. 05961 0. 07681 0. 25221 C-123K 0. 08232

= PROBABLE HR. SHARES IN BE. 2521

C-47 0. 49035
 C-123B 0. 42690
 C-123K 0. 08274

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2521)

| | | | | | |
|--------|----------|----------|----------|--------|----------|
| C-47 | 0. 70730 | 0. 25530 | 0. 39660 | C-47 | 0. 49035 |
| C-123B | 0. 23310 | 0. 66790 | 0. 35120 | C-123B | 0. 42690 |
| C-123K | 0. 05961 | 0. 07681 | 0. 25221 | C-123K | 0. 08273 |

= PROBABLE HR. SHARES IN BE. 2522

| | |
|--------|----------|
| C-47 | 0. 48863 |
| C-123B | 0. 42849 |
| C-123K | 0. 08288 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2522)

| | | | | | |
|--------|----------|----------|----------|--------|----------|
| C-47 | 0. 70730 | 0. 25530 | 0. 39660 | C-47 | 0. 48863 |
| C-123B | 0. 23310 | 0. 66790 | 0. 35120 | C-123B | 0. 42849 |
| C-123K | 0. 05961 | 0. 07681 | 0. 25221 | C-123K | 0. 08287 |

= PROBABLE HR. SHARES IN BE. 2523

| | |
|--------|----------|
| C-47 | 0. 48787 |
| C-123B | 0. 42919 |
| C-123K | 0. 08294 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2523)

| | | | | | |
|--------|----------|----------|----------|--------|----------|
| C-47 | 0. 70730 | 0. 25530 | 0. 39660 | C-47 | 0. 48787 |
| C-123B | 0. 23310 | 0. 66790 | 0. 35120 | C-123B | 0. 42919 |
| C-123K | 0. 05961 | 0. 07681 | 0. 25221 | C-123K | 0. 08293 |

= PROBABLE HR. SHARES IN BE. 2524

| | |
|--------|----------|
| C-47 | 0. 48753 |
| C-123B | 0. 42950 |
| C-123K | 0. 08296 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2524)

| | | | | | |
|--------|----------|----------|----------|--------|----------|
| C-47 | 0. 70730 | 0. 25530 | 0. 39660 | C-47 | 0. 48753 |
| C-123B | 0. 23310 | 0. 66790 | 0. 35120 | C-123B | 0. 42950 |
| C-123K | 0. 05961 | 0. 07681 | 0. 25221 | C-123K | 0. 08295 |

= PROBABLE HR. SHARES IN BE. 2525

| | |
|--------|----------|
| C-47 | 0. 48738 |
| C-123B | 0. 42964 |
| C-123K | 0. 08297 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2525)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.48738 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.42964 |
| C-123K | 0.05961 | 0.07681 | 0.25221 | C-123K | 0.08296 |

= PROBABLE HR. SHARES IN BE. 2526

| | |
|--------|---------|
| C-47 | 0.48732 |
| C-123B | 0.42970 |
| C-123K | 0.08297 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2526)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.48732 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.42970 |
| C-123K | 0.05961 | 0.07681 | 0.25221 | C-123K | 0.08296 |

= PROBABLE HR. SHARES IN BE. 2527

| | |
|--------|---------|
| C-47 | 0.48729 |
| C-123B | 0.42973 |
| C-123K | 0.08298 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2527)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.48729 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.42973 |
| C-123K | 0.05961 | 0.07681 | 0.25221 | C-123K | 0.08297 |

= PROBABLE HR. SHARES IN BE. 2528

| | |
|--------|---------|
| C-47 | 0.48728 |
| C-123B | 0.42974 |
| C-123K | 0.08298 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2528)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.48728 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.42974 |
| C-123K | 0.05961 | 0.07681 | 0.25221 | C-123K | 0.08297 |

= PROBABLE HR. SHARES IN BE. 2529

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2529)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.48727 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.42975 |
| C-123K | 0.05961 | 0.07681 | 0.25221 | C-123K | 0.08297 |

= PROBABLE HR. SHARES IN BE. 2530

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2530)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.48727 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.42975 |
| C-123K | 0.05961 | 0.07681 | 0.25221 | C-123K | 0.08297 |

= PROBABLE HR. SHARES IN BE. 2531

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2531)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.48727 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.42975 |
| C-123K | 0.05961 | 0.07681 | 0.25221 | C-123K | 0.08297 |

