MCQ Test

1. If 'Z' is a uniform random variable distributed over [0, 10], calculate the probability that 'Z' < 3 (2 points)
   a) 1/10
   b) 2/10
   c) 3/10
   d) 4/10

2. Which of the following is an invalid identifier? (2 points)
   a) My_str_1
   b) 1st_str
   c) Foo
   d) __

3. Which of the following vectors are orthogonal: (Choose all the correct options) (3 points)
   a) a = (6,2,-1), b = (2,-7,-2)
   b) a = (5,2,-2), b = (2,-7,-2)
   c) a = (4,-8), b = (-4,-2)
   d) a = (1,2,-1), b = (2,-3,-2)

4. Calculate the dot product and angle between c = (−8, −6) and d = (−4, 5)? (2 points)
   a) dot product = -2, acute angle
   b) dot product = 2, obtuse angle
   c) dot product = 2, acute angle
   d) dot product = -2, obtuse angle

5. In Domino's, an average of 3 out of 5 customers ask for ketchup with their Pizza. Assume a random sample of 10 customers is selected. Find the probability that exactly 6 customers ask for ketchup with their Pizza. (2 points)
   a) 0.20
   b) 0.35
   c) 0.30
   d) 0.25

6. In Python, which of the following is invalid statement? (2 points)
   a) Abc = 100,000,000
   b) A,b,c = 100,200,300
   c) A b c = 100 200 300
   d) A_b_c = 100,000,000

7. What are the differences of using squared difference over absolute difference for variance? (Choose all the correct options) (3 points)

a) Square function is continuous and differentiable everywhere.
b) Square retains the arithmetic signs after computing.
c) Square removes the effects of outliers in the data.
d) Square magnifies the outliers in the data.

8. There are 52 cards in a deck (not including Jokers). find out probability of getting an even number on card given that card is of red colour. (Note: - only assume Numbered cards i.e., 2 to 10.) (2 points)

a) 5/52
b) 10/26
c) 6/52
d) 5/26

9. Given the dataset below. Let's say the goal is to predict the food review based on its smell, taste and portion size. Let's assume that you want to create a Decision Tree Model. What is the information gain with respect to 'Taste' i.e. Compute Information_Gain(Review, Taste)? (5 points)

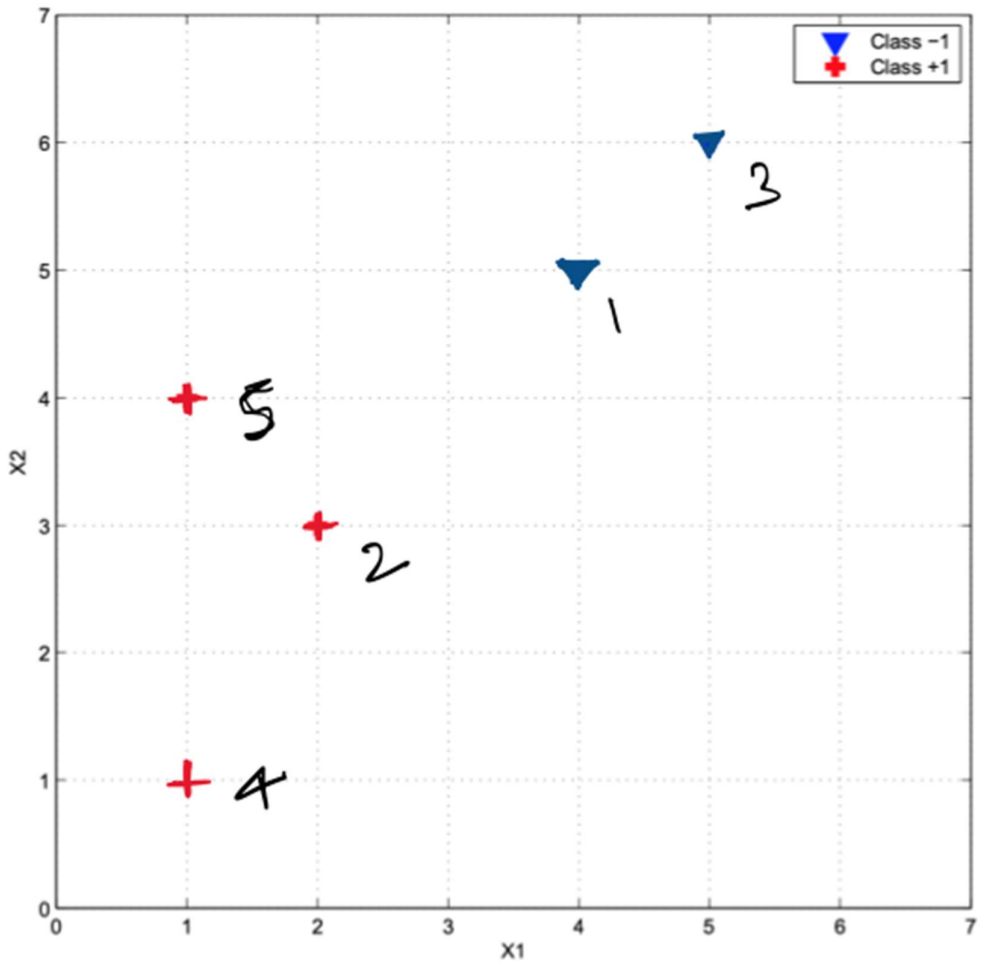
Review	Smell	Taste	Portion
Negative	Woody	Sweet	Small
Negative	Fruity	Salty	Large
Negative	Fruity	Salty	Large
Positive	Fruity	Sour	Small
Positive	Woody	Sour	Small
Negative	Woody	Sweet	Large
Positive	Woody	Sour	Large
Positive	Fruity	Salty	Small
Positive	Fruity	Salty	Small
Negative	Woody	Sweet	Large

a) 0.5
b) 1
c) 0
d) 0.6

10. In Python, what is the maximum possible length of an identifier? (2 points)

a) 63 Character
b) 31 Character
c) 79 Character
d) None of the above

11. Select the support vectors in the figure below when training an SVM. There are two classes and each sample is marked with an id. (5 points)



a) 2,5,1,3
b) 1,2
c) 4,3
d) 1,2,5

Hackathon

Perform below mentioned steps in the Jupyter Notebook and submit.

Data: innomatics_test.csv

Task:
Step 1: Download the dataset from the link available above.
Step 2: Perform proper analysis of the dataset and draw conclusions based on your analysis.
Step 3: Build a Machine Learning Model to predict output based on the input column.

Step 4: **Bonus (max weightage) Make sure to apply:

- Proper outlier detection and treatment.
- Feature Engineering
- Hyperparameter Tuning

Step 5: Use appropriate evaluation metrics and compare all the models and write your observations i.e., why is one model better than the other?

Step 6: **Bonus (max weightage) Build a Linear Regression model by performing appropriate feature engineering.

Step 7: Zip your jupyter notebook and upload it on the Link.