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Lampiran 1 : Surat Balasan Dari UD Bakery Garden

UD Bakery Garden P.Siantar
Jalan Catur, Kel.Banjar, Kecamatan Siantar Barat,
Kota Pematangsiantar, Sumatera Utara 21112

Hal : Balasan

Kepada Yth :
Dr. Mhd. Syahnan, M.A
Dekan Fakultas Sains dan Teknologi
Universitas Islam Negeri Sumatera Utara

Dengan Hormat,

Yang bertanda tangan di bawah ini :

Nama : Budi Sanjaya
Jabatan : Pemilik UD Bakery Garden

Menerapkan bahwa

Nama : **Putri Rizky Febrianti**
Nim : 0703183160
Fakultas : SAINTEK (Sains & Teknologi)
Prodi : Matematika-3/Sem.VIII


Telah kami setuju untuk mengadakan penelitian di UD Bakery Garden dengan permasalahan dan judul :

Optimisasi Biaya Transportasi Distribusi Di UD Bakery Garfden Menggunakan Metode MDMA (Maximum Divide Minimum Alloment)

Demikian surat ini kami sampaikan dan atas kerja samanya kami mengucapkan terima kasih.

Pematangsiantar, Maret 2022

Hormat Kami,
Pemilik UD Bakery Garden,


Budi Sanjaya

Lampiran 2 : Teks Wawancara dengan Pemilik UD Bakery Garden

Hasil Wawancara

Narasumber : Pemilik UD Bakery Garden

Saya : Selamat Siang, saya Putri yang kemarin ini melakukan penelitian disini. Mohon maaf bapak telah mengganggu waktunya. Sesuai dengan jadwal penelitian yang telah ditentukan kemarin, hari ini saya melakukan wawancara dengan bapak.

Pemilik : Selamat Siang dek, iya saya ingat. Tidak mengganggu kok dek. Kan kita juga sudah menentukan waktunya, silahkan apa yang ingin ditanyakan dek.

Saya : Untuk pertama saya ingin tanyakan mengenai proses distribusi roti kemasan disini bagaimana ya pak?

Pemilik : Kalau untuk distribusi disini itu kita lakukan secara sytem permintaan pesanan dek, jadi kami mengirimkan sesuai dengan permintaan dari konsumen.

Saya : untuk pendistribusiannya itu apakah per kecamatan di pematangsiantar ini saja pak?

Pemilik : Sebenarnya ada juga kesimalungun tapi untuk lebih seringnya kami pendistribusiannya ke kecamatan siantar ini saja dek. Kecamatan Siantar Barat, Siantar Marihat, Siantar Marimbun, Siantar Martoba, Siantar Sitalasari, Siantar Utara.

Saya : Apakah ada faktor yang mempengaruhi biaya pendistribusian?

Pemilik : Untuk faktornya itu dek contohnya dalam perjalanan ada terjadi tak terduga ban bocor dan semacamnya itu. Tapi kita kan sudah memiliki budget. Jadi misalkan bulan ini sekian, itu untuk setiap bulan lah kita harus ada budgetnya. Sistemnya cost-cost yang harus dikeluarkan jika sudah berlebihan kita mengeremnya.

Saya : Distribusi kan pastinya menggunakan alat transportasi, itu ada jenis alat transportasi apa saja ya pak?

Pemilik : Untuk jenis kendaraan kita disini kita ada 3 ya, ada 3 sepeda motor, 4 becak barang, 2 Mobil box.

Saya : Terus pak, untuk rata-rata perharinya atau setiap pengantarannya itu biaya pengantarannya berapa ya pak?

Pemilik : Kita perhitungannya itu setiap berapa Km sekitar dari Rp. 7.950 – Rp. 27.825.

Saya : Untuk muatannya pak, maksimumnya berapa ya pak?

Pemilik : Setiap muatannya berbeda – beda, seperti Sepeda Motor hanya dapat mengangkut 300, Becak Barang dapat mengangkut sebanyak sekitar 600 an dan Mobil Box dapat mengangkut sampai 800 an dek.

Saya : Untuk gaji pokok sendiri itu perkaryawannya berapa ya pak?

Pemilik : Kita sistem gaji perhari gajinya sekitar Rp. 80.000 dek.

Saya : Untuk permintaan sendiri itu bagaimana ya pak?

