**LATIHAN *UNBALANCED TRANSPORTATION*RISET OPERASI**

**TEKNIK INFORMATIKA UNIKOM**

1. Fungsi Tujuan : (**Kasus Kebutuhan > Kapasitas**)

Minimalkan Z = 8X11 + 5X12 + 6X13+ 15X21 + 10X22 + 12X23 + 3X31 + 9X32 + 10X33

Fungsi Pembatas :

***Petunjuk:***

1. *Setelah mendapatkan solusi awal yang layak dengan ketiga metode diatas lalu gunakan metode* ***Stepping Stone*** *untuk mengecek kondisi optimal dari tabel solusi awal yang ditentukan dengan metode* ***Vogel.***
2. *Gunakan metode* ***Multiplier*** *dan solusi awal* ***Least Cost*** *untuk mendapatkan solusi optimal*

X11 + X12 + X13 = 120

X21 + X22 + X23 = 80

X31 + X32 + X33 = 80

X11 + X21 + X33 ≤ 150

X12 + X22 + X32 ≤ 70

X13 + X23 + X33 ≤ 90

Xij ≥ 0, i = 1, 2, 3 dan j = 1, 2, 3

**PokiaPokaba Least Cost Metode Multipier**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Iterasi 0 | Lokasi  1 | Lokasi  2 | Lokasi  3 | Kapasitas |
| Pabrik  1 |  |  |  |  |
| Pabrik  2 |  |  |  |  |
| Pabrik  3 |  |  |  |  |
| Dummy |  |  |  |  |
| Kebutuhan |  |  |  |  |

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| --- | --- | --- | --- | --- |
| Iterasi 0 | Lokasi  1 | Lokasi  2 | Lokasi  3 | Kapasitas |
| Pabrik  1 |  |  |  |  |
| Pabrik  2 |  |  |  |  |
| Pabrik  3 |  |  |  |  |
| Dummy |  |  |  |  |
| Kebutuhan |  |  |  |  |

z = z =

**Vogel**

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| --- | --- | --- | --- | --- |
| Iterasi 0 | Lokasi  1 | Lokasi  2 | Lokasi  3 | Kapasitas |
| Pabrik  1 |  |  |  |  |
| Pabrik  2 |  |  |  |  |
| Pabrik  3 |  |  |  |  |
| Dummy |  |  |  |  |
| Kebutuhan |  |  |  |  |

**Metode Stepping Stone**

**Keterangan**

Metode Least-Cost, kotak-kotak dummy dapat **diabaikan** dan alokasi dibuat sesuai dengan biaya minimum, setelah alokasi dilakukan. **Kelebihannya dialokasikan ke variabel dummy yang cocok**. Metode VAM, nilai Cij dummy digunakan sebagai biaya kolom terkecil ketika menghitung opportunity cost. Metode Stepping Stone dan Multiplier, kotak-kotak dummy diperlakukan seperti kotak-kotak yang lainnya.

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| Iterasi 2 | Lokasi  1 | Lokasi  2 | Lokasi  3 | Kapasitas |
| Pabrik  1 |  |  |  |  |
| Pabrik  2 |  |  |  |  |
| Pabrik  3 |  |  |  |  |
| Dummy |  |  |  |  |
| Kebutuhan |  |  |  |  |

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| --- | --- | --- | --- | --- |
| Iterasi 1 | Lokasi  1 | Lokasi  2 | Lokasi  3 | Kapasitas |
| Pabrik  1 |  |  |  |  |
| Pabrik  2 |  |  |  |  |
| Pabrik  3 |  |  |  |  |
| Dummy |  |  |  |  |
| Kebutuhan |  |  |  |  |

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2.Alat-alat rumah tangga akan dikirim dari 4 buah distributor (A,B,C,D) ke toko (1,2,3) Jumlah barang yang akan dikirim ke distributor A,B,C,D adalah 300, 200, 600, dan 500 unit. Kebutuhan toko 1, toko 2, toko 3 adalah 200, 1000, dan 400 unit. Besar biaya transportasi untuk mengangkut barang di berikan pada tabel berikut ini

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Toko 1** | **Toko 2** | **Toko 3** |
| **Distributor A** | 5 | 3 | 6 |
| **Distributor B** | 2 | 9 | 4 |
| **Distributor C** | 3 | 7 | 8 |
| **Distributor D** | 6 | 1 | 4 |

Hitung total biaya minimum yang harus dikeluarkan (gunakan solusi awal dengan metode NWC)

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| --- | --- | --- | --- | --- |
| Iterasi | Toko  1 | Toko  2 | Toko  3 | Kapasitas |
| A |  |  |  |  |
| B |  |  |  |  |
| C |  |  |  |  |
| D |  |  |  |  |
| Kebutuhan |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Iterasi | Toko  1 | Toko  2 | Toko  3 | Kapasitas |
| A |  |  |  |  |
| B |  |  |  |  |
| C |  |  |  |  |
| D |  |  |  |  |
| Kebutuhan |  |  |  |  |

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| --- | --- | --- | --- | --- |
| Iterasi | Toko  1 | Toko  2 | Toko  3 | Kapasitas |
| A |  |  |  |  |
| B |  |  |  |  |
| C |  |  |  |  |
| D |  |  |  |  |
| Kebutuhan |  |  |  |  |

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| --- | --- | --- | --- | --- |
| Iterasi | Toko  1 | Toko  2 | Toko  3 | Kapasitas |
| A |  |  |  |  |
| B |  |  |  |  |
| C |  |  |  |  |
| D |  |  |  |  |
| Kebutuhan |  |  |  |  |