

## LAMPIRAN

Lampiran 1 Jumlah penumpang yang naik di setiap halte untuk setiap partisi waktu

| Halte (h) | Partisi waktu (p) |      |      |      |      |      |      |
|-----------|-------------------|------|------|------|------|------|------|
|           | 1                 | 2    | 3    | 4    | 5    | 6    | 7    |
| 1         | 118               | 266  | 146  | 157  | 147  | 320  | 86   |
| 2         | 72                | 134  | 86   | 99   | 79   | 171  | 53   |
| 3         | 49                | 86   | 66   | 68   | 68   | 105  | 30   |
| 4         | 51                | 97   | 83   | 85   | 77   | 119  | 36   |
| 5         | 40                | 82   | 53   | 52   | 52   | 97   | 26   |
| 6         | 30                | 79   | 32   | 56   | 36   | 91   | 15   |
| 7         | 127               | 177  | 140  | 158  | 148  | 203  | 101  |
| 8         | 21                | 57   | 33   | 34   | 35   | 65   | 15   |
| 9         | 34                | 58   | 47   | 47   | 49   | 77   | 25   |
| 10        | 42                | 81   | 51   | 52   | 53   | 99   | 28   |
| 11        | 26                | 60   | 39   | 40   | 41   | 80   | 15   |
| 12        | 19                | 50   | 30   | 32   | 33   | 64   | 14   |
| 13        | 46                | 75   | 67   | 69   | 69   | 92   | 33   |
| 14        | 31                | 48   | 38   | 37   | 40   | 59   | 24   |
| 15        | 128               | 161  | 141  | 145  | 145  | 187  | 97   |
| 16        | 48                | 63   | 52   | 51   | 53   | 77   | 32   |
| 17        | 117               | 135  | 124  | 123  | 125  | 152  | 91   |
| 18        | 52                | 71   | 61   | 63   | 64   | 84   | 34   |
| 19        | 127               | 159  | 147  | 144  | 148  | 175  | 106  |
| 20        | 27                | 47   | 32   | 30   | 32   | 56   | 21   |
| 21        | 105               | 161  | 130  | 142  | 132  | 178  | 80   |
| 22        | 24                | 50   | 36   | 39   | 38   | 64   | 16   |
| 23        | 110               | 135  | 121  | 123  | 117  | 166  | 93   |
| 24        | 29                | 46   | 34   | 37   | 35   | 68   | 21   |
| 25        | 37                | 58   | 45   | 44   | 46   | 73   | 29   |
| 26        | 21                | 58   | 28   | 48   | 30   | 77   | 15   |
| 27        | 15                | 59   | 37   | 42   | 41   | 70   | 13   |
| 28        | 30                | 70   | 29   | 51   | 32   | 81   | 21   |
| 29        | 26                | 63   | 41   | 52   | 42   | 75   | 17   |
| 30        | 24                | 67   | 39   | 57   | 33   | 82   | 20   |
| 31        | 104               | 134  | 120  | 124  | 120  | 159  | 83   |
| 32        | 42                | 51   | 49   | 45   | 47   | 58   | 31   |
| 33        | 50                | 77   | 63   | 65   | 60   | 83   | 36   |
| 34        | 36                | 49   | 42   | 39   | 41   | 57   | 27   |
| 35        | 39                | 55   | 46   | 47   | 46   | 61   | 28   |
| 36        | 27                | 42   | 31   | 38   | 30   | 50   | 23   |
| 37        | 0                 | 0    | 0    | 0    | 0    | 0    | 0    |
| Total     | 1924              | 3161 | 2359 | 2535 | 2384 | 3775 | 1435 |