Pemilik : Permintaan itu tergantung dari pasar dek, untuk itu ada pembukuannya jika butuh data itu bisa di tanyak sama kakak yang di bagian data itu ya.

Saya : Baik pak, sepertinya hanya itu saja data yang ingin saya butuhkan pak. Terima kasih pak atas waktu luangnya untuk informasi kepada saya dan telah membantu penelitian saya.

Pemilik : Terima kasih kembali dek, semoga cepat kelar dan sukses dalam menyelesaikan skripsinya semoga dilancarkan semuanya.

Saya : aamiin, terima kasih pak.

Lampiran 3 : Biaya Tetap dan Biaya Tidak Tetap Bulan Juli 2022

Biaya Tetap

1. Gaji pokok Karyawan

| Alat Transportasi | Gaji Pokok Karyawan |
|-------------------|---------------------|
| Sepeda Motor | Rp. 80.000,00 |
| Becak Barang | Rp. 80.000,00 |
| Mobil Box | Rp. 80.000,00 |

Gaji Pokok Perbulan

| Alat Transportasi | Gaji Pokok Karyawan |
|-------------------|---------------------------------------|
| Sepeda Motor | Rp. 80.000,00 x 30 = Rp. 2.400.000,00 |
| Becak Barang | Rp. 80.000,00 x 30 = Rp. 2.400.000,00 |
| Mobil Box | Rp. 80.000,00 x 30 = Rp. 2.400.000,00 |

2. Biaya Perawatan

| Alat Transportasi | Gaji Pokok Karyawan |
|-------------------|---------------------|
| Sepeda Motor | Rp. 150.000,00 |
| Becak Barang | Rp. 150.000,00 |
| Mobil Box | Rp. 250.000,00 |

Tabel Biaya Tetap

| Alat Transportasi | Biaya Tetap | | Total Biaya Tetap |
|-------------------|-----------------|---------------|-------------------|
| | Gaji Karyawan | Perawatan | |
| Sepeda Motor | Rp.2.400.000,00 | Rp.150.000,00 | Rp.2.550.000,00 |
| Becak Barang | Rp.2.400.000,00 | Rp.150.000,00 | Rp.2.550.000,00 |
| Mobil Box | Rp.2.400.000,00 | Rp.250.000,00 | Rp.2.650.000,00 |

Biaya Tidak Tetap

| Kecamatan | Jarak tempuh dalam satu kali pengiriman |
|--------------------|---|
| Siantar Barat | 2 Km x 2 = 4 Km |
| Siantar Marihat | 4 Km x 2 = 8 Km |
| Siantar Marimbun | 5 Km x 2 = 10 Km |
| Siantar Martoba | 7 Km x 2 = 14 Km |
| Siantar Sitalasari | 2 Km x 2 = 4 Km |
| Siantar Utara | 3 Km x 2 = 6 Km |

Tabel Biaya Bahan Bakar Sepeda Motor

| Kecamatan | Jarak tempuh | Biaya Bahan Bakar Transportasi Sepeda Motor |
|--------------------|--------------|---|
| Siantar Barat | 2 Km | Rp. 7.950 |
| Siantar Marihat | 4 Km | Rp. 15.900 |
| Siantar Marimbun | 5 Km | Rp. 19.875 |
| Siantar Martoba | 7 Km | Rp. 27.825 |
| Siantar Sitalasari | 2 Km | Rp. 7.950 |
| Siantar Utara | 3 Km | Rp. 11.925 |

Tabel Biaya Bahan Bakar Transportasi Becak Barang

| Kecamatan | Jarak tempuh | Biaya Bahan Bakar Transportasi Sepeda Motor |
|--------------------|--------------|---|
| Siantar Barat | 2 Km | Rp. 7.950 |
| Siantar Marihat | 4 Km | Rp. 15.900 |
| Siantar Marimbun | 5 Km | Rp. 19.875 |
| Siantar Martoba | 7 Km | Rp. 27.825 |
| Siantar Sitalasari | 2 Km | Rp. 7.950 |
| Siantar Utara | 3 Km | Rp. 11.925 |

