UJIAN AKHIR SEMESTER

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SOAL :

1. Buatlah implementasi program logika fuzzy?
2. Buatlah manual PDF dari program fuzzy nya?
   - Ketentuan jumlah variabel bebas, dan minimal 10 rule/aturan.

JAWABAN.

PERHITUNGAN SEBERAPA CEPAT BERKENDARA DENGAN METODE FUZZY

Kecepatan berkendara ini akan bergantung pada 2 variabel yaitu :

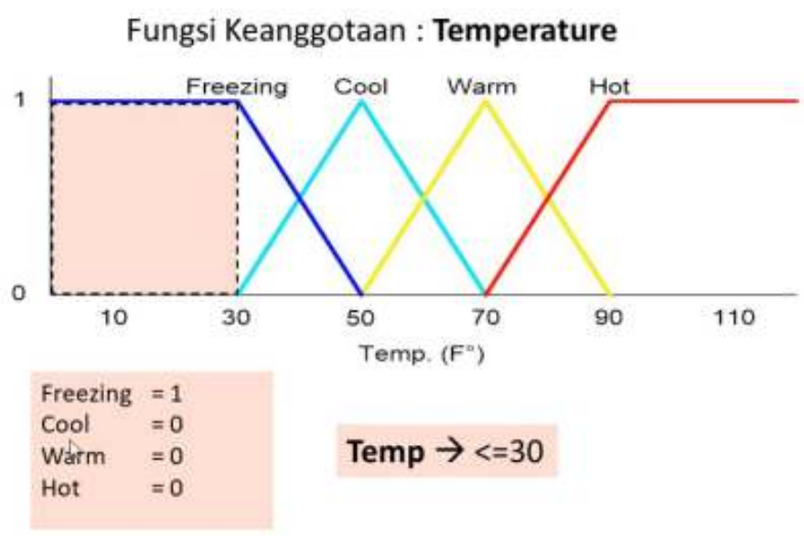
a. Temperature : temp F^o
b. Cloud Cover : cloud %

Ada beberapa langkah untuk menentukan kecepatan berkendara dengan metode fuzzy secara manual yaitu : mendefinisikan variabel, inferensi, dan defuzifikasi.

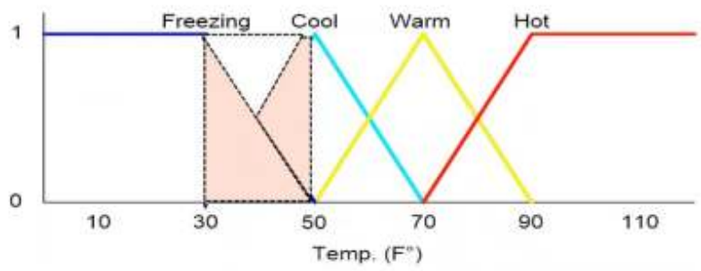
1. Mendefinisikan Variabel
   a. Variabel temp F^o

      Terdiri atas 4 himpunan fuzzy yaitu : freezing, cool, warm, hot

      - **frezzing**



- **freezing & cool**



$$\text{Freezing} = \frac{50 - \text{temp}}{50 - 30}$$

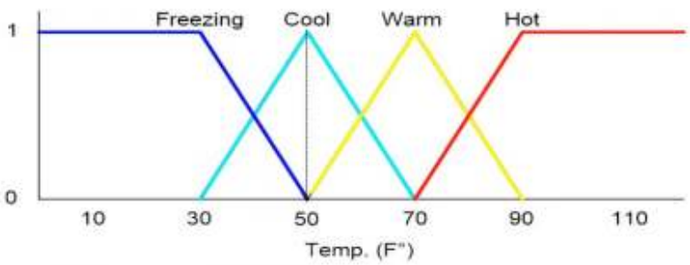
$$\text{Cool} = \frac{\text{temp} - 30}{50 - 30}$$

Warm = 0

Hot = 0

Temp → (> 30 dan <50)