Lampiran 2 Jumlah penumpang yang turun di setiap halte untuk setiap partisi waktu

| Halte (h) | Partisi waktu (p) |      |      |      |      |      |      |
|-----------|-------------------|------|------|------|------|------|------|
|           | 1                 | 2    | 3    | 4    | 5    | 6    | 7    |
| 1         | 0                 | 0    | 0    | 0    | 0    | 0    | 0    |
| 2         | 60                | 131  | 82   | 98   | 85   | 147  | 47   |
| 3         | 43                | 98   | 52   | 67   | 58   | 95   | 29   |
| 4         | 36                | 117  | 81   | 80   | 82   | 100  | 25   |
| 5         | 72                | 93   | 77   | 75   | 78   | 98   | 51   |
| 6         | 57                | 98   | 66   | 77   | 67   | 79   | 38   |
| 7         | 136               | 182  | 153  | 168  | 155  | 294  | 97   |
| 8         | 27                | 76   | 35   | 46   | 37   | 62   | 22   |
| 9         | 30                | 70   | 42   | 43   | 44   | 77   | 23   |
| 10        | 39                | 87   | 55   | 58   | 59   | 63   | 30   |
| 11        | 33                | 67   | 39   | 40   | 42   | 66   | 23   |
| 12        | 33                | 58   | 40   | 44   | 41   | 47   | 20   |
| 13        | 60                | 75   | 64   | 72   | 66   | 78   | 42   |
| 14        | 34                | 50   | 40   | 41   | 42   | 57   | 25   |
| 15        | 122               | 147  | 128  | 125  | 129  | 223  | 89   |
| 16        | 40                | 52   | 46   | 47   | 47   | 60   | 27   |
| 17        | 128               | 156  | 134  | 133  | 135  | 193  | 100  |
| 18        | 49                | 79   | 53   | 55   | 53   | 73   | 33   |
| 19        | 111               | 147  | 126  | 122  | 128  | 238  | 92   |
| 20        | 28                | 47   | 33   | 30   | 33   | 61   | 15   |
| 21        | 103               | 158  | 121  | 137  | 120  | 203  | 77   |
| 22        | 24                | 52   | 38   | 39   | 38   | 58   | 15   |
| 23        | 95                | 162  | 126  | 141  | 123  | 208  | 82   |
| 24        | 31                | 55   | 34   | 48   | 36   | 71   | 23   |
| 25        | 33                | 59   | 45   | 49   | 45   | 79   | 26   |
| 26        | 34                | 67   | 53   | 51   | 50   | 82   | 25   |
| 27        | 28                | 64   | 43   | 50   | 39   | 70   | 21   |
| 28        | 32                | 62   | 42   | 66   | 41   | 57   | 25   |
| 29        | 31                | 78   | 48   | 50   | 42   | 91   | 22   |
| 30        | 37                | 55   | 42   | 43   | 43   | 78   | 28   |
| 31        | 99                | 159  | 122  | 133  | 121  | 214  | 77   |
| 32        | 37                | 50   | 46   | 44   | 45   | 68   | 30   |
| 33        | 51                | 66   | 55   | 58   | 54   | 77   | 40   |
| 34        | 35                | 45   | 38   | 37   | 40   | 59   | 26   |
| 35        | 42                | 52   | 47   | 44   | 47   | 58   | 30   |
| 36        | 35                | 46   | 37   | 39   | 38   | 60   | 27   |
| 37        | 39                | 101  | 76   | 85   | 81   | 131  | 33   |
| Total     | 1924              | 3161 | 2359 | 2535 | 2384 | 3775 | 1435 |

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## Lampiran 3 *Syntax* dan *Output* program LINGO 19.0

### Fungsi tujuan pertama

```

MODEL:
SETS:
@Hak cipta milik IPB University
PARTISI/1..7/:KTP,Bp;
HALTE/1..37/;;
LINK(PARTISI,HALTE):PNNph,PNTph,PNph,KBph,KSph;
ENDSETS
!fungsi tujuan;
MAX=61505500-@SUM(PARTISI(P):11100*70*Bp(P));

!kendala;
!1;
@FOR(LINK(P,H):PNph(P,1)=PNNph(P,1));
!2;
@FOR(LINK(P,H)|H#LE#36:PNph(P,H+1)=PNph(P,H)+PNNph(P,H+1)-PNTph(P,H+1));
!3;
@FOR(PARTISI(P):KTP(P)=50*Bp(P));
!4;
@FOR(LINK(P,H):KBph(P,1)=KTP(P));
!5;
@FOR(LINK(P,H)|H#LE#36:KBph(P,H+1)=KTP(P)-PNph(P,H)+PNTph(P,H+1));
!6;
@FOR(LINK(P,H):KBph(P,1)>=PNNph(P,H));
!7;
@FOR(LINK(P,H):KSph(P,H)=KBph(P,H)-PNNph(P,H));
!8;
@FOR(LINK(P,H):@GIN(PNph(P,H)));
@FOR(LINK(P,H):@GIN(KBph(P,H)));
@FOR(LINK(P,H):@GIN(KSph(P,H)));
@FOR(PARTISI(P):@GIN(KTP(P)));
@FOR(PARTISI(P):@GIN(Bp(P)));
@FOR(LINK(P,H):PNph(P,H)>=0);
@FOR(LINK(P,H):KBph(P,H)>=0);
@FOR(LINK(P,H):KSph(P,H)>0);
@FOR(PARTISI(P):KTP(P)>=0);
@FOR(PARTISI(P):Bp(P)>=0);

Data:
PNNph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNNph PNTph
Transjakarta.xlsx");
PNTph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNNph PNTph
Transjakarta.xlsx");
enddata