Tabel Biaya Bahan Bakar Transportasi Mobil Box

| Kecamatan | Jarak tempuh | Biaya Bahan Bakar Transportasi Sepeda Motor |
|--------------------|--------------|---|
| Siantar Barat | 2 Km | Rp. 7.950 |
| Siantar Marihat | 4 Km | Rp. 15.900 |
| Siantar Marimbun | 5 Km | Rp. 19.875 |
| Siantar Martoba | 7 Km | Rp. 27.825 |
| Siantar Sitalasari | 2 Km | Rp. 7.950 |
| Siantar Utara | 3 Km | Rp. 11.925 |

| Sumber | Tujuan | | | | | |
|--------|--------|----|----|----|----|----|
| | B1 | B2 | B3 | B4 | B5 | B6 |
| A1 | 25 | 23 | 26 | 12 | 17 | 26 |
| A2 | 26 | 26 | 26 | 12 | 17 | 26 |
| A3 | 16 | 15 | 16 | 12 | 17 | 26 |

| Kecamatan | Biaya Tidak Tetap (Biaya Transportasi per bulan) | | |
|---------------|--|--------------|--------------|
| | A1 | A2 | A3 |
| Siantar Barat | Rp. 7.950 x 25 = | 7.950 x 26 = | 7.950 x 16 = |

| | | | |
|---------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | Rp.198.750 | Rp.206.700 | Rp.127.200 |
| Siantar Marihat | 15.900 x 23 = Rp.365.700 | 15.900 x 26 = Rp413.400 | 15.900 x 15 = Rp.238.500 |
| Siantar Marimbun | 19.875 x 26 = Rp.119.250 | 19.875 x 26 = Rp.516.750 | 19.875 x 16 = Rp.318.000 |
| Siantar Martoba | 0 | 0 | 27.825 x 12 = Rp.333.900 |
| Siantar Sitalasari | 0 | 0 | 7.950 x 17 = Rp.135.150 |
| Siantar Utara | 11.925 x 26 = Rp.310.050 | 11.925 x 26 = Rp.310.050 | 0 |

| Kecamatan | Biaya Tidak Tetap (Biaya Transportasi per bulan) | | |
|---------------------------|---|-------------------------------------|-------------------------------------|
| | A1 | A2 | A3 |
| Siantar Barat | Rp. 7.950 x 25 = Rp.198.750 | 7.950 x 26 = Rp.206.700 | 7.950 x 16 = Rp.127.200 |
| Siantar Marihat | 15.900 x 23 = Rp.365.700 | 15.900 x 26 = Rp413.400 | 15.900 x 15 = Rp.238.500 |
| Siantar Marimbun | 19.875 x 26 = Rp.119.250 | 19.875 x 26 = Rp.516.750 | 19.875 x 16 = Rp.318.000 |
| Siantar Martoba | 27.825 x 12 = Rp.333.900 | 27.825 x 12 = Rp.333.900 | 27.825 x 12 = Rp.333.900 |
| Siantar Sitalasari | 7.950 x 17 = Rp.135.150 | 7.950 x 17 = Rp.135.150 | 7.950 x 17 = Rp.135.150 |
| Siantar Utara | 11.925 x 26 = Rp.310.050 | 11.925 x 26 = Rp.310.050 | 11.925 x 26 = Rp.310.050 |

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Lampiran 4 : Data Rata – rata Permintaan Roti Kemasan Bulan Juli 2022

Data Rata-rata Permintaan Roti Kemasan

| No | Kecamatan | Rata-rata | Kendaraan |
|-----|--------------------|-----------|-----------|
| 1. | Siantar Barat | 200 | A1 |
| 2. | Siantar Barat | 680 | A2 |
| 3. | Siantar Barat | 280 | A3 |
| 4. | Siantar Marihat | 230 | A1 |
| 5. | Siantar Marihat | 280 | A2 |
| 6. | Siantar Marihat | 470 | A3 |
| 7. | Siantar Marimbun | 300 | A1 |
| 8. | Siantar Marimbun | 350 | A2 |
| 9. | Siantar Marimbun | 800 | A3 |
| 12. | Siantar Martoba | 410 | A3 |
| 15. | Siantar Sitalasari | 350 | A3 |
| 16. | Siantar Utara | 230 | A1 |
| 17. | Siantar Utara | 520 | A2 |