= PROBABLE HR. SHARES IN BE. 2532

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

(TRANSITION PROBABILITY MATRIX) * (PROB. HR. SHARES IN BE. , 2532)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.48727 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.42975 |
| C-123K | 0.05961 | 0.07681 | 0.25221 | C-123K | 0.08297 |

= PROBABLE HR. SHARES IN BE. 2533

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

```

1 REM WANG 2200 ; RTAF.ACADEMY
2 REM PREDICTION OF HOUR SHARES FOR FUTURE PERIOD
3 REM WITH FIRST ORDER MARKOV ANALYSIS;METHOD 2
4 REM BY VORAPOT KHOMPIS
10DIM A(3,3),B(3,1)
20MAT READ A
30 MAT READ B
40 DATA .7073,.2553,.3966
50 DATA .2331,.6679,.3512
60 DATA .0596,.0768,.2522
70 DATA .5256
80 DATA .3995
90 DATA .0749
91PRINT HEX(0E); "*****"
92 PRINT :PRINT :PRINT HEX(0E);TAB(5); "PREDICTION OF HOUR SHARES":PRINT
94 PRINT HEX(0E);TAB(5); "FOR FUTURE PERIOD (BE. 2519-2533)":PRINT
96 PRINT HEX(0E);TAB(5); "BY FIRST ORDER MARKOV ANALYSIS":PRINT
97PRINT HEX(0E);TAB(5); "(METHOD 2)":PRINT
98 PRINT TAB(10); "((TRANSITION PROB. MATRIX)^N)*(PERIOD 1, PROB. HR. SHARES)"
100PRINT TAB(25); "= (PERIOD N+1, PROB. HR. SHARES)":PRINT :PRINT
105 MAT D=A
110 FOR M=1TO 15
120 MAT C=D*B
125 MAT E=D*A
132PRINT " *****"
133PRINT
136PRINTUSING 138,M
138% ((TRANSITION PROBABILITY MATRIX)^##) * (PROB. HR. SHARES IN BE. 2518)
140PRINTUSING 170,D(1,1),D(1,2),D(1,3),B(1,1)
150PRINTUSING 180,D(2,1),D(2,2),D(2,3),B(2,1)
160PRINTUSING 190,D(3,1),D(3,2),D(3,3),B(3,1)
170%      C-47  #. #####  #. #####  #. #####      C-47  #. #####
180%      C-123B #. #####  #. #####  #. #####      C-123B #. #####
190%      C-123K #. #####  #. #####  #. #####      C-123K #. #####
200 PRINT
210 PRINT TAB(18); "= PROBABLE HR. SHARES IN BE. ";M+2518
220 PRINTUSING 250,C(1,1)
230 PRINTUSING 260,C(2,1)
240 PRINTUSING 270,C(3,1)
250%      C-47  #. #####
260%      C-123B #. #####
270%      C-123K #. #####
280 PRINT
290 MAT D=E
300 NEXT M:PRINT
310PRINT HEX(0E); "*****"
320 END

```

PREDICTION OF HOUR SHARES
FOR FUTURE PERIOD (BE. 2519-2533)
BY FIRST ORDER MARKOV ANALYSIS
(METHOD 2)

((TRANSITION PROB. MATRIX)^N)*(PERIOD 1, PROB. HR. SHARES)
= (PERIOD N+1, PROB. HR. SHARES)

((TRANSITION PROBABILITY MATRIX)^1) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.70730 | 0.25530 | 0.39660 | C-47 | 0.52560 |
| C-123B | 0.23310 | 0.66790 | 0.35120 | C-123B | 0.39950 |
| C-123K | 0.05960 | 0.07680 | 0.25220 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2519

| | |
|--------|---------|
| C-47 | 0.50345 |
| C-123B | 0.41564 |
| C-123K | 0.08090 |

((TRANSITION PROBABILITY MATRIX)^2) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.58342 | 0.38154 | 0.47019 | C-47 | 0.52560 |
| C-123B | 0.34149 | 0.53257 | 0.41558 | C-123B | 0.39950 |
| C-123K | 0.07509 | 0.08588 | 0.11422 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2520

