****

**Tabel Data Mentah**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bulan** | **Produk** | | | |
| **Air Mineral Aqua** | **Beras Anak Daro Solok** | **Gas LPG 12 Kg** | **Tepung Terigu** |
| Januari | 50 | 250 | 100 | 8 |
| Februari | 100 | 200 | 80 | 10 |
| Maret | 50 | 150 | 75 | 15 |
| April | 50 | 200 | 110 | 10 |
| Mei | 100 | 200 | 105 | 13 |
| Juni | 30 | 250 | 80 | 20 |
| Juli | 50 | 150 | 90 | 20 |
| Agustus | 30 | 200 | 90 | 10 |
| September | 100 | 150 | 110 | 7 |
| Oktober | 50 | 250 | 95 | 5 |
| November | 50 | 300 | 100 | 7 |
| Desember | 40 | 200 | 100 | 15 |
| TOTAL | 700 | 2500 | 1135 | 140 |

**Tabel Keterangan Produk**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Nama Barang** | **Satuan** | **Harga Jual** |
| 1 | Air Mineral Aqua | Kardus | Rp. 31.000 |
| 2 | Beras Anak Daro Solok | Karung | Rp. 135.000 |
| 3 | Tepung Terigu | Sak | RP. 175.000 |
| 4 | Gas LPG 12 Kg | Tabung | Rp. 155.000 |

**Menentukan Distribusi Kemungkinan dan Distribusi Kumulatif**

Pada distribusi penjualan barang dapat ditentukan distribusi kemungkinan dan distribusi kumulatif serta pembentukan interval dari variabel penjualan

PDF= F/J

Dimana :

PDF = probabilitas distribusi frekuensi

F = frekuensi

J = jumlah

**Produk Air Mineral Aqua**

Distribusi kumulatif serta pembentukan interval dari produk air mineral aqua dapat dilihat sebagai berikut :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Frekuensi** | **Prob** | **CDF** | **Batas Ri** |
| 1 | 50 | 0.071 | 0.071 | 0<r<0.071 |
| 2 | 100 | 0.143 | 0.214 | 0.071<r<0.214 |
| 3 | 50 | 0.071 | 0.285 | 0.214<r<0.285 |
| 4 | 50 | 0.071 | 0.356 | 0.285<r<0.356 |
| 5 | 100 | 0.143 | 0.499 | 0.356<r<0.499 |
| 6 | 30 | 0.043 | 0.542 | 0.499<r<0.542 |
| 7 | 50 | 0.071 | 0.613 | 0.542<r<0.613 |
| 8 | 30 | 0.043 | 0.656 | 0.0.613<r<0.656 |
| 9 | 100 | 0.143 | 0.799 | 0.656<r<0.799 |
| 10 | 50 | 0.071 | 0.870 | 0.799<r<0.870 |
| 11 | 50 | 0.071 | 0.941 | 0.87<r<0.941 |
| 12 | 40 | 0.057 | 0.998 | 0.941<r<0.998 |
| Jumlah | 700 |  |  |  |

**Produk Beras Anak Daro**

Distribusi kumulatif serta pembentukan interval dari produk beras dapat dilihat sebagai berikut :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Demand** | **Prob** | **CDF** | **Batas Ri** |
| 1 | 250 | 0.100 | 0.10 | 0<r<0.1 |
| 2 | 200 | 0.080 | 0.18 | 0.1<r<0.18 |
| 3 | 150 | 0.060 | 0.24 | 0.18<r<0.24 |
| 4 | 200 | 0.080 | 0.32 | 0.24<r<0.32 |
| 5 | 200 | 0.080 | 0.40 | 0.32<r<0.40 |
| 6 | 250 | 0.100 | 0.50 | 0.40<r<0.50 |
| 7 | 150 | 0.060 | 0.56 | 0.50<r<0.56 |
| 8 | 200 | 0.080 | 0.64 | 0.56<r<0.64 |
| 9 | 150 | 0.060 | 0.70 | 0.64<r<0.70 |
| 10 | 250 | 0.100 | 0.80 | 0.7<r<0.8 |
| 11 | 300 | 0.120 | 0.92 | 0.8<r<0.92 |
| 12 | 200 | 0.080 | 1.00 | 0.92<r<1 |
| Jumlah | 2500 |  |  |  |

