

# Quiz break

Q1-1: K-NN algorithms can be used for:

- A Only classification
- B Only regression
- C Both

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Q1-2: Which of the following distance measure do we use in case categorical variables in k-NN?

- A Hamming distance
- B Euclidean distance
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Q1-3: Consider binary classification in 2D where the intended label of a point  $x = (x_1, x_2)$  is positive if  $x_1 > x_2$  and negative otherwise. Let the training set be all points of the form  $x = [4a, 3b]$  where  $a, b$  are integers. Each training item has the correct label that follows the rule above. With a 1NN classifier (Euclidean distance), which ones of the following points are labeled positive? Multiple answers.

- $[5.52, 2.41]$
- $[8.47, 5.84]$
- $[7, 8.17]$
- $[6.7, 8.88]$

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- $[5.52, 2.41]$
- $[8.47, 5.84]$
- $[7, 8.17]$
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Nearest neighbors are  
 $[4, 3] \Rightarrow$  positive  
 $[8, 6] \Rightarrow$  positive  
 $[8, 9] \Rightarrow$  negative  
 $[8, 9] \Rightarrow$  negative  
Individually.

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Q2-2: True or False

Maximum likelihood estimation is the same regardless of whether we maximize the likelihood or log-likelihood function.

- A True
- B False

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- A True
- B False



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Q2-3: Suppose the weights of randomly selected American female college students are normally distributed with unknown mean  $\mu$  and standard deviation  $\sigma$ . A random sample of 10 American female college students yielded the following weights in pounds: 115 122 130 127 149 160 152 138 149 180. Find a maximum likelihood estimate of  $\mu$ .

- A 132.2
- B 142.2
- C 152.2
- D 162.2

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