| | |
|--------|---------|
| C-47 | 0.49429 |
| C-123B | 0.42337 |
| C-123K | 0.08233 |

((TRANSITION PROBABILITY MATRIX)^3) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.52961 | 0.43989 | 0.48396 | C-47 | 0.52560 |
| C-123B | 0.39044 | 0.47480 | 0.42728 | C-123B | 0.39950 |
| C-123K | 0.07994 | 0.08531 | 0.08875 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2521

| | |
|--------|---------|
| C-47 | 0.49035 |
| C-123B | 0.42690 |
| C-123K | 0.08274 |

((TRANSITION PROBABILITY MATRIX)^ 4) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.50598 | 0.46618 | 0.48659 | C-47 | 0.52560 |
| C-123B | 0.41230 | 0.44961 | 0.42936 | C-123B | 0.39950 |
| C-123K | 0.08172 | 0.08420 | 0.08405 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2522

| | |
|--------|---------|
| C-47 | 0.48863 |
| C-123B | 0.42849 |
| C-123K | 0.08288 |

((TRANSITION PROBABILITY MATRIX)^ 5) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.49554 | 0.47791 | 0.48711 | C-47 | 0.52560 |
| C-123B | 0.42202 | 0.43853 | 0.42971 | C-123B | 0.39950 |
| C-123K | 0.08243 | 0.08355 | 0.08318 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2523

| | |
|--------|---------|
| C-47 | 0.48787 |
| C-123B | 0.42919 |
| C-123K | 0.08294 |

((TRANSITION PROBABILITY MATRIX)^ 6) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.49093 | 0.48312 | 0.48722 | C-47 | 0.52560 |
| C-123B | 0.42632 | 0.43364 | 0.42976 | C-123B | 0.39950 |
| C-123K | 0.08274 | 0.08324 | 0.08301 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2524

| | |
|--------|---------|
| C-47 | 0.48753 |
| C-123B | 0.42950 |
| C-123K | 0.08296 |

((TRANSITION PROBABILITY MATRIX)^ 7) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48889 | 0.48543 | 0.48725 | C-47 | 0.52560 |
| C-123B | 0.42823 | 0.43147 | 0.42976 | C-123B | 0.39950 |
| C-123K | 0.08287 | 0.08309 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2525

| | |
|--------|---------|
| C-47 | 0.48738 |
| C-123B | 0.42964 |
| C-123K | 0.08297 |

((TRANSITION PROBABILITY MATRIX)^ 8) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48798 | 0.48645 | 0.48726 | C-47 | 0.52560 |
| C-123B | 0.42908 | 0.43051 | 0.42976 | C-123B | 0.39950 |
| C-123K | 0.08293 | 0.08303 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2526

| | |
|--------|---------|
| C-47 | 0.48732 |
| C-123B | 0.42970 |
| C-123K | 0.08297 |

((TRANSITION PROBABILITY MATRIX)^ 9) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48758 | 0.48690 | 0.48726 | C-47 | 0.52560 |
| C-123B | 0.42945 | 0.43009 | 0.42975 | C-123B | 0.39950 |
| C-123K | 0.08296 | 0.08300 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2527

| | |
|--------|---------|
| C-47 | 0.48729 |
| C-123B | 0.42973 |
| C-123K | 0.08298 |

((TRANSITION PROBABILITY MATRIX)^10) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48741 | 0.48711 | 0.48726 | C-47 | 0.52560 |
| C-123B | 0.42962 | 0.42990 | 0.42975 | C-123B | 0.39950 |
| C-123K | 0.08297 | 0.08299 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2528

| | |
|--------|---------|
| C-47 | 0.48728 |
| C-123B | 0.42974 |
| C-123K | 0.08298 |

((TRANSITION PROBABILITY MATRIX)^11) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48733 | 0.48719 | 0.48726 | C-47 | 0.52560 |
| C-123B | 0.42969 | 0.42982 | 0.42975 | C-123B | 0.39950 |
| C-123K | 0.08297 | 0.08298 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2529

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

((TRANSITION PROBABILITY MATRIX)¹²) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48729 | 0.48723 | 0.48726 | C-47 | 0.52560 |
| C-123B | 0.42973 | 0.42978 | 0.42975 | C-123B | 0.39950 |
| C-123K | 0.08298 | 0.08298 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2530