| No | Kecamatan | Permintaan | Total Permintaan |
|-----|--------------------|------------|------------------|
| 1. | Siantar Barat | 200 | 1160 |
| 2. | Siantar Barat | 680 | |
| 3. | Siantar Barat | 280 | |
| 4. | Siantar Marihat | 230 | 980 |
| 5. | Siantar Marihat | 280 | |
| 6. | Siantar Marihat | 470 | |
| 7. | Siantar Marimbun | 300 | 1450 |
| 8. | Siantar Marimbun | 350 | |
| 9. | Siantar Marimbun | 800 | |
| 12. | Siantar Martoba | 410 | 410 |
| 15. | Siantar Sitalasari | 550 | 550 |
| 16. | Siantar Utara | 230 | 750 |
| 17. | Siantar Utara | 520 | |
| | | 5300 | 5300 |

| Tujuan | Sumber | | |
|--------------------|--------|-----|-----|
| | A1 | A2 | A3 |
| Siantar Barat | 200 | 680 | 280 |
| Siantar Marihat | 230 | 580 | 470 |
| Siantar Marimbun | 300 | 550 | 800 |
| Siantar Martoba | 410 | 610 | 410 |
| Siantar Sitalasari | 550 | 550 | 550 |

| | | | |
|----------------------|-------------|-------------|-------------|
| Siantar Utara | 230 | 520 | 520 |
| Jumlah | 1920 | 3490 | 3030 |

Hasil Perhitungan Biaya Transportasi Per Kardus Roti Kemasan

| Tujuan | Sumber | | |
|---------------------------|---|--|--|
| | Sepeda Motor | Becak Barang | Mobil Box |
| Siantar Barat | $\frac{198.750 + 2.550.000}{200} = 13743$ | $\frac{206.700 + 2.550.000}{680} = 4054$ | $\frac{127.200 + 2.650.000}{280} = 9919$ |
| Siantar Marihat | $\frac{365.700 + 2.550.000}{230} = 12677$ | $\frac{413.400 + 2.550.000}{580} = 5109$ | $\frac{238.500 + 2.650.000}{470} = 6146$ |
| Siantar Marimbun | $\frac{119.250 + 2.550.000}{300} = 8898$ | $\frac{516.750 + 2.550.000}{350} = 8762$ | $\frac{318.000 + 2.650.000}{800} = 3710$ |
| Siantar Martoba | $\frac{333.900 + 2.550.000}{410} = 6302$ | $\frac{333.900 + 2.550.000}{410} = 6302$ | $\frac{333.900 + 2.650.000}{410} = 6546$ |
| Siantar Sitalasari | $\frac{135.150 + 2.550.000}{550} = 4882$ | $\frac{135.150 + 2.550.000}{550} = 4882$ | $\frac{135.150 + 2.650.000}{550} = 5064$ |
| Siantar Utara | $\frac{310.050 + 2.550.000}{230} = 12435$ | $\frac{310.000 + 2.550.000}{520} = 5500$ | $\frac{190.800 + 2.650.000}{520} = 5463$ |



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Lampiran 5 : Pembuktian Menggunakan Software LCM Online

Solution Help

Solution will be displayed step by step (In 3 parts)

Solution

Find Solution using Least Cost method

| | D1 | D2 | D3 | D4 | D5 | D6 | Supply |
|--------|-------|-------|------|------|------|-------|--------|
| S1 | 13743 | 12677 | 8898 | 6320 | 4882 | 12435 | 1920 |
| S2 | 4054 | 5190 | 8762 | 6320 | 4882 | 5500 | 3490 |
| S3 | 9919 | 6146 | 3710 | 6546 | 5064 | 5463 | 3030 |
| Demand | 1160 | 980 | 1450 | 410 | 550 | 750 | |

Solution:

TOTAL number of supply constraints : 3
 TOTAL number of demand constraints : 6
 Problem Table is

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | Supply |
|--------|-------|-------|-------|-------|-------|-------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320 | 4882 | 12435 | 1920 |
| S_2 | 4054 | 5190 | 8762 | 6320 | 4882 | 5500 | 3490 |
| S_3 | 9919 | 6146 | 3710 | 6546 | 5064 | 5463 | 3030 |
| Demand | 1160 | 980 | 1450 | 410 | 550 | 750 | |

Here Total Demand = 5300 is less than Total Supply = 8440. So We add a dummy demand constraint with 0 unit cost and with allocation 3140.

Here Total Demand = 5300 is less than Total Supply = 8440. So We add a dummy demand constraint with 0 unit cost and with allocation 3140.