**Produk Gas LPG 12 Kg**

Distribusi kumulatif serta pembentukan interval dari produk gas dapat dilihat sebagai berikut :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Demand** | **Prob** | **CDF** | **Batas Ri** |
| 1 | 100 | 0.088 | 0.088 | 0<r<0.088 |
| 2 | 80 | 0.070 | 0.158 | 0.088<r<0.158 |
| 3 | 75 | 0.066 | 0.225 | 0.158<r<0.225 |
| 4 | 110 | 0.097 | 0.321 | 0.225<r<0.321 |
| 5 | 105 | 0.093 | 0.414 | 0.321<r<0.414 |
| 6 | 80 | 0.070 | 0.484 | 0.414<r<0.484 |
| 7 | 90 | 0.079 | 0.564 | 0.484<r<0.564 |
| 8 | 90 | 0.079 | 0.643 | 0.564<r<0.643 |
| 9 | 110 | 0.097 | 0.740 | 0.643<r<0.740 |
| 10 | 95 | 0.084 | 0.824 | 0.740<r<0.824 |
| 11 | 100 | 0.088 | 0.912 | 0.824<r<0.912 |
| 12 | 100 | 0.088 | 1.000 | 0.912<r<1 |
| Jumlah | 1135 |  |  |  |

**Produk Tepung Terigu**

Distribusi kumulatif serta pembentukan interval dari produk tepung terigu dapat dilihat sebagai berikut :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Demand** | **Prob** | **CDF** | **Batas Ri** |
| 1 | 8 | 0.058 | 0.058 | 0<r<0.058 |
| 2 | 10 | 0.071 | 0.129 | 0.058<r<0.129 |
| 3 | 15 | 0.107 | 0.236 | 0.129<r<0.236 |
| 4 | 10 | 0.071 | 0.307 | 0.236<r<0.307 |
| 5 | 13 | 0.092 | 0.399 | 0.307<r<0.399 |
| 6 | 20 | 0.143 | 0.541 | 0.399<r<0.541 |
| 7 | 20 | 0.143 | 0.683 | 0.541<r<0.683 |
| 8 | 10 | 0.070 | 0.753 | 0.683<r<0.753 |
| 9 | 7 | 0.050 | 0.803 | 0.753<r<0.803 |
| 10 | 5 | 0.040 | 0.843 | 0.803<r<0.843 |
| 11 | 7 | 0.050 | 0.893 | 0.843<r<0.893 |
| 12 | 15 | 0.107 | 1.000 | 0.893<r<1 |
| Jumlah | 140 |  |  |  |

**Menghitung Angka Random**

Menentukan angka random yang digunakan untuk mendapatkan nilai persediaan dilakukan dengan rumus LCM (*Linear Congruent Method*). Dalam penarikan angka random untuk mendapatkan perkiraan persediaan barang menggunakan asumsi sendiri, dengan menggunakan rumus simulasi sebagai berikut :

Xi+1 = (a.Xi+C) mod m

Dimana :

