**LANGKAH LANGKAH PENGERJAAN TOPSIS**

1. Kriterianya terdapat energi, protein, lemak dan karbo
2. Alternatif = menu
3. Data menu

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

1. Pembobotan pada setiap kriteria (nilai bobot ini belom fix, nanti hari kamis fixnya sesudah nanya ke dokter)
   1. Berat badan underweight

|  |  |  |
| --- | --- | --- |
| Kode | Kriteria | Bobot |
| C1 | Energi | 20 |
| C2 | Protein | 10 |
| C3 | Lemak | 30 |
| C4 | Karbohidrat | 40 |

* 1. Berat badan normal

|  |  |  |
| --- | --- | --- |
| Kode | Kriteria | Bobot |
| C1 | Energi | 40 |
| C2 | Protein | 10 |
| C3 | Lemak | 20 |
| C4 | Karbohidrat | 30 |

* 1. Berat badan overwight

|  |  |  |
| --- | --- | --- |
| Kode | Kriteria | Bobot |
| C1 | Energi | 40 |
| C2 | Protein | 30 |
| C3 | Lemak | 10 |
| C4 | Karbohidrat | 20 |

1. Matriks keputusan ternormalisasi (A)

Rumusnya

Langkah langkahnya :

**Kriteria Energi** : Data pertama kriteria energi / jumlah data pada kriteria energi

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

**Kriteria Energi** : Data kedua kriteria energi / jumlah data pada kriteria energi

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

*Dst..*

**Kriteria Protein** : Data pertama kriteria protein / jumlah data pada kriteria protein

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

0,507383

**Kriteria Protein** : Data kedua kriteria protein / jumlah data pada kriteria protein

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

0,338255

*Dst...*

**Kriteria Lemak** : Data pertama kriteria lemak / jumlah data pada kriteria lemak

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

0,338062

**Kriteria Lemak** : Data pertama kriteria lemak / jumlah data pada kriteria lemak

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

0,540899

**Kriteria Karbo** : Data pertama kriteria karbo / jumlah data pada kriteria karbo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

0,340522

**Kriteria Karbo** : Data pertama kriteria karbo / jumlah data pada kriteria karbo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 2 | Bubur Kentang Telur Kornet (2 Porsi) | 246 | 10 | 16 | 17 |
| 3 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 4 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 5 | Bubur Kentang Telur Keju (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 7 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |
| 8 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 9 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |

0,231555

Matriksnya :

karbo

lemak

protein

energi

1. Matriks keputusan ternormalisasi terbobot (dari hasil matriks keputusan ternormalisasi dikali dengan bobot (*contoh yang dipakai bobot normal*))

Rumusnya

Langkah langkahnya :

energi

protein

lemak

karbo

**Energi** (karna bobot energi 40) :

karbo

lemak

protein

energi

0,x 40 = 13,32393

*Dst...*

**Protein** (karna bobot protein 10) :

energi

protein

lemak

karbo

0,507383 x 10 = 5,07383

*Dst...*

**Lemak** (karna bobot lemak 20) :

energi

protein

lemak

karbo

karbo

lemak

protein

energi

0,338062 x 20 = 6,76123

*Dst...*

**Karbo** (karna bobot karbo 30) :

0,340522 x 30 = 10,21567

*Dst...*

karbo

lemak

protein

energi

Maka hasil dari nilai tsb mendapatkan matriks :

energi

karbo

protein

lemak

1. Menentukan ideal positif dan negatif
   1. Positif

dari hasil matriks Y dicari mana nilai yang paling besar

energi

protein

lemak

karbo

**Energi**

13,32392; 13,26998; 7,76779; 9,00848; 13,26998; 19,14977; 11,11226; 13,86335; 15,69741 = 19,14977

**Protein**

5,07383; 3,38255; 2,02953; 1,69128; 3,38255; 3,72081; 4,39732; 2,36779; 2,36779 = 5,07383

**Lemak**

6,76123; 10,81797; 2,02837; 6,76123; 10,81797; 4,73286; 3,38062; 5,40899; 2,70449 = 10,81797

**Karbo**

10,21567; 6,94666; 10,21567; 12,66743; 6,94666; 14,71057; 2,04313; 6,53803; 13,07606 = 14,71057

* 1. Negatif

dari hasil matriks Y dicari mana nilai yang paling kecil

energi

protein

lemak

karbo

**Energi**

13,32392; 13,26998; 7,76779; 9,00848; 13,26998; 19,14977; 11,11226; 13,86335; 15,69741 = 7,76779

**Protein**

5,07383; 3,38255; 2,02953; 1,69128; 3,38255; 3,72081; 4,39732; 2,36779; 2,36779 = 1,69128

**Lemak**

6,76123; 10,81797; 2,02837; 6,76123; 10,81797; 4,73286; 3,38062; 5,40899; 2,70449 = 2,02837

**Karbo**

10,21567; 6,94666; 10,21567; 12,66743; 6,94666; 14,71057; 2,04313; 6,53803; 13,07606 = 2,04313

Maka mendapatkan tabel :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A+ | 19,14977 | 5,07383 | 10,81797 | 14,71057 |
| A- | 7,76779 | 1,69128 | 2,02837 | 2,04313 |

1. Menentukan jarak setial alternatif dengan matriks ideal positif dan negatif
   1. Jarak denga matriks ideal positif

Rumusnya :

Perhitungannya hasil dari solusi ideal positif – ternormalisasi terbobot

**Solusi ideal positif** Alternatif 1 = menu 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A+ | 19,14977 | 5,07383 | 10,81797 | 14,71057 |
| A- | 7,76779 | 1,69128 | 2,02837 | 2,04313 |

