**Roll no:- 10317 / 10308**

**Practical No: 4 Fuzzy  Logic**

**What is Fuzzy Logic?**

The ’Fuzz’ word means the things that are not clear or  are vague. Sometimes, we cannot decide in real life that  the given problem or statement is either true or false.  At that time, this concept provides many values  between the true and false and gives the flexibility to  find the best solution to that problem.

**Example of Fuzzy Logic as  comparing to Boolean Logic**

**A diagram of a diagram

Description automatically generated with medium confidence**

▪Fuzzy logic contains the multiple logical values and these values are the truth  values of a variable or problem between 0 and 1.

▪In the Boolean system, only two possibilities (0 and 1) exist, where 1 denotes  the absolute truth value and 0 denotes the absolute false value. But in the  fuzzy system, there are multiple possibilities present between the 0 and 1,  which are partially false and partially true.

▪Fuzzy logic is based on natural language processing.

**Components Of Fuzzy Logic**

**1.Fuzzy Rule Base & Inference System**

•Uses **IF-THEN** rules

•**Example:**

• IF temperature is HIGH THEN fan speed is FAST

**2.Fuzzification & Membership Functions**

•Converts crisp inputs into fuzzy values

•**Example:** Temperature = 35°C → Medium (0.6), High (0.4) **3. Defuzzification**

•Converts fuzzy output to crisp values

•Methods: Centroid, Mean of Maximum, Weighted Average

**Applications of Fuzzy Logic**

**i. Industrial Control Systems** (Washing Machines, ACs) **ii. Artificial Intelligence & Robotics**

**iii. Medical Diagnosis & Expert Systems**

**iv. Stock Market Prediction**

**v. Automobile Industry (ABS, Gear Shift Control)**

**Code:-  
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**A screenshot of a computer program

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