

# MALIS

## Group Exercise

October 18 2022

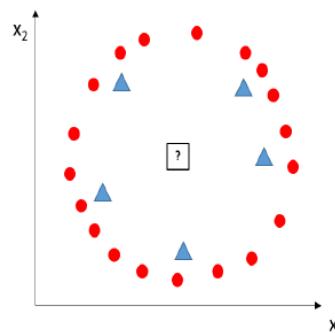
<b>Group Name:</b>	
<b>Group Members:</b>	

### Probability Refresher

1. True/False For a continuous random variable  $x$  and its probability density function  $p(x)$ , it holds that  $0 \leq p(x) \leq 1$  for all  $x$ . Justify your answer

### Bayes Classifier

2. Consider the figure below. Suppose you train a Bayes classifier using the triangles and circles as training data. What class will be predicted for the testing point (?) in the figure? Justify your answer.



### Logistic Regression

3. Suppose you train a logistic regression classifier of the form  $\hat{y} = h(\mathbf{x}) = \sigma(w_0 + \mathbf{w}^T \mathbf{x})$ , where  $\sigma(\cdot)$  is the sigmoid function and  $\mathbf{x} \in \mathbb{R}^2$ . You obtain the following model parameters:  $w_0 = 3$ ,  $\mathbf{w} = [0; -1]^T$ . Plot the decision boundary of this classifier showing the regions where  $y = 0$  and  $y = 1$ .