```

## Lampiran 3 (Lanjutan)

Lingo 19.0 Solver Status [Lingo1]

|                                                                                                                                                                        |  |                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------|
| <b>Solver Status</b><br>Model Class: <b>PILP</b><br>State: <b>Global Opt</b><br>Objective: <b>3.58645e+007</b><br>Infeasibility: <b>0</b><br>Iterations: <b>0</b>      |  | <b>Variables</b><br>Total: <b>532</b><br>Nonlinear: <b>0</b><br>Integers: <b>532</b> |
| <b>Extended Solver Status</b><br>Solver Type: <b>B-and-B</b><br>Best Obj: <b>3.58645e+007</b><br>Obj Bound: <b>3.58645e+007</b><br>Steps: <b>0</b><br>Active: <b>0</b> |  | <b>Constraints</b><br>Total: <b>2080</b><br>Nonlinear: <b>0</b>                      |
|                                                                                                                                                                        |  | <b>Nonzeros</b><br>Total: <b>2352</b><br>Nonlinear: <b>0</b>                         |
|                                                                                                                                                                        |  | <b>Generator Memory Used (K)</b><br><b>297</b>                                       |
|                                                                                                                                                                        |  | <b>Elapsed Runtime (hh:mm:ss)</b><br><b>00:00:00</b>                                 |
| Update Interval: <b>2</b>                                                                                                                                              |  | Interrupt Solver <b>Close</b>                                                        |

Global optimal solution found.

|                          |               |
|--------------------------|---------------|
| Objective value:         | 0.3586450E+08 |
| Objective bound:         | 0.3586450E+08 |
| Infeasibilities:         | 0.000000      |
| Extended solver steps:   | 0             |
| Total solver iterations: | 0             |
| Elapsed runtime seconds: | 0.32          |

|        |          |          |
|--------|----------|----------|
| BP( 1) | 4.000000 | 777000.0 |
| BP( 2) | 6.000000 | 777000.0 |
| BP( 3) | 4.000000 | 777000.0 |
| BP( 4) | 4.000000 | 777000.0 |
| BP( 5) | 4.000000 | 777000.0 |
| BP( 6) | 8.000000 | 777000.0 |
| BP( 7) | 3.000000 | 777000.0 |

## Lampiran 3 (lanjutan)

### Fungsi tujuan kedua

MODEL:

SETS:

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PARTISI/1..7/:KTP, Bp, Wp;

HALTE/1..37/::

LINK (PARTISI, HALTE) : PNNph, PNTph, PNph, KBph, KSph;

ENDSETS

!fungsi tujuan;

MIN=(32685/2)\*(@SUM(PARTISI(P):Wp/Bp(P)));

!kendala;

!1;

@FOR(LINK(P,H):PNph(P,1)=PNNph(P,1));

!2;

@FOR(LINK(P,H)|H#LE#36:PNph(P,H+1)=PNph(P,H)+PNNph(P,H+1)-PNTph(P,H+1));

!3;

@FOR(PARTISI(P):KTP(P)=50\*Bp(P));

!4;

@FOR(LINK(P,H):KBph(P,1)=KTP(P));

!5;

@FOR(LINK(P,H)|H#LE#36:KBph(P,H+1)=KTP(P)-PNph(P,H)+PNTph(P,H+1));

!6;

