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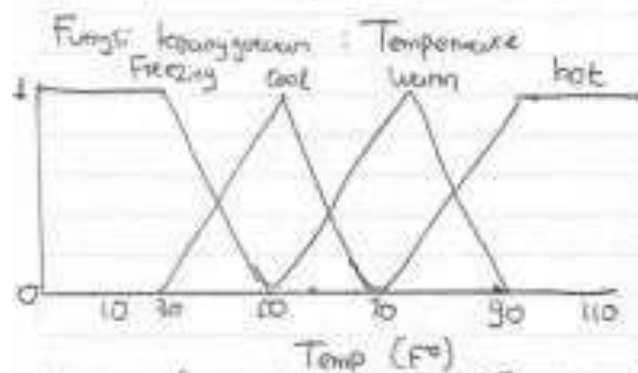
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PERHITUNGAN MANUAL LOGIKA FUZZY

Terdapat 2 Variabel yaitu temperatur dan Cloud

* Temperatur, Range 4 memiliki Linguistik yaitu Freezing, Cool, Warm, Hot

* Cloud : memiliki 3 nilai Linguistik yaitu Sunny, Partly cloudy, Overcast



① Temp (≤ 30)

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

② Temp (> 30 dan < 50)

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

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

Warm = 0
Hot = 0

③ Temp ($= 50$)

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

④ Temp (> 50 dan < 70)

Freezing = 0
Cool = $\frac{70 - \text{temp}}{70 - 50}$

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

Hot = 0

⑤ Temp ($= 70$)

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

⑥ Temp (> 70 dan < 90)

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

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

⑦ Temp (≥ 90)

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

Sistem Inferensi

$$\text{membran} \text{ aturan} \rightarrow \text{Jumlah aturan} = \sum \text{var temperature} \times \sum \text{var cloud cover} \\ = 4 \times 3 = 12$$

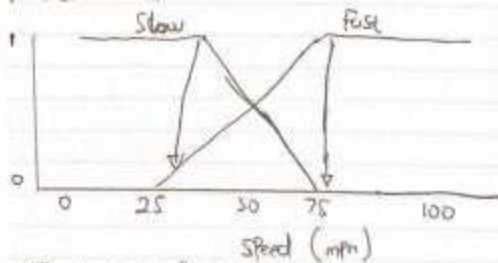
Rules

1. IF Freezing and Sunny then Slow
2. IF Freezing and Partly Cloudy then Slow
3. IF Freezing and overcast then Slow
4. IF Cool and Sunny then Slow
5. IF Cool and Partly Cloudy then Slow
6. IF Cool and Overcast then Slow
7. IF Warm and Sunny then Fast
8. IF Warm and Partly Cloudy then Fast
9. IF Warm and Overcast then Fast
10. IF Hot and Sunny then Fast
11. IF hot and Partly Cloudy then Fast
12. IF Hot and overcast then Fast

* Fungsi Peragukany memisah konjungsi → contoh: ← mengambil nilai minimum

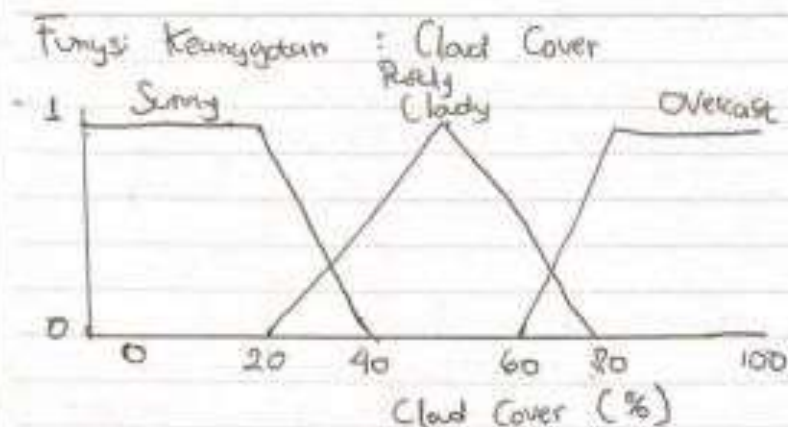
- 1) IF its Sunny and warm drive Fast
 $\text{Sunny (Cover)} \wedge \text{Warm (Temp)} \Rightarrow \text{Fast (Speed)}$
 $\text{Fast} = (\min(\text{Sunny (Cover)}, \text{Warm (Temp)}))$

Defuzzifikasi



Speed is 20% Slow
 and 80% Fast

$$\text{Speed} = \text{weighted mean} \\ = \frac{(\text{Slow} * 25 + \text{Fast} * 75)}{(\text{Slow} + \text{Fast})} \\ = 2 \text{ mph}$$



① Cloud (≤ 20)

$$\begin{aligned}\text{Sunny} &= 1 \\ \text{Partly cloudy} &= 0 \\ \text{Overcast} &= 0\end{aligned}$$

⑥ Cloud (> 60 dan < 80)

$$\begin{aligned}\text{Sunny} &= 0 \\ \text{Overcast} &= \frac{\text{Cloud} - 60}{80 - 60}\end{aligned}$$

② Cloud (> 20 dan < 40)

$$\text{Sunny} = \frac{40 - \text{Cloud}}{40 - 20}$$

$$\text{Overcast} = 0$$

⑦ Cloud (≥ 80)

$$\begin{aligned}\text{Sunny} &= 0 \\ \text{Partly cloudy} &= 0 \\ \text{Overcast} &= 1\end{aligned}$$

⑤ Cloud (> 20 dan < 50)

$$\text{Partly Cloudy} = \frac{\text{Cloud} - 20}{50 - 20}$$

④ Cloud (50)

$$\begin{aligned}\text{Sunny} &= 0 \\ \text{Partly cloudy} &= 1 \\ \text{Overcast} &= 0\end{aligned}$$

③ Cloud (> 50 dan < 80)

$$\begin{aligned}\text{Sunny} &= 0 \\ \text{Partly Cloudy} &= \frac{80 - \text{Cloud}}{80 - 50}\end{aligned}$$

Contoh Perhitungan manual
① Berapa kecepatan jika

• 65°F

• 55%

Jawab

• $65^{\circ}\text{F} \Rightarrow \text{Cool} = 0,25$ Warm = 0,75

• 55% \Rightarrow Partly Cloudy = 0,83

If Cool and Partly Cloudy then Slow [Rule ke 5]
 $0,25 \wedge 0,83 = 0,25 \rightarrow \text{Slow}$

If Warm and Partly Cloudy then Fast [Rule ke 8]
 $0,75 \wedge 0,83 = 0,75 \rightarrow \text{Fast}$

$$\text{Speed} = \frac{(\text{Slow} \times 25) + (\text{Fast} \times 75)}{\text{Slow} + \text{Fast}}$$

$$= \frac{(0,25 \times 25) + (0,75 \times 75)}{0,25 + 0,25}$$

$$= \frac{6,25 + 56,25}{1} = \underline{62,5} \text{ + Seem sesuai!!!}$$