- **cool**



Freezing = 0

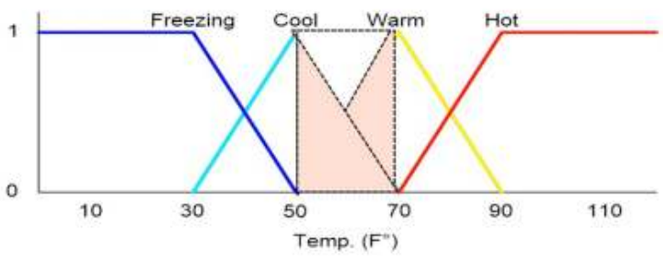
Cool = 1

Warm = 0

Hot = 0

Temp → = 50

- **cool and warm**



Freezing = 0

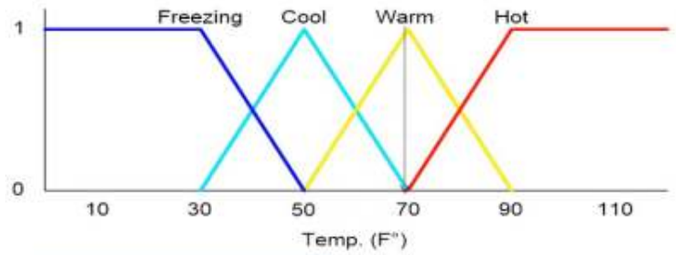
$$\text{Cool} = \frac{70 - \text{temp}}{70 - 50}$$

$$\text{Warm} = \frac{\text{temp} - 50}{70 - 50}$$

Hot = 0

Temp → (> 50 dan <70)

- **warm**

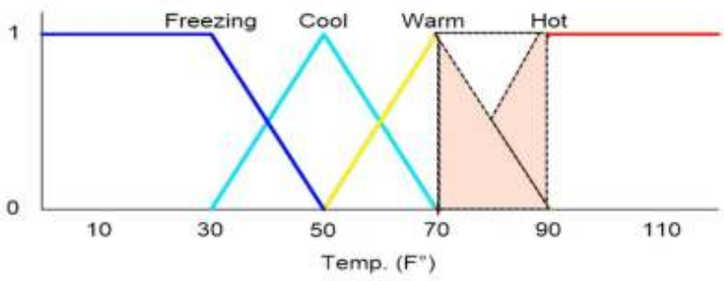


Freezing = 0

Cool = 0
Warm = 1
Hot = 0

Temp → = 70

- **warm & hot**

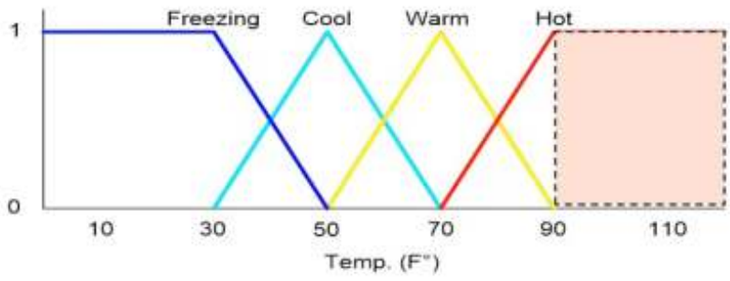


Freezing = 0
Cool = 0
Warm $= \frac{90 - temp}{90 - 70}$

Hot $= \frac{temp - 70}{90 - 70}$

Temp → (> 70 dan <90)

- **hot**



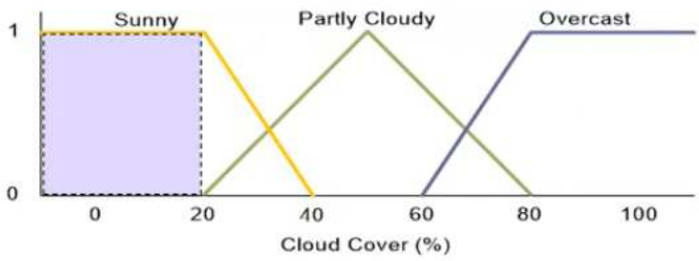
Freezing = 0
Cool = 0
Warm = 0
Hot = 1

Temp → >= 90

b. Variabel cloud %

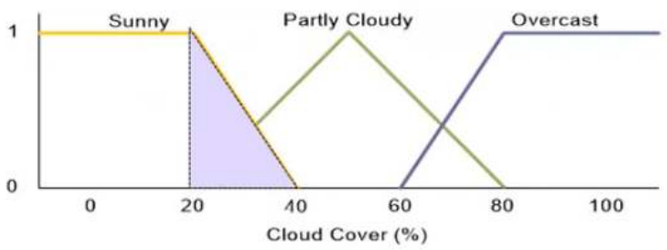
Terdiri atas 3 himpunan fuzzy yaitu : sunny, partly cloudly, overcast