@FOR(LINK(P,H):KBph(P,1)>=PNNph(P,H));

!7;

@FOR(LINK(P,H):KSph(P,H)=KBph(P,H)-PNNph(P,H));

!8;

@FOR(LINK(P,H):@GIN(PNph(P,H)));

@FOR(LINK(P,H):@GIN(KBph(P,H)));

@FOR(LINK(P,H):@GIN(KSph(P,H)));

@FOR(PARTISI(P):@GIN(KTP(P)));

@FOR(PARTISI(P):@GIN(Bp(P)));

@FOR(LINK(P,H):PNph(P,H)>=0);

@FOR(LINK(P,H):KBph(P,H)>=0);

@FOR(LINK(P,H):KSph(P,H)>0);

@FOR(PARTISI(P):KTP(P)>=0);

@FOR(PARTISI(P):Bp(P)>=0);

Data:

PNNph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNNph PNTph Transjakarta.xlsx");

PNTph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNNph PNTph Transjakarta.xlsx");

Wp=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNNph PNTph Transjakarta.xlsx");

enddata

## Lampiran 3 (lanjutan)

Lingo 19.0 Solver Status [Lingo\_OF 2 Bismillah]

| Solver Status  |            | Variables  |     |
|----------------|------------|------------|-----|
| Model Class:   | PINLP      | Total:     | 532 |
| State:         | Global Opt | Nonlinear: | 7   |
| Objective:     | 66391.4    | Integers:  | 532 |
| Infeasibility: | 0          |            |     |
| Iterations:    | 4          |            |     |

| Constraints |      | Nonzeros   |      |
|-------------|------|------------|------|
| Total:      | 2081 | Total:     | 2359 |
| Nonlinear:  | 1    | Nonlinear: | 7    |

| Extended Solver Status |         | Generator Memory Used (K) |  |
|------------------------|---------|---------------------------|--|
| Solver Type:           | B-and-B | 298                       |  |
| Best Obj:              | 66391.4 |                           |  |
| Obj Bound:             | 66391.4 |                           |  |
| Steps:                 | 0       |                           |  |
| Active:                | 0       |                           |  |

Update Interval:

Elapsed Runtime (hh:mm:ss): 00:00:00

Global optimal solution found.

|                          |          |
|--------------------------|----------|
| Objective value:         | 66391.41 |
| Objective bound:         | 66391.41 |
| Infeasibilities:         | 0.000000 |
| Extended solver steps:   | 0        |
| Total solver iterations: | 4        |
| Elapsed runtime seconds: | 0.24     |

|          |          |          |
|----------|----------|----------|
| BP ( 1 ) | 4.000000 | 0.000000 |
| BP ( 2 ) | 6.000000 | 0.000000 |
| BP ( 3 ) | 4.000000 | 0.000000 |
| BP ( 4 ) | 4.000000 | 0.000000 |
| BP ( 5 ) | 4.000000 | 0.000000 |
| BP ( 6 ) | 8.000000 | 0.000000 |
| BP ( 7 ) | 3.000000 | 0.000000 |

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1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :  
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## Lampiran 4 Data arus penumpang