a = konstanta perkalian

C = kenaikan

Xi = nilai awal yang ditentukan

M = bilangan tetap

Xi+1 = bilangan acak ke i dan Ri

Dengan a = 19 C= 237 Z0= 12357 M= 128

X1 =(a.Z0+c) mod m R1= Zi/m

=(19\*12357+237) mod 128 = 12/128 = 0,0937

= 235020 mod 128

= 1836 \* 128

= 235008 = 235020-235008 = 12

X2 =(a.Z1+c) mod m

=(19\*12+237) mod 128 R2 = Zi/m

= 465 mod 128 = 81/128 = 0,6328

= 3 \* 128

= 384 = 465-384 = 81

X3 =(a.Z2+c) mod m

=(19\*81+237) mod 128 R3 = Zi/m

= 1776 mod 128 = 112/128 = 0,875

= 31 \* 128

= 1664 = 1776-1664= 112

X4 =(a.Z3+c) mod m

=(19\*112+237) mod 128 R4 = Zi/m

= 2365 mod 128 = 61/128 = 0,4765

= 18 \* 128

= 2304 = 2365-2304= 61

X5 =(a.Z4+c) mod m

=(19\*61+237) mod 128 R5 = Zi/m

= 1396 mod 128 = 116/128 = 0,9062

= 10 \* 128 = 1280 = 1396- 1280= 116

X6 =(a.Z5+c) mod m

=(19\*116+237) mod 128 R6 = Zi/m

= 2441 mod 128 = 9/128 = 0,0703

= 19 \* 128

= 2441 = 2441-2432= 9

X7 =(a.Z6+c) mod m

=(19\*9+237) mod 128 R7 = Zi/m

= 408 mod 128 = 24/128 = 0,1875

= 3 \* 128

= 384 = 408-384= 24

X8 =(a.Z7+c) mod m

=(19\*24+237) mod 128 R8 = Zi/m

= 693 mod 128 = 53/128 = 0,4140

= 5 \* 128

= 640 = 693-640 = 53

X9 =(a.Z8+c) mod m

=(19\*53+237) mod 128 R9 = Zi/m

= 1244 mod 128 = 92/128 = 0,7187

= 9 \* 128

= 1152 = 1244-1152 = 92

X10 =(a.Z9+c) mod m

=(19\*92+237) mod 128 R10 = Zi/m

= 1985 mod 128 = 65/128 = 0,5078

= 15 \* 128

= 1920 = 1985-1920 = 65

X11 =(a.Z10+c) mod m

=(19\*65+237) mod 128 R11 = Zi/m

= 1472 mod 128 = 64/128 = 0,5

=11 \* 128

= 1408 = 1472-1408 = 64

X12 =(a.Z11+c) mod m

=(19\*64+237) mod 128 R12 = Zi/m

= 1453 mod 128 = 45/128 = 0,3515

= 11 \* 128

= 1408 = 1453-1408 = 45

**Hasil Simulasi Produk Air Mineral Aqua**

|  |  |  |
| --- | --- | --- |
| **Bulan** | **Random** | **Hasil** |
| 1 | 0.0937 | 100 |
| 2 | 0.6328 | 30 |
| 3 | 0.875 | 50 |
| 4 | 0.4765 | 100 |
| 5 | 0.9062 | 50 |
| 6 | 0.0703 | 50 |
| 7 | 0.1875 | 100 |
| 8 | 0.414 | 100 |
| 9 | 0.7187 | 100 |
| 10 | 0.5078 | 30 |
| 11 | 0.5 | 30 |
| 12 | 0.3515 | 50 |
| Jumlah |  | 790 |
| 790/12= 65.83 | | |

**Hasil Simulasi Produk Beras Anak Daro**

|  |  |  |
| --- | --- | --- |
| **Bulan** | **Random** | **Hasil** |
| 1 | 0.0937 | 250 |
| 2 | 0.6328 | 200 |
| 3 | 0.875 | 300 |
| 4 | 0.4765 | 250 |
| 5 | 0.9062 | 300 |
| 6 | 0.0703 | 250 |
| 7 | 0.1875 | 150 |
| 8 | 0.414 | 250 |
| 9 | 0.7187 | 250 |
| 10 | 0.5078 | 150 |
| 11 | 0.5 | 250 |
| 12 | 0.3515 | 200 |
| Jumlah | | 2800 |
| Rata-rata | | 2800/12=233.33 |

**Hasil Simulasi Produk Gas LPG 12 Kg**

|  |  |  |
| --- | --- | --- |
| **Bulan** | **Random** | **Hasil** |
| 1 | 0.0937 | 80 |
| 2 | 0.6328 | 110 |
| 3 | 0.875 | 100 |
| 4 | 0.4765 | 90 |
| 5 | 0.9062 | 100 |
| 6 | 0.0703 | 100 |
| 7 | 0.1875 | 75 |
| 8 | 0.414 | 80 |
| 9 | 0.7187 | 95 |
| 10 | 0.5078 | 90 |
| 11 | 0.5 | 90 |
| 12 | 0.3515 | 80 |
| Jumlah | | 1010 |
| Rata-rata | | 1010/12=84.16 |

**Hasil Simulasi Produk Tepung Terigu**

|  |  |  |
| --- | --- | --- |
| **Bulan** | **Random** | **Hasil** |
| 1 | 0.0937 | 10 |
| 2 | 0.6328 | 20 |
| 3 | 0.875 | 7 |
| 4 | 0.4765 | 20 |
| 5 | 0.9062 | 15 |
| 6 | 0.0703 | 10 |
| 7 | 0.1875 | 15 |
| 8 | 0.414 | 20 |
| 9 | 0.7187 | 10 |
| 10 | 0.5078 | 20 |
| 11 | 0.5 | 20 |
| 12 | 0.3515 | 15 |
| Jumlah | | 180 |
| Rata-rata | | 180/12= 15 |

Dari pencarian manual diatas didapatkan hasil dari masing-masing produk berdasarkan random yang digunakan dengan kemungkinan penjualan barang dalam 12 bulan yang akan datang adalah :

1. Produk air mineral aqua = 65.83 dibulatkan menjadi 66 kardus permintaan.
2. Produk beras anak daro = 233.33 dibulatkan menjadi 233 karung permintaan
3. Produk gas LPG = 84.16 dibulatkan menjadi 84 tabung permintaan
4. Produk tepung terigu = 15 sak permintaan tepung terigu.