**Matriks ternormalisasi terbobot**

**Solusi ideal positif** Alternatif 2 = menu 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A+ | 19,14977 | 5,07383 | 10,81797 | 14,71057 |
| A- | 7,76779 | 1,69128 | 2,02837 | 2,04313 |

**Matriks ternormalisasi terbobot**

*Dst...*

Maka menghasilkan :

|  |  |
| --- | --- |
| D+ | Hasil |
| D1+ | 8,402481 |
| D2+ | 9,884867 |
| D3+ | 15,37135 |
| D4+ | 11,61546 |
| D5+ | 9,884867 |
| D6+ | 6,233718 |
| D7+ | 16,7582 |
| D8+ | 11,45933 |
| D9+ | 9,367047 |

* 1. Jarak denga matriks ideal negatif

Rumusnya :

Perhitungannya hasil dari solusi ideal negatif – ternormalisasi terbobot

**Solusi ideal negatif** Alternatif 1 = menu 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A+ | 19,14977 | 5,07383 | 10,81797 | 14,71057 |
| A- | 7,76779 | 1,69128 | 2,02837 | 2,04313 |

**Matriks ternormalisasi terbobot**

**Solusi ideal negatif** Alternatif 2 = menu 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A+ | 19,14977 | 5,07383 | 10,81797 | 14,71057 |
| A- | 7,76779 | 1,69128 | 2,02837 | 2,04313 |

**Matriks ternormalisasi terbobot**

Dst...

Maka menghasilkan :

| D- | Hasil |
| --- | --- |
| D1- | 11,467457 |
| D2- | 11,59466 |
| D3- | 8,1795335 |
| D4- | 11,696795 |
| D5- | 11,59466 |
| D6- | 17,362212 |
| D7- | 4,5096208 |
| D8- | 8,3214278 |
| D9- | 13,62054 |

1. Menghitung nilai preferensi

Rumusnya :

Perhitungaanya nilai dari alternatif 1 = menu ke 1 yang telah dihitung pada tahap menentukan jarak antar ideal positif dan negatif

**Alternatif 1 = menu ke 1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| D+ | Hasil |  |  | D- | Hasil |
| D1+ | 8,402481 |  |  | D1- | 11,467457 |
| D2+ | 9,884867 |  |  | D2- | 11,59466 |
| D3+ | 15,37135 |  |  | D3- | 8,1795335 |
| D4+ | 11,61546 |  |  | D4- | 11,696795 |
| D5+ | 9,884867 |  |  | D5- | 11,59466 |
| D6+ | 6,233718 |  |  | D6- | 17,362212 |
| D7+ | 16,7582 |  |  | D7- | 4,5096208 |
| D8+ | 11,45933 |  |  | D8- | 8,3214278 |
| D9+ | 9,367047 |  |  | D9- | 13,62054 |

**Alternatif 2 = menu ke 2**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| D+ | Hasil |  |  | D- | Hasil |
| D1+ | 8,402481 |  |  | D1- | 11,467457 |
| D2+ | 9,884867 |  |  | D2- | 11,59466 |
| D3+ | 15,37135 |  |  | D3- | 8,1795335 |
| D4+ | 11,61546 |  |  | D4- | 11,696795 |
| D5+ | 9,884867 |  |  | D5- | 11,59466 |
| D6+ | 6,233718 |  |  | D6- | 17,362212 |
| D7+ | 16,7582 |  |  | D7- | 4,5096208 |
| D8+ | 11,45933 |  |  | D8- | 8,3214278 |
| D9+ | 9,367047 |  |  | D9- | 13,62054 |

*Dst...*

Maka menghasilkan nilai preferensi :

|  |  |
| --- | --- |
|  | Hasil |
| V1 | 0,577126 |
| V2 | 0,539801 |
| V3 | 0,347313 |
| V4 | 0,501745 |
| V5 | 0,539801 |
| V6 | 0,735814 |
| V7 | 0,21204 |
| V8 | 0,420683 |
| V9 | 0,592517 |

Jika diurutkan menghasilkan :

|  |  |  |
| --- | --- | --- |
| No |  | Hasil |
| 1 | V6 | 0,735814 |
| 2 | V9 | 0,592517 |
| 3 | V1 | 0,577126 |
| 4 | V2 | 0,539801 |
| 5 | V5 | 0,539801 |
| 6 | V4 | 0,501745 |
| 7 | V8 | 0,420683 |
| 8 | V3 | 0,347313 |
| 9 | V7 | 0,21204 |

Jika diurutkan sesuai nama menunya dan kandungan makanannya yaitu :

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Menu | C1 | C2 | C3 | C4 |
| Energi | Protein | Lemak | Karbo |
| 1 | Nasi Sup Makaroni Bola Ayam (2 Porsi) | 355 | 11 | 7 | 36 |
| 2 | Nasi Tumis Makaroni Sosis (3 Porsi) | 291 | 7 | 4 | 32 |
| 3 | Bubur Daging Tomat (1 Porsi) | 247 | 15 | 10 | 25 |
| 4 | Bubur Kentang Telur Keju (2 Porsi) | 246 | 10 | 16 | 17 |
| 5 | Bubur Kentang Telur Kornet (1 Porsi) | 246 | 10 | 16 | 17 |
| 6 | Bubur Keju Daging Kentang (2 Porsi) | 167 | 5 | 10 | 31 |
| 7 | Nasi Tumis Brokoli Sosis (2 Porsi) | 257 | 7 | 8 | 16 |
| 8 | Bubur Kentang Tahu (1 Porsi) | 144 | 6 | 3 | 25 |
| 9 | Nasi Sup Udang Tofu (2 Porsi) | 206 | 13 | 5 | 5 |