### Data penumpang di dalam bus

| Halte (h) | Partisi waktu (p) |     |     |     |     |     |     |
|-----------|-------------------|-----|-----|-----|-----|-----|-----|
|           | 1                 | 2   | 3   | 4   | 5   | 6   | 7   |
| 1         | 118               | 266 | 146 | 157 | 147 | 320 | 86  |
| 2         | 130               | 269 | 150 | 158 | 141 | 344 | 92  |
| 3         | 136               | 257 | 164 | 159 | 151 | 354 | 93  |
| 4         | 151               | 237 | 166 | 164 | 146 | 373 | 104 |
| 5         | 119               | 226 | 142 | 141 | 120 | 372 | 79  |
| 6         | 92                | 207 | 108 | 120 | 89  | 384 | 56  |
| 7         | 83                | 202 | 95  | 110 | 82  | 293 | 60  |
| 8         | 77                | 183 | 93  | 98  | 80  | 296 | 53  |
| 9         | 81                | 171 | 98  | 102 | 85  | 296 | 55  |
| 10        | 84                | 165 | 94  | 96  | 79  | 332 | 53  |
| 11        | 77                | 158 | 94  | 96  | 78  | 346 | 45  |
| 12        | 63                | 150 | 84  | 84  | 70  | 363 | 39  |
| 13        | 49                | 150 | 87  | 81  | 73  | 377 | 30  |
| 14        | 46                | 148 | 85  | 77  | 71  | 379 | 29  |
| 15        | 52                | 162 | 98  | 97  | 87  | 343 | 37  |
| 16        | 60                | 173 | 104 | 101 | 93  | 360 | 42  |
| 17        | 49                | 152 | 94  | 91  | 83  | 319 | 33  |
| 18        | 52                | 144 | 102 | 99  | 94  | 330 | 34  |
| 19        | 68                | 156 | 123 | 121 | 114 | 267 | 48  |
| 20        | 67                | 156 | 122 | 121 | 113 | 262 | 54  |
| 21        | 69                | 159 | 131 | 126 | 125 | 237 | 57  |
| 22        | 69                | 157 | 129 | 126 | 125 | 243 | 58  |
| 23        | 84                | 130 | 124 | 108 | 119 | 201 | 69  |
| 24        | 82                | 121 | 124 | 97  | 118 | 198 | 67  |
| 25        | 86                | 120 | 124 | 92  | 119 | 192 | 70  |
| 26        | 73                | 111 | 99  | 89  | 99  | 187 | 60  |
| 27        | 60                | 106 | 93  | 81  | 101 | 187 | 52  |
| 28        | 58                | 114 | 80  | 66  | 92  | 211 | 48  |
| 29        | 53                | 99  | 73  | 68  | 92  | 195 | 43  |
| 30        | 40                | 111 | 70  | 82  | 82  | 199 | 35  |
| 31        | 45                | 86  | 68  | 73  | 81  | 144 | 41  |
| 32        | 50                | 87  | 71  | 74  | 83  | 134 | 42  |
| 33        | 49                | 98  | 79  | 81  | 89  | 140 | 38  |
| 34        | 50                | 102 | 83  | 83  | 90  | 138 | 39  |
| 35        | 47                | 105 | 82  | 86  | 89  | 141 | 37  |
| 36        | 39                | 101 | 76  | 85  | 81  | 131 | 33  |
| 37        | 0                 | 0   | 0   | 0   | 0   | 0   | 0   |

## Lampiran 4 (lanjutan)

Data kapasitas bus yang tersedia sebelum penumpang naik

| Halte (h) | Partisi waktu (p) |     |     |     |     |     |     |
|-----------|-------------------|-----|-----|-----|-----|-----|-----|
|           | 1                 | 2   | 3   | 4   | 5   | 6   | 7   |
| 1         | 200               | 300 | 200 | 200 | 200 | 400 | 150 |
| 2         | 142               | 165 | 136 | 141 | 138 | 227 | 111 |
| 3         | 113               | 129 | 102 | 109 | 117 | 151 | 87  |
| 4         | 100               | 160 | 117 | 121 | 131 | 146 | 82  |
| 5         | 121               | 156 | 111 | 111 | 132 | 125 | 97  |
| 6         | 138               | 172 | 124 | 136 | 147 | 107 | 109 |
| 7         | 244               | 275 | 245 | 248 | 266 | 310 | 191 |
| 8         | 144               | 174 | 140 | 136 | 155 | 169 | 112 |
| 9         | 153               | 187 | 149 | 145 | 164 | 181 | 120 |
| 10        | 158               | 216 | 157 | 156 | 174 | 167 | 125 |
| 11        | 149               | 202 | 145 | 144 | 163 | 134 | 120 |
| 12        | 156               | 200 | 146 | 148 | 163 | 101 | 125 |
| 13        | 197               | 225 | 180 | 188 | 196 | 115 | 153 |
| 14        | 185               | 200 | 153 | 160 | 169 | 80  | 145 |
| 15        | 276               | 299 | 243 | 248 | 258 | 244 | 210 |
| 16        | 188               | 190 | 148 | 150 | 160 | 117 | 140 |
| 17        | 268               | 283 | 230 | 232 | 242 | 233 | 208 |
| 18        | 200               | 227 | 159 | 164 | 170 | 154 | 150 |
| 19        | 259               | 303 | 224 | 223 | 234 | 308 | 208 |
| 20        | 160               | 191 | 110 | 109 | 119 | 194 | 117 |
| 21        | 236               | 302 | 199 | 216 | 207 | 341 | 173 |
| 22        | 155               | 193 | 107 | 113 | 113 | 221 | 108 |
| 23        | 226               | 305 | 197 | 215 | 198 | 365 | 174 |
| 24        | 147               | 225 | 110 | 140 | 117 | 270 | 104 |
| 25        | 151               | 238 | 121 | 152 | 127 | 281 | 109 |
| 26        | 148               | 247 | 129 | 159 | 131 | 290 | 105 |
| 27        | 155               | 253 | 144 | 161 | 140 | 283 | 111 |
| 28        | 172               | 256 | 149 | 185 | 140 | 270 | 123 |
| 29        | 173               | 264 | 168 | 184 | 150 | 280 | 124 |
| 30        | 184               | 256 | 169 | 175 | 151 | 283 | 135 |
| 31        | 259               | 348 | 252 | 251 | 239 | 415 | 192 |
| 32        | 192               | 264 | 178 | 171 | 164 | 324 | 139 |
| 33        | 201               | 279 | 184 | 184 | 171 | 343 | 148 |
| 34        | 186               | 247 | 159 | 156 | 151 | 319 | 138 |
| 35        | 192               | 250 | 164 | 161 | 157 | 320 | 141 |
| 36        | 188               | 241 | 155 | 153 | 149 | 319 | 140 |
| 37        | 200               | 300 | 200 | 200 | 200 | 400 | 150 |