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

((TRANSITION PROBABILITY MATRIX)¹³) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48728 | 0.48725 | 0.48726 | C-47 | 0.52560 |
| C-123B | 0.42974 | 0.42977 | 0.42975 | C-123B | 0.39950 |
| C-123K | 0.08298 | 0.08298 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2531

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

((TRANSITION PROBABILITY MATRIX)¹⁴) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48727 | 0.48726 | 0.48727 | C-47 | 0.52560 |
| C-123B | 0.42975 | 0.42976 | 0.42975 | C-123B | 0.39950 |
| C-123K | 0.08298 | 0.08298 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2532

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

((TRANSITION PROBABILITY MATRIX)¹⁵) * (PROB. HR. SHARES IN BE. 2518)

| | | | | | |
|--------|---------|---------|---------|--------|---------|
| C-47 | 0.48727 | 0.48726 | 0.48727 | C-47 | 0.52560 |
| C-123B | 0.42975 | 0.42976 | 0.42975 | C-123B | 0.39950 |
| C-123K | 0.08298 | 0.08298 | 0.08298 | C-123K | 0.07490 |

= PROBABLE HR. SHARES IN BE. 2533

| | |
|--------|---------|
| C-47 | 0.48727 |
| C-123B | 0.42975 |
| C-123K | 0.08298 |

```

1REM WANG 2200 ; RTAF. ACADEMY
2REM STEADY STATE OF TRANSITION PROBABILITY MATRIX
3REM BY VORAPOT KHOMPIS
4DIM A(3,3)
5MAT READ A
6DATA .7073, .2331, .0596
7DATA .2553, .6679, .0768
8DATA .3966, .3512, .2522
9PRINT HEX(0E); "*****"
10MAT C=A:PRINT :PRINT
11PRINT HEX(0E); TAB(3); "N-STEPS TRANSITION PROB. MATRIX":PRINT
12FOR M=1TO 15
13MAT B=C*A
14PRINT TAB(16); "*****"
15PRINT
16PRINT TAB(19); "TRANSITION PROBABILITY MATRIX AT STEPS"
17PRINT TAB(31); "C-47      C-123B      C-123K"
18PRINT USING 110, C(1,1), C(1,2), C(1,3)
19PRINT USING 112, C(2,1), C(2,2), C(2,3)
20PRINT USING 114, C(3,1), C(3,2), C(3,3)
2110 %           C-47  #. #####  #. #####  #. #####
22112 %           C-123B #. #####  #. #####  #. #####
23114 %           C-123K #. #####  #. #####  #. #####
2415PRINT
2516MAT C=B
2617NEXT M
2718PRINT :PRINT
29PRINT HEX(0E); "*****"
30END

```

 N-STEPS TRANSITION PROB. MATRIX

TRANSITION PROBABILITY MATRIX AT STEPS 1

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.70730 | 0.23310 | 0.05960 |
| C-123B | 0.25530 | 0.66790 | 0.07680 |
| C-123K | 0.39660 | 0.35120 | 0.25220 |

TRANSITION PROBABILITY MATRIX AT STEPS 2

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.58342 | 0.34149 | 0.07509 |
| C-123B | 0.38154 | 0.53257 | 0.08588 |
| C-123K | 0.47019 | 0.41558 | 0.11422 |

TRANSITION PROBABILITY MATRIX AT STEPS 3

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.52961 | 0.39044 | 0.07994 |
| C-123B | 0.43989 | 0.47480 | 0.08531 |
| C-123K | 0.48396 | 0.42728 | 0.08875 |

TRANSITION PROBABILITY MATRIX AT STEPS 4

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.50598 | 0.41230 | 0.08172 |
| C-123B | 0.46618 | 0.44961 | 0.08420 |
| C-123K | 0.48659 | 0.42936 | 0.08405 |

TRANSITION PROBABILITY MATRIX AT STEPS 5

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.49554 | 0.42202 | 0.08243 |
| C-123B | 0.47791 | 0.43853 | 0.08355 |
| C-123K | 0.48711 | 0.42971 | 0.08318 |

TRANSITION PROBABILITY MATRIX AT STEPS 6

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.49093 | 0.42632 | 0.08274 |
| C-123B | 0.48312 | 0.43364 | 0.08324 |
| C-123K | 0.48722 | 0.42976 | 0.08301 |

TRANSITION PROBABILITY MATRIX AT STEPS 7

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48889 | 0.42823 | 0.08287 |
| C-123B | 0.48543 | 0.43147 | 0.08309 |
| C-123K | 0.48725 | 0.42976 | 0.08298 |