- Sunny



Sunny = 1
Partly Cloudy = 0
Overcast = 0

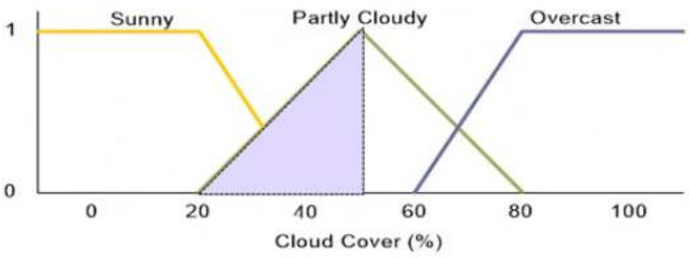
cloud → <=20



Sunny $= \frac{40 - cloud}{40 - 20}$
Overcast = 0

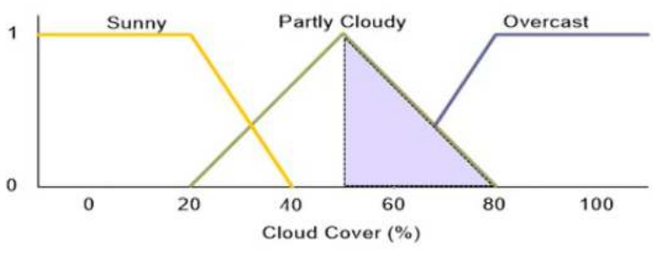
cloud → >20 dan <40

- Partly cloudy



Partly Cloudy $= \frac{cloud - 20}{50 - 20}$

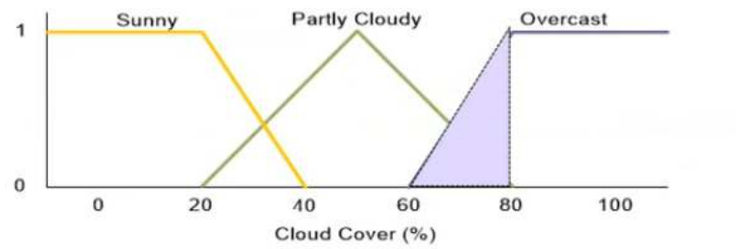
cloud → >20 dan <50



Sunny = 0
Partly Cloudy $= \frac{80 - cloud}{80 - 50}$

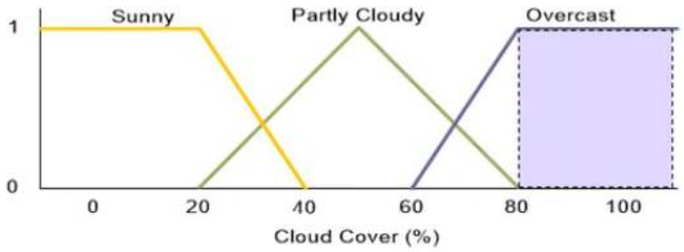
cloud → >50 dan <80

- Overcast



Sunny = 0
Overcast = $\frac{cloud - 60}{80 - 60}$

cloud → >60 dan <80



Sunny = 0
Partly Cloudy = 0
Overcast = 1

cloud → >= 80

2. Inverensi

   Dari uraian diatas terbentuk 7 himpunan fuzzy yaitu : temperature (freezing, cool, warm, hot), cloud cover (sunny, partly cloudy, overcast), maka diperoleh 12 rule atau aturan sbb :

Generate Aturan

Jumlah Aturan = Jumlah variabel Temperature x Jumlah variabel Cloud Cover
= 4 x 3 = **12**

No.	Aturan	No.	Aturan
1	If Freezing dan Sunny then Slow	**7**	**If Warm dan Sunny then Fast**
2	If Freezing dan Partly Cloudy then Slow	8	If Warm dan Partly Cloudy then Fast
3	If Freezing dan Overcast then Slow	9	If Warm dan Overcast then Fast
4	If Cool dan Sunny then Slow	10	If Hot dan Sunny then Fast
5	**If Cool dan Partly Cloudy then Slow**	11	If Hot dan Partly Cloudy then Fast
6	If Cool dan Overcast then Slow	12	If Hot dan Overcast then Fast

3. Defizifikasi

Defuzzifikasi

Speed = weighted mean
= (slow*25+ fast*75)/(slow + fast)
= **z** mph