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## Lampiran 4 (lanjutan)

Data kapasitas bus yang tersedia setelah penumpang naik

| Halte (h) | Partisi waktu (p) |     |     |     |     |     |     |
|-----------|-------------------|-----|-----|-----|-----|-----|-----|
|           | 1                 | 2   | 3   | 4   | 5   | 6   | 7   |
| 1         | 82                | 34  | 54  | 43  | 53  | 80  | 64  |
| 2         | 70                | 31  | 50  | 42  | 59  | 56  | 58  |
| 3         | 64                | 43  | 36  | 41  | 49  | 46  | 57  |
| 4         | 49                | 63  | 34  | 36  | 54  | 27  | 46  |
| 5         | 81                | 74  | 58  | 59  | 80  | 28  | 71  |
| 6         | 108               | 93  | 92  | 80  | 111 | 16  | 94  |
| 7         | 117               | 98  | 105 | 90  | 118 | 107 | 90  |
| 8         | 123               | 117 | 107 | 102 | 120 | 104 | 97  |
| 9         | 119               | 129 | 102 | 98  | 115 | 104 | 95  |
| 10        | 116               | 135 | 106 | 104 | 121 | 68  | 97  |
| 11        | 123               | 142 | 106 | 104 | 122 | 54  | 105 |
| 12        | 137               | 150 | 116 | 116 | 130 | 37  | 111 |
| 13        | 151               | 150 | 113 | 119 | 127 | 23  | 120 |
| 14        | 154               | 152 | 115 | 123 | 129 | 21  | 121 |
| 15        | 148               | 138 | 102 | 103 | 113 | 57  | 113 |
| 16        | 140               | 127 | 96  | 99  | 107 | 40  | 108 |
| 17        | 151               | 148 | 106 | 109 | 117 | 81  | 117 |
| 18        | 148               | 156 | 98  | 101 | 106 | 70  | 116 |
| 19        | 132               | 144 | 77  | 79  | 86  | 133 | 102 |
| 20        | 133               | 144 | 78  | 79  | 87  | 138 | 96  |
| 21        | 131               | 141 | 69  | 74  | 75  | 163 | 93  |
| 22        | 131               | 143 | 71  | 74  | 75  | 157 | 92  |
| 23        | 116               | 170 | 76  | 92  | 81  | 199 | 81  |
| 24        | 118               | 179 | 76  | 103 | 82  | 202 | 83  |
| 25        | 114               | 180 | 76  | 108 | 81  | 208 | 80  |
| 26        | 127               | 189 | 101 | 111 | 101 | 213 | 90  |
| 27        | 140               | 194 | 107 | 119 | 99  | 213 | 98  |
| 28        | 142               | 186 | 120 | 134 | 108 | 189 | 102 |
| 29        | 147               | 201 | 127 | 132 | 108 | 205 | 107 |
| 30        | 160               | 189 | 130 | 118 | 118 | 201 | 115 |
| 31        | 155               | 214 | 132 | 127 | 119 | 256 | 109 |
| 32        | 150               | 213 | 129 | 126 | 117 | 266 | 108 |
| 33        | 151               | 202 | 121 | 119 | 111 | 260 | 112 |
| 34        | 150               | 198 | 117 | 117 | 110 | 262 | 111 |
| 35        | 153               | 195 | 118 | 114 | 111 | 259 | 113 |
| 36        | 161               | 199 | 124 | 115 | 119 | 269 | 117 |
| 37        | 200               | 300 | 200 | 200 | 200 | 400 | 150 |