TRANSITION PROBABILITY MATRIX AT STEPS 8

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48798 | 0.42908 | 0.08293 |
| C-123B | 0.48645 | 0.43051 | 0.08303 |
| C-123K | 0.48726 | 0.42976 | 0.08298 |

TRANSITION PROBABILITY MATRIX AT STEPS 9

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48758 | 0.42945 | 0.08296 |
| C-123B | 0.48690 | 0.43009 | 0.08300 |
| C-123K | 0.48726 | 0.42975 | 0.08298 |

TRANSITION PROBABILITY MATRIX AT STEPS 10

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48741 | 0.42962 | 0.08297 |
| C-123B | 0.48711 | 0.42990 | 0.08299 |
| C-123K | 0.48726 | 0.42975 | 0.08298 |

TRANSITION PROBABILITY MATRIX AT STEPS 11

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48733 | 0.42969 | 0.08297 |
| C-123B | 0.48719 | 0.42982 | 0.08298 |
| C-123K | 0.48726 | 0.42975 | 0.08298 |

TRANSITION PROBABILITY MATRIX AT STEPS 12

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48729 | 0.42973 | 0.08298 |
| C-123B | 0.48723 | 0.42978 | 0.08298 |
| C-123K | 0.48726 | 0.42975 | 0.08298 |

TRANSITION PROBABILITY MATRIX AT STEPS 13

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48728 | 0.42974 | 0.08298 |
| C-123B | 0.48725 | 0.42977 | 0.08298 |
| C-123K | 0.48726 | 0.42975 | 0.08298 |

TRANSITION PROBABILITY MATRIX AT STEPS 14

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48727 | 0.42975 | 0.08298 |
| C-123B | 0.48726 | 0.42976 | 0.08298 |
| C-123K | 0.48727 | 0.42975 | 0.08298 |

TRANSITION PROBABILITY MATRIX AT STEPS 15

| | C-47 | C-123B | C-123K |
|--------|---------|---------|---------|
| C-47 | 0.48727 | 0.42975 | 0.08298 |
| C-123B | 0.48726 | 0.42976 | 0.08298 |
| C-123K | 0.48727 | 0.42975 | 0.08298 |

ผนวก ค.

โปรแกรม และ ผลลัพธ์ ของ การหาจำนวนเครื่องบินของหน่วยบินลำเลียงที่
เหมาะสมที่สุด


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1 REM WANG 2200:RTAF ACADEMY
2 REM DETERMINATION OF BEST MIX OF AIR TRANSPORT UNIT
3 REM BY VORAPOT KHOMPIS
10DIM B(20,3),C(3),A(20,3),Y(20,3),R(20),Q1(3),Z(3,3),X(3)
20 FOR I=1TO 3:READ C(I):NEXT I
25DATA 86800,14000,9800
30 FOR K=1TO 3:FOR J=1TO 20
40 READ B(J,K)
60 NEXT J:NEXT K
75 DATA 7300,400,20000,8000,10400,4500,0,7000,6000,20000,10000
76 DATA 6000,30000,40100,9000,0,0,60,0,0,0,0,11000,1000,6400,40000
77 DATA 40500,1500,2000,4000,2400,10000,13000,0,1800,80,190,40
78 DATA 12800,15000,6000,300,26000,8000,6500,21000,20000,11800,7800
79 DATA 22000,9000,15000,33000,38500,11000,80,190,90,12500,0
80 FOR I=1TO 3:FOR J=1TO 20
100 READ A(J,I)
110 NEXT J:NEXT I
125 DATA 13827,90,64830,0,24080,0,0,0,0,0,0,47886,11328,0,0,0,656
126 DATA 425,0,0,0,0,17500,6390,6500,22750,20313,13227,11974,12101
127 DATA 9479,12926,0,20278,17500,44,96,59,13383,16486,2500,0,11728
128 DATA 4283,4356,0,0,8864,8024,8110,6353,8663,0,0,11728,38,85,53,0,0
130 FOR K=1TO 3:IF K>1THEN 141
133PRINT HEX(0E); "*****":PRINT
134PRINT :PRINT HEX(0E);TAB(5); "DETERMINATION OF BEST MIX":PRINT
135PRINT HEX(0E);TAB(5); "OF AIR TRANSPORT UNIT":PRINT
136PRINT TAB(3); "*****":PRINT
137PRINT :PRINT HEX(0E);TAB(5); "BEST UNIT FOR EACH SITUATION"
138PRINT :PRINT :PRINT HEX(0E);TAB(5); "OPTIMAL SOLUTION; Y(I,J,K)":PRINT
139PRINT :PRINT :PRINT :PRINT HEX(0E);TAB(8); "BUILD-UP SITUATION(K=1)"
140GOTO 145
141 IF K=3THEN 144
142PRINT HEX(0E);TAB(8); "RE-SUPPLY SITUATION(K=2)"
143GOTO 145
144PRINT HEX(0E);TAB(8); "PHASE-OUT SITUATION(K=3)"
145 X1=0:X2=0:X3=0:PRINT :PRINT
148PRINT TAB(13); " MISSION           C-123B           UH-1H           AU-23"
149PRINT TAB(15); " (J)           (I=1)           (I=2)           (I=3)"
150 FOR J=1TO 20
160 IF B(J,K)<>0THEN 210
180 Y(J,I)=0
185 IF B(J,K)=0THEN 475
190 PRINT I:GOTO 500
210 FOR I=1TO 3
220 IF A(J,I)<>0THEN 250
230 R(I)=1E90
240 GOTO 320
250 Q=B(J,K)/A(J,I)
260 Q1(I)=INT(Q)
280IF (Q-Q1(I))=0THEN 310
290 R(I)=(Q1(I)+1)*C(I)
295 Q1(I)=Q1(I)+1
300 GOTO 320

