

Unit 4 - Week 2 :

Course outline

How does an NPTEL online course work?

Week 0

Week 1 :

Week 2 :

- Lecture 7 : Applications of Fuzzy Sets
- Lecture 8 : Applications of Fuzzy Sets (Contd.)
- Lecture 9 : Applications of Fuzzy Sets (Contd.)
- Lecture 10 : Applications of Fuzzy Sets (Contd.)
- Lecture 11 : Applications of Fuzzy Sets (Contd.)
- Lecture Material
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Assignment Detailed Solution

Assignment 2

The due date for submitting this assignment has passed. **Due on 2020-03-11, 23:59 IST.**
 As per our records you have not submitted this assignment.

1) Precise fuzzy modeling (Takagi and Sugeno's Approach) is characterized by 2 points

a. High interpretability and high accuracy
 b. Low interpretability and low accuracy
 c. High interpretability but low accuracy
 d. Low interpretability but high accuracy

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: d.

2) In Mamdani approach of fuzzy reasoning tool, the strength of a fired rule is determined using 2 points

a. OR operator
 b. AND operator
 c. UNION operator
 d. Multiplication operator

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: b.

3) The performance of a fuzzy logic controller depends on its 2 points

a. Data base only
 b. Rule base only
 c. Both data base as well as rule base
 d. Neither data base nor rule base

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: c.

4) The concept of fuzzy sets can be used in 2 points

a. Fuzzy reasoning tool only
 b. Clustering only
 c. Both fuzzy reasoning tool as well as clustering
 d. Neither fuzzy reasoning tool nor clustering

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: c.

5) In Mamdani approach of fuzzy reasoning tool, let us assume that two rules are getting fired for a set of inputs. The combined fuzzified output considering these two fired rules is found to be as shown in Fig. A. The membership function distributions are assumed to be Gaussian (G) with different mean and standard deviation values. 2 points

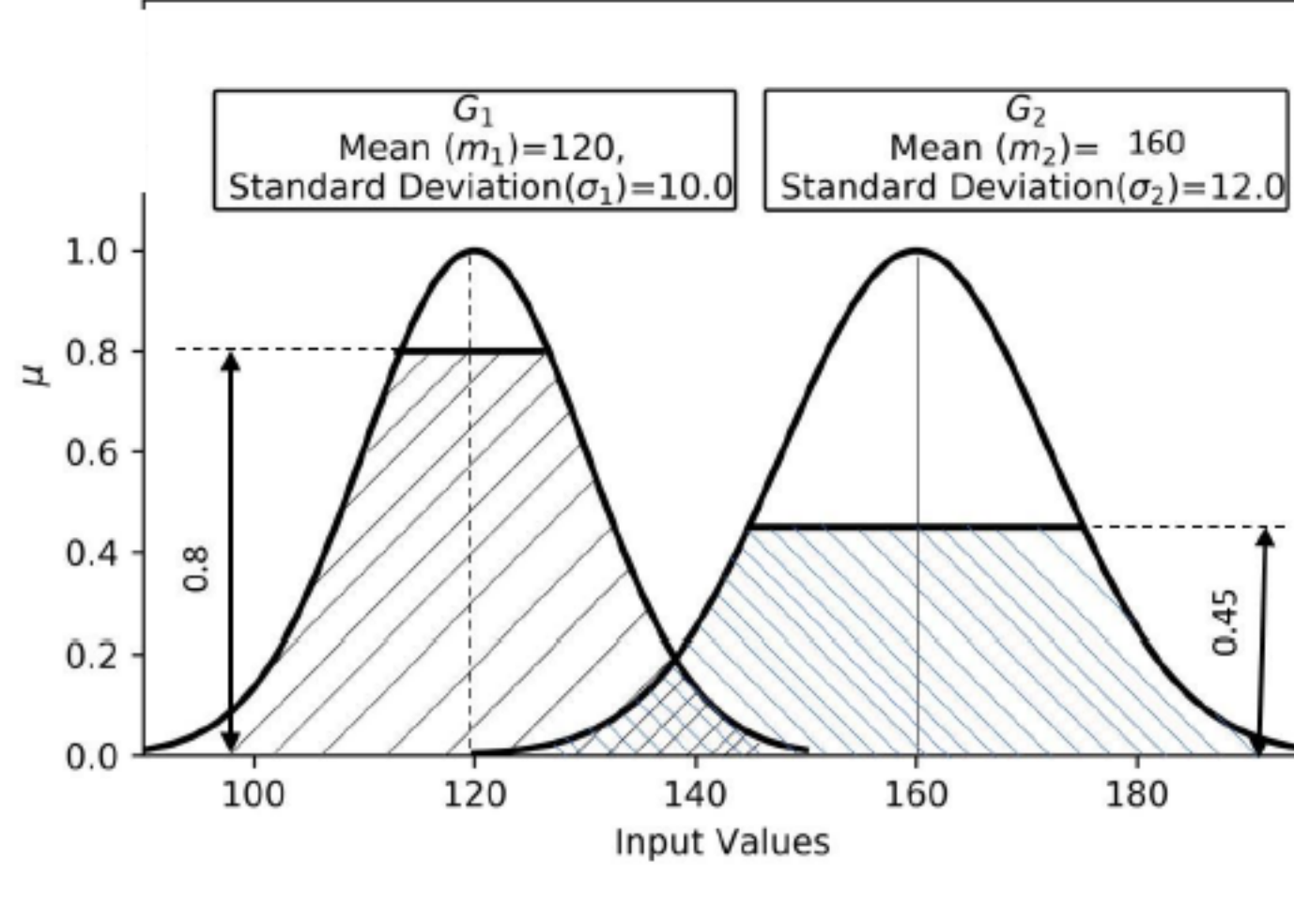


Fig. A: Combined fuzzified output considering two fired rules.