## Lampiran 5 Syntax dan Output Program LINGO 19.0 pada model *fuzzy goal programming*

```

MODEL:
SETS:
  PARTISI/1..7/:KTp,Bp,Wp;
  HALTE/1..37/;;
@LINK(PARTISI,HALTE):PNNph,PNTph,PNph,KBph,KSph;
ENDSETS
!fungsi tujuan;
MAX=LAMBDA;

!kendala;
(61505500-@SUM(PARTISI(P):11100*70*Bp(P)))+(35864500-
35000000)*LAMBDA>=35000000;
((32685/2)*(@SUM(PARTISI(P):Wp/Bp(P)))+(70000-66391.41)*LAMBDA<=70000;
LAMBDA>=0;
LAMBDA<=1;

!1;
@FOR(LINK(P,H):PNph(P,1)=PNNph(P,1));
!2;
@FOR(LINK(P,H)|H#LE#36:PNph(P,H+1)=PNph(P,H)+PNNph(P,H+1)-PNTph(P,H+1));
!3;
@FOR(PARTISI(P):KTp(P)=50*Bp(P));
!4;
@FOR(LINK(P,H):KBph(P,1)=KTp(P));
!5;
@FOR(LINK(P,H)|H#LE#36:KBph(P,H+1)=KTp(P)-PNph(P,H)+PNTph(P,H+1));
!6;
@FOR(LINK(P,H):KBph(P,1)>=PNNph(P,H));
!7;
@FOR(LINK(P,H):KSph(P,H)=KBph(P,H)-PNNph(P,H));
!8;
@FOR(LINK(P,H):@GIN(PNph(P,H)));
@FOR(LINK(P,H):@GIN(KBph(P,H)));
@FOR(LINK(P,H):@GIN(KSph(P,H)));
@FOR(PARTISI(P):@GIN(KTp(P)));
@FOR(PARTISI(P):@GIN(Bp(P)));
@FOR(LINK(P,H):PNph(P,H)>=0);
@FOR(LINK(P,H):KBph(P,H)>=0);
@FOR(LINK(P,H):KSph(P,H)>0);
@FOR(PARTISI(P):KTp(P)>=0);
@FOR(PARTISI(P):Bp(P)>=0);

Data:
PNNph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNNph PNTph
Transjakarta.xlsx");
PNTph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNNph PNTph
Transjakarta.xlsx");
Wp=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNNph PNTph
Transjakarta.xlsx");
PNph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data PNph
Transjakarta.xlsx");

```

## Lampiran 5 (Lanjutan)

```
KBph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data KBph  
Transjakarta.xlsx");  
KSph=@ole("C:\Users\hanii\OneDrive\Documents\SKRIPSI\Data KSph  
Transjakarta.xlsx");  
@Enddata
```

@Hak cipta milik IPB University



```
Global optimal solution found.  
Objective value: 0.9999983  
Infeasibilities: 0.000000  
Total solver iterations: 0  
Elapsed runtime seconds: 1.67
```

```
BP( 1) 4.000000 0.000000  
BP( 2) 6.000000 0.000000  
BP( 3) 4.000000 0.000000  
BP( 4) 4.000000 0.000000  
BP( 5) 4.000000 0.000000  
BP( 6) 8.000000 0.000000  
BP( 7) 3.000000 0.000000
```