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```

310 R(I)=Q+C(I)
320 NEXT I
330 IF R(1)>R(2)THEN 400
340 IF R(1)>R(3)THEN 420
350 I=1:I1=0
360 X1=X1+Q1(I)
370 GOTO 480
400 IF R(2)<R(3)THEN 450
420 I=3:I3=0
430 X3=X3+Q1(I)
440 GOTO 491
450 I=2:I2=0
470 X2=X2+Q1(I)
471 Y(J,I)=Q1(I)
472PRINT TAB(16);J;TAB(30);I2;TAB(44);Y(J,I);TAB(58);I2;GOTO 500
475PRINT TAB(16);J;TAB(31);"0";TAB(45);"0";TAB(59);"0";GOTO 500
480 Y(J,I)=Q1(I)
490PRINT TAB(16);J;TAB(30);Y(J,I);TAB(44);I1;TAB(58);I1;GOTO 500
491 Y(J,I)=Q1(I)
492PRINT TAB(16);J;TAB(30);I3;TAB(44);I3;TAB(58);Y(J,I);GOTO 500
500 NEXT J
504PRINT TAB(15);"*****"
505PRINT TAB(16);"X(I,K)";TAB(30);X1;TAB(44);X2;TAB(58);X3
510 Z(1,K)=X1
511 Z(2,K)=X2
513 Z(3,K)=X3
520PRINT TAB(15);"*****"
530 NEXT K
531 NEXT K
532 FOR I=1TO 3
541 IF Z(I,1)>Z(I,2)THEN 543
542 Z(I,1)=Z(I,2)
543 IF Z(I,1)>Z(I,3)THEN 550
544 Z(I,1)=Z(I,3)
550 NEXT I:PRINT :PRINT
560 PRINT HEX(0E);TAB(6);"OPTIMUM AIR TRANSPORT UNIT": PRINT
570 PRINT HEX(0E);TAB(12);"# C-123B =";Z(1,1)
580 PRINT HEX(0E);TAB(12);"# UH-1H =";Z(2,1)
590 PRINT HEX(0E);TAB(12);"# AU-23 =";Z(3,1)
600 C=Z(1,1)*C(1)+Z(2,1)*C(2)+Z(3,1)*C(3)
610 PRINT :PRINT HEX(0E);TAB(6);"MINIMUM COST(BAHTS) =";C:PRINT
620 PRINT :PRINT HEX(0E);"*****"
630 END

```

 DETERMINATION OF BEST MIX
 OF AIR TRANSPORT UNIT

 BEST UNIT FOR EACH SITUATION

OPTIMAL SOLUTION; Y(I, J, K)

BUILD-UP SITUATION(K=1)

| MISSION (J) | C-123B (I=1) | UH-1H (I=2) | AU-23 (I=3) |
|----------------|-----------------|----------------|----------------|
| 1 | 0 | 0 | 3 |
| 2 | 5 | 0 | 0 |
| 3 | 0 | 0 | 2 |
| 4 | 0 | 0 | 2 |
| 5 | 0 | 2 | 0 |
| 6 | 0 | 1 | 0 |
| 7 | 0 | 0 | 0 |
| 8 | 0 | 0 | 1 |
| 9 | 0 | 0 | 1 |
| 10 | 0 | 2 | 0 |
| 11 | 0 | 0 | 2 |
| 12 | 0 | 0 | 1 |
| 13 | 3 | 0 | 0 |
| 14 | 0 | 2 | 0 |
| 15 | 0 | 0 | 1 |
| 16 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 |
| 18 | 0 | 0 | 2 |
| 19 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 |
| ***** | ***** | ***** | ***** |
| X(L, K) | 8 | 7 | 15 |
| ***** | ***** | ***** | ***** |

RE-SUPPLY SITUATION(K=2)

| MISSION (J) | C-123B (I=1) | UH-1H (I=2) | AU-23 (I=3) |
|----------------|-----------------|----------------|----------------|
| 1 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 |
| 3 | 0 | 0 | 1 |
| 4 | 0 | 0 | 1 |
| 5 | 0 | 1 | 0 |
| 6 | 0 | 2 | 0 |
| 7 | 0 | 2 | 0 |
| 8 | 0 | 0 | 1 |
| 9 | 0 | 0 | 1 |
| 10 | 0 | 0 | 1 |
| 11 | 0 | 0 | 1 |
| 12 | 0 | 1 | 0 |
| 13 | 2 | 0 | 0 |
| 14 | 0 | 0 | 0 |
| 15 | 0 | 0 | 1 |
| 16 | 0 | 2 | 0 |
| 17 | 0 | 2 | 0 |
| 18 | 0 | 0 | 1 |
| 19 | 0 | 1 | 0 |
| 20 | 0 | 1 | 0 |

