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### Certainty Score for each Rule

- |                      |  |
|----------------------|--|
| • CF(hurting) = 1,0  | 1. IF hurt AND fever THEN infected = 0,6   |
| • CF(swollen) = 0,6  | 2. IF hurt AND swollen THEN trauma = 0,8   |
| • CF(red) = 0,1      | 3. IF overload THEN infected = 0,5         |
| • CF(fever) = 0,4    | 4. IF trauma AND red THEN broken = 0,8     |
| • CF(overload) = 1,0 | 5. IF trauma AND moves THEN sprained = 1,0 |
| • CF(moves) = 1,0    |  |

### Answer the Question

#### Rule 1 (IF hurt AND fever THEN infected)

1. CF(hurting) = 1,0
2. CF(fever) = 0,4
3. CF(IF hurt AND fever THEN infected) = 0,6

$$CF(A \text{ AND } B) = \min [CF(A), CF(B)]$$

$$CF(A \text{ OR } B) = \max [CF(A), CF(B)]$$

$$\begin{aligned} CF(\text{John's foot is infected}) &= \min[1, 0,4] \times 0,6 \text{ min karena penghubung 2 evidence dengan AND} \\ &= 0,4 \times 0,6 = 0,24 \end{aligned}$$

#### Rule 2 (IF hurt AND swollen THEN trauma)

1. CF(hurting) = 1,0
2. CF(swollen) = 0,6
3. CF(IF hurt AND swollen THEN trauma) = 0,8

$$CF(A \text{ AND } B) = \min [CF(A), CF(B)]$$

$$CF(A \text{ OR } B) = \max [CF(A), CF(B)]$$

$$\begin{aligned} CF(\text{John's foot is trauma}) &= \min[1, 0,6] \times 0,8 \text{ min karena penghubung 2 evidence dengan AND} \\ &= 0,6 \times 0,8 = 0,48 \end{aligned}$$

#### Rule 3 (IF overload THEN infected)

1.  $CF(\text{hurting}) = 1,0$
2.  $CF(\text{IF overload THEN infected}) = 0,5$

$$CF(\text{John's foot is infected}) = 1,0 \times 0,5 \\ = 0,5$$

**Rule 4 (IF trauma AND red THEN broken)**

1.  $CF(\text{trauma}) = 0,48 \rightarrow \text{from rule 2}$
4.  $CF(\text{red}) = 0,1$
5.  $CF(\text{IF trauma AND red THEN broken}) = 0,8$

$$CF(A \text{ AND } B) = \min[CF(A), CF(B)]$$

$$CF(A \text{ OR } B) = \max[CF(A), CF(B)]$$

$$CF(\text{John's foot is broken}) = \min[0,48, 0,1] \times 0,8 \text{ min karena penghubung 2 evidence dengan AND} \\ = 0,1 \times 0,8 = 0,08$$

**Rule 5 (IF trauma AND moves THEN sprained)**

1.  $CF(\text{trauma}) = 0,48 \rightarrow \text{from rule 2}$
2.  $CF(\text{moves}) = 1,0$
3.  $CF(\text{IF trauma AND moves THEN sprained}) = 1,0$

$$CF(A \text{ AND } B) = \min[CF(A), CF(B)]$$

$$CF(A \text{ OR } B) = \max[CF(A), CF(B)]$$

$$CF(\text{John's foot is sprained}) = \min[0,48, 1,0] \times 1,0 \text{ min karena penghubung 2 evidence dengan AND} \\ = 0,48 \times 1,0 = 0,48$$

**Statement (John's foot is infected) → dihitung kembali karena ada dua rule yang memiliki hipotesa yang sama (rule 1 dan rule 3)**

1.  $CF(\text{IF hurt AND fever THEN infected}) = 0,6 \rightarrow \text{rule 1}$
2.  $CF(\text{IF overload THEN infected}) = 0,5 \rightarrow \text{rule 3}$
3.  $CF_1(\text{John's foot is infected}) = 0,24 \rightarrow \text{from hasil CF dari rule 1}$
4.  $CF_2(\text{John's foot is infected}) = 0,5 \rightarrow \text{from hasil CF dari rule 3}$
5.  $CF(\text{John's foot is infected}) = CF_1(Q) + CF_2(Q) - CF_1(Q) \times CF_2(Q) \text{ cause both values is positive}$   

$$= 0,24 + 0,5 - 0,24 \times 0,5$$

$$= 0,24 + 0,5 - 0,12$$

$$= 0,74 - 0,12$$

$$= 0,62$$

## Conclusion

Hasil Perhitungan CF 3 hipotesa pada pertanyaan (broken, sprained and infected)

John's foot is broken = 0,08

John's foot is sprained = 0,48

John's foot is infected = 0,62

And the result is

Karena score *certainty factor* tertinggi didapatkan pada rule *John;s foot is infected* dengan hasil perhitungan *certainty factor* 0,62 maka dapat disimpulkan bahwa pada saat ini kaki John sedang mengalami infeksi (*John's foot is infected*).