

Unit 3 - Week 1

Course outline
How does an NPTEL online course work?
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Week 1
<ul style="list-style-type: none"> Lecture 1 : Introduction to Soft Computing Lecture 2: Introduction to Fuzzy Logic Lecture 3: Fuzzy membership functions (Contd.) and Defining Membership functions Lecture 4: Fuzzy operations Lecture 5: Fuzzy relations Lecture material of Week 1
<ul style="list-style-type: none"> Quiz : Week 1 Assignment 1 Week 1 Feedback Form
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Week 1 Assignment 1

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-02-12, 23:59 IST.

- 1) In the following, some statements are given. 1 point
- A fuzzy set is a crisp set but the reverse is not true.
 - If A, B and C are three fuzzy sets defined over the same universe of discourse, say X, such that $A \leq B$ and $B \leq C$, then $A \leq C$.
 - Membership function defines the fuzziness in a fuzzy set irrespective of the elements in the set, which are discrete or continuous.
- Choose the correct statement(s) from the statements given above.
- i only
 - ii only
 - Both ii and iii
 - All i, ii and iii
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: c.
- 2) A fuzzy set A is closed: 1 point
- If $\lim_{x \rightarrow -\infty} \mu_A(x) = 1$ and $\lim_{x \rightarrow +\infty} \mu_A(x) = 0$
 - If $\lim_{x \rightarrow -\infty} \mu_A(x) = \lim_{x \rightarrow +\infty} \mu_A(x) = 0$
 - If $\lim_{x \rightarrow -\infty} \mu_A(x) = 0$ and $\lim_{x \rightarrow +\infty} \mu_A(x) = 1$
 - If $\lim_{x \rightarrow -\infty} \mu_A(x) = \lim_{x \rightarrow +\infty} \mu_A(x) = 1$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: b.
- 3) A Fuzzy singleton is a single point x in X, such that 1 point
- $\mu_A(x) > 0$ and $|A| > 0$
 - $\mu_A(x) = 1$ and $|A| = 1$
 - $\mu_A(x) = 0.5$
 - $\mu_A(x) \neq 1$ and $|A| \neq 1$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: b.
- 4) An equivalence between Fuzzy vs. Probability to that of Prediction vs. Forecasting is 1 point
- Fuzzy \approx Prediction
 - Fuzzy \approx Forecasting
 - Probability \approx Forecasting
 - None of the above
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: b.
- 5) Both fuzzy logic and artificial neural network are soft computing techniques because 1 point
- Both give precise and accurate results.
 - Artificial neural network gives accurate result, but fuzzy logic does not.
 - In each, no precise mathematical model of the problem is required.
 - Fuzzy gives exact result but artificial neural network does not.
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: c.
- 6) Consider two fuzzy sets A and B with their membership functions μ_A and μ_B . Then De Morgan's law can be defined as 1 point
- $(A \cup B)^c = A^c \cup B^c$
 - $(A \cup B)^c = A^c \cap B^c$
 - $(A \cup B)^c = A^c \cup B$
 - $(A \cup B)^c = A \cap B^c$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: b.
- 7) Which one of the following is an example of Gaussian Membership function? 1 point
- $\mu(x; c, \sigma) = e^{-\frac{(x-c)^2}{2\sigma^2}}$
 - $\mu(x; a, c) = \frac{1}{1+e^{-[a(x-c)]}}$
 - $\mu(x; a, b, c) = \frac{1}{1+|\frac{x-c}{a}|^b}$
 - $\mu(x; a, b, c) = \begin{cases} 0 & x \leq a \\ \frac{x-a}{b-a} & a \leq x \leq b \\ \frac{c-x}{c-b} & b \leq x \leq c \\ 0 & c \leq x \end{cases}$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: a.
- 8) How is Fuzzy Logic different from conventional control methods? 1 point
- IF and THEN Approach
 - FOR Approach
 - WHILE Approach
 - DO Approach
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: a.
- 9) The height h(A) of a fuzzy set A is defined as $h(A) = \text{support } A(x)$, where x belongs to A. Then the fuzzy set A is called normal when 1 point
- $h(A)=0$
 - $h(A)<0$
 - $h(A)=1$
 - $h(A)>1$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: c.
- 10) Fuzzy logic is a form of 1 point
- Two-valued logic
 - Crisp set logic
 - Many-valued logic
 - Binary set logic
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: c.
- 11) For $k < 1$, which of the following concept can be used to generate other linguistic hedge? 1 point
- Both concentration and dilation
 - Dilation only
 - Concentration only
 - None of the above
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: b.
- 12) Given two fuzzy set A and B 1 point
- $A = \{(x1, 0.5), (x2, 0.1), (x3, 0.4)\}$ and $B = \{(x1, 0.2), (x2, 0.3), (x3, 0.5)\}$
- Then intersection of the two set i.e. $A \cap B$ is given by
- $\{(x1, 0.5), (x2, 0.1), (x3, 0.4)\}$
 - $\{(x1, 0.2), (x2, 0.3), (x3, 0.5)\}$
 - $\{(x1, 0.2), (x2, 0.3), (x3, 0.5)\}$
 - $\{(x1, 0.2), (x2, 0.1), (x3, 0.4)\}$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: d.
- 13) Given two Fuzzy Sets A and B with MFs μ_A and μ_B , respectively. Bounded difference is given by: 1 point
- $\mu_A(x) \cdot \mu_B(x)$
 - $\mu_A(x) + \mu_B(x) - \mu_A(x) \cdot \mu_B(x)$
 - $\min\{1, \mu_A(x) + \mu_B(x)\}$
 - $\max\{0, \mu_A(x) + \mu_B(x) - 1\}$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: d.
- 14) Two fuzzy sets A and B with membership functions $\mu_A(x)$ and $\mu_B(x)$, respectively defined as below. 1 point
- A = Hot Climate with $\mu_A(x)$ as the MF.
B = Cold Climate with $\mu_B(x)$ as the MF.
- Then pleasant climate is given by:
- $1 - \mu_B(x)$
 - $\max(\mu_A(x), \mu_B(x))$
 - $\min(\mu_A(x), \mu_B(x))$
 - $1 - \mu_A(x)$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: c.
- 15) Which membership function is called "Cauchy MF"? 1 point
- Gaussian MF
 - Sigmoidal MF
 - Generalized bell MF
 - Trapezoidal MF
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers: c.