```

*****
X(L,K)      2      12      8
*****

```

PHASE-OUT SITUATION(K=3)

| MISSION (J) | C-123B (I=1) | UH-1H (I=2) | AU-23 (I=3) |
|----------------|-----------------|----------------|----------------|
| 1 | 0 | 0 | 3 |
| 2 | 4 | 0 | 0 |
| 3 | 0 | 2 | 0 |
| 4 | 0 | 0 | 2 |
| 5 | 0 | 1 | 0 |
| 6 | 0 | 1 | 0 |
| 7 | 0 | 1 | 0 |
| 8 | 0 | 1 | 0 |
| 9 | 0 | 0 | 1 |
| 10 | 0 | 2 | 0 |
| 11 | 0 | 1 | 0 |
| 12 | 0 | 0 | 2 |
| 13 | 3 | 0 | 0 |
| 14 | 0 | 2 | 0 |
| 15 | 0 | 0 | 1 |
| 16 | 0 | 2 | 0 |
| 17 | 0 | 2 | 0 |
| 18 | 0 | 0 | 2 |
| 19 | 0 | 1 | 0 |
| 20 | 0 | 0 | 0 |
| ***** | | | |
| X(I,K) | 7 | 16 | 11 |
| ***** | | | |

OPTIMUM AIR TRANSPORT UNIT

C-123B = 8
 # UH-1H = 16
 # AU-23 = 15

MINIMUM COST(BAHTS) = 1065400

ประวัติการศึกษา

ชื่อ เรืออากาศโท วรพจน์ ชำพิศ

การศึกษา สำเร็จการศึกษาชั้นปริญญาตรี วิทยาศาสตร์บัณฑิต (ทอ.) เครื่องกล
จากโรงเรียนนายเรืออากาศ คอนเมือง เมื่อปีการศึกษา 2516

ตำแหน่งและสถานที่ทำงาน ปัจจุบันปฏิบัติงานในหน้าที่ อาจารย์ผู้ช่วยกองวิชาเทคนิค
กองการศึกษาโรงเรียนนายเรืออากาศ คอนเมือง และเป็น
นายทหารวิเคราะห์ระบบกองวิจัย และพัฒนา ศูนย์วิจัยระบบและ
คำนวณ กองทัพอากาศ.