Now, The modified table is

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|-------|-------|-------|-------|-------|-------|-------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320 | 4882 | 12435 | 0 | 1920 |
| S_2 | 4054 | 5190 | 8762 | 6320 | 4882 | 5500 | 0 | 3490 |
| S_3 | 9919 | 6146 | 3710 | 6546 | 5064 | 5463 | 0 | 3030 |
| Demand | 1160 | 980 | 1450 | 410 | 550 | 750 | 3140 | |

Here dummy column is used and method is LCM. So we first allocate cells except dummy column and at last step in dummy column

The smallest transportation cost is 3710 in cell S_3D_3

The allocation to this cell is $\min(3030, 1450) = 1450$.

This satisfies the entire demand of D_3 and leaves $3030 - 1450 = 1580$ units with S_3

Table-1

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|-------|-------|------------|-------|-------|-------|-------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320 | 4882 | 12435 | 0 | 1920 |
| S_2 | 4054 | 5190 | 8762 | 6320 | 4882 | 5500 | 0 | 3490 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463 | 0 | 1580 |
| Demand | 1160 | 980 | 0 | 410 | 550 | 750 | 3140 | |



The smallest transportation cost is 4054 in cell S_2D_1

The allocation to this cell is $\min(3490, 1160) = 1160$.

This satisfies the entire demand of D_1 and leaves $3490 - 1160 = 2330$ units with S_2

Table-2

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|------------|-------|------------|-------|-------|-------|-------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320 | 4882 | 12435 | 0 | 1920 |
| S_2 | 4054(1160) | 5190 | 8762 | 6320 | 4882 | 5500 | 0 | 2330 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463 | 0 | 1580 |
| Demand | 0 | 980 | 0 | 410 | 550 | 750 | 3140 | |

The smallest transportation cost is 4882 in cell S_1D_5

The allocation to this cell is $\min(1920, 550) = 550$.

This satisfies the entire demand of D_5 and leaves $1920 - 550 = 1370$ units with S_1



The smallest transportation cost is 4882 in cell S_1D_5

The allocation to this cell is $\min(1920,550) = 550$.

This satisfies the entire demand of D_5 and leaves $1920 - 550=1370$ units with S_1

Table-3

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|------------|-------|------------|-------|-----------|-------|-------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320 | 4882(550) | 12435 | 0 | 1370 |
| S_2 | 4054(1160) | 5190 | 8762 | 6320 | 4882 | 5500 | 0 | 2330 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463 | 0 | 1580 |
| Demand | 0 | 980 | 0 | 410 | 0 | 750 | 3140 | |

The smallest transportation cost is 5190 in cell S_2D_2

The allocation to this cell is $\min(2330,980) = 980$.

This satisfies the entire demand of D_2 and leaves $2330 - 980=1350$ units with S_2

Table-4

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|------------|-----------|------------|-------|-----------|-------|-------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320 | 4882(550) | 12435 | 0 | 1370 |
| S_2 | 4054(1160) | 5190(980) | 8762 | 6320 | 4882 | 5500 | 0 | 1350 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463 | 0 | 1580 |
| Demand | 0 | 0 | 0 | 410 | 0 | 750 | 3140 | |

The smallest transportation cost is 5463 in cell S_3D_6

The allocation to this cell is $\min(1580,750) = 750$.

This satisfies the entire demand of D_6 and leaves $1580 - 750=830$ units with S_3

Table-5

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|------------|-----------|------------|-------|-----------|-----------|-------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320 | 4882(550) | 12435 | 0 | 1370 |
| S_2 | 4054(1160) | 5190(980) | 8762 | 6320 | 4882 | 5500 | 0 | 1350 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463(750) | 0 | 830 |
| Demand | 0 | 0 | 0 | 410 | 0 | 0 | 3140 | |

The smallest transportation cost is 6320 in cell S_1D_4

The allocation to this cell is $\min(1370,410) = 410$



The allocation to this cell is $\min(1370, 410) = 410$.
 This satisfies the entire demand of D_4 and leaves $1370 - 410 = 960$ units with S_1

Table-6

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|------------|-----------|------------|-----------|-----------|-----------|-------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320(410) | 4882(550) | 12435 | 0 | 960 |
| S_2 | 4054(1160) | 5190(980) | 8762 | 6320 | 4882 | 5500 | 0 | 1350 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463(750) | 0 | 830 |
| Demand | 0 | 0 | 0 | 0 | 0 | 0 | 3140 | |