By using the Mean of Maxima method, the crisp output is found to be equal to

a. 120
 b. 160
 c. 140
 d. 180

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a.

6) Which one of the following statements is TRUE for a fuzzy reasoning tool? 2 points

a. Its inputs are to be represented in normalized scale of (0.0, 1.0) only.
 b. Its inputs are to be represented in normalized scale of (-1.0, +1.0) only.
 c. Its inputs are to be represented in real scales only.
 d. Its inputs can be represented in either real scales or normalized scales.

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: d.

7) Fuzzy reasoning tool aims to 2 points

a. obtain the clusters of the data points based on their similarity values.
 b. map the higher dimensional data into the lower dimension(s) for the purpose of visualization.
 c. determine the input-output relationships of the data set.
 d. remove the noisy data from a data set.

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: c.

8) Which one of the following statements is TRUE? 2 points

a. Takagi and Sugeno's approach can provide more accuracy compared to Mamdani approach.
 b. Mamdani approach can provide more accuracy compared to Takagi and Sugeno's approach.
 c. Both Mamdani approach as well as Takagi and Sugeno's approach can provide the same level of accuracy.
 d. Accuracy of Mamdani approach is not comparable to that of Takagi and Sugeno's approach.

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a.

9) In Mamdani approach of fuzzy reasoning tool, let us consider that two rules are going to be fired for a set of inputs. The fuzzified outputs of two fired rules are shown in Figs. B and C. 2 points

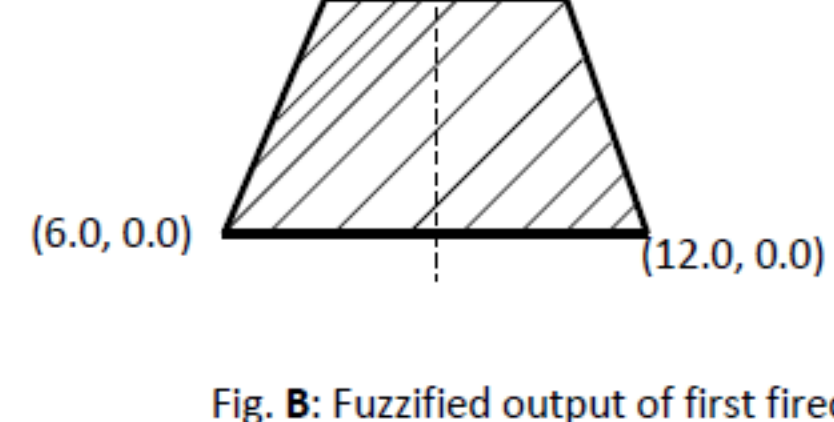


Fig. B: Fuzzified output of first fired rule.

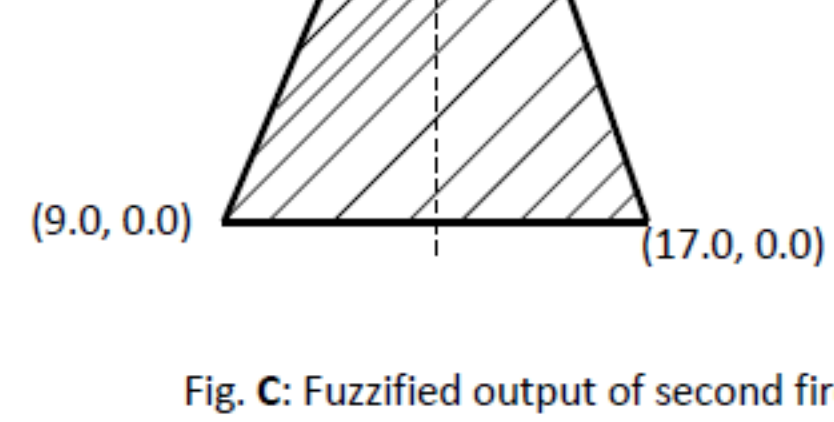


Fig. C: Fuzzified output of second fired rule.

By using the Center of Sums method, the crisp output is found to be equal to

a. 10.67
 b. 9.80
 c. 11.22
 d. 16.28

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: c.

10) Centroid method of defuzzification is used in 2 points

a. Takagi and Sugeno's approach of fuzzy reasoning tool only.
 b. Mamdani approach of fuzzy reasoning tool only.
 c. neither Takagi and Sugeno's approach nor Mamdani approach of fuzzy reasoning tool.
 d. both Mamdani approach as well as Takagi and Sugeno's approach of fuzzy reasoning tool

a.
 b.
 c.
 d.

No, the answer is incorrect.
 Score: 0
 Accepted Answers: b.