The smallest transportation cost is 0 in cell S_2D_{dummy}

The allocation to this cell is $\min(1350, 3140) = 1350$.
 This exhausts the capacity of S_2 and leaves $3140 - 1350 = 1790$ units with D_{dummy}

Table-7

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|-----------------------------|-----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|--------------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320(410) | 4882(550) | 12435 | 0 | 960 |
| S_2 | 4054(1160) | 5190(980) | 8762 | 6320 | 4882 | 5500 | 0(1350) | 0 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463(750) | 0 | 830 |
| Demand | 0 | 0 | 0 | 0 | 0 | 0 | 1790 | |

The smallest transportation cost is -1 in cell S_2D_{dummy}

The allocation to this cell is $\min(0, 1790) = 0$.
 This exhausts the capacity of S_2 and leaves $1790 - 0 = 1790$ units with D_{dummy}

Table-8

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|-----------------------------|-----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|--------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320(410) | 4882(550) | 12435 | 0 | 960 |
| S_2 | 4054(1160) | 5190(980) | 8762 | 6320 | 4882 | 5500 | 0 | 0 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463(750) | 0 | 830 |
| Demand | 0 | 0 | 0 | 0 | 0 | 0 | 1790 | |

The smallest transportation cost is -1 in cell S_2D_{dummy}

The allocation to this cell is $\min(0, 1790) = 0$.
 This exhausts the capacity of S_2 and leaves $1790 - 0 = 1790$ units with D_{dummy}

Table-9

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|-----------------------------|-----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|--------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320(410) | 4882(550) | 12435 | 0 | 960 |
| S_2 | 4054(1160) | 5190(980) | 8762 | 6320 | 4882 | 5500 | 0 | 0 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463(750) | 0 | 830 |
| Demand | 0 | 0 | 0 | 0 | 0 | 0 | 1790 | |

The smallest transportation cost is -1 in cell S_2D_{dummy}

The allocation to this cell is $\min(0, 1790) = 0$.

This exhausts the capacity of S_2 and leaves $1790 - 0 = 1790$ units with D_{dummy}

Table-10

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|-----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|--------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320(410) | 4882(550) | 12435 | 0 | 960 |
| S_2 | 4054(1160) | 5190(980) | 8762 | 6320 | 4882 | 5500 | 0 | 0 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463(750) | 0 | 830 |
| Demand | 0 | 0 | 0 | 0 | 0 | 0 | 1790 | |

The smallest transportation cost is -1 in cell S_2D_{dummy}

The allocation to this cell is $\min(0, 1790) = 0$.

This exhausts the capacity of S_2 and leaves $1790 - 0 = 1790$ units with D_{dummy}

Table-11

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|-----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|--------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320(410) | 4882(550) | 12435 | 0 | 960 |
| S_2 | 4054(1160) | 5190(980) | 8762 | 6320 | 4882 | 5500 | 0 | 0 |
| S_3 | 9919 | 6146 | 3710(1450) | 6546 | 5064 | 5463(750) | 0 | 830 |
| Demand | 0 | 0 | 0 | 0 | 0 | 0 | 1790 | |

Initial feasible solution is

| | D_1 | D_2 | D_3 | D_4 | D_5 | D_6 | D_{dummy} | Supply |
|--------|-------------|------------|-------------|------------|------------|------------|-------------|--------|
| S_1 | 13743 | 12677 | 8898 | 6320 (410) | 4882 (550) | 12435 | 0 | 1920 |
| S_2 | 4054 (1160) | 5190 (980) | 8762 | 6320 | 4882 | 5500 | 0 | 3490 |
| S_3 | 9919 | 6146 | 3710 (1450) | 6546 | 5064 | 5463 (750) | 0 | 3030 |
| Demand | 1160 | 980 | 1450 | 410 | 550 | 750 | 3140 | |

The minimum total transportation cost

$$= 6320 \times 410 + 4882 \times 550 + 4054 \times 1160 + 5190 \times 980 + 3710 \times 1450 + 5463 \times 750 = 24541890$$

Here, the number of allocated cells = 6, which is three less than to $m + n - 1 = 3 + 7 - 1 = 9$

\therefore This solution is degenerate

Lampiran 6 : Dokumentasi Wawancara dengan Pemilik

