**Assignment-1**

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Text

Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

Text

Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

Graphical user interface, text, application, email

Description automatically generated

A screenshot of a computer

Description automatically generated

Text

Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

Text

Description automatically generated

A screenshot of a computer

Description automatically generated

Graphical user interface, text, application

Description automatically generated

A screenshot of a computer

Description automatically generated

A picture containing graphical user interface

Description automatically generated

A screenshot of a computer

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

Graphical user interface, text

Description automatically generated

A screenshot of a computer

Description automatically generated

Chart, scatter chart, box and whisker chart

Description automatically generated

1. As mentioned, dividing the data into two equal parts. We will get the below

First part i.e., Training data contains points of dot class (1,2) and cross class (3, 6)

Second part i.e., Testing data contains points of dot class (7,10, 11) and cross class (6)

Considering the KNN with K = 3.

1. for point 6 of testing data, we can see that the 3 nearest neighbors are at (6,3, 2) of training data, out of which 6 and 3 are of cross. Hence, we will label 6 of testing data as a cross which indeed is a cross. Hence, it is the **correct**classification.

2. for point 7 of testing data, we can see that the 3 nearest neighbors are at (6,3, 2) of training data, out of which 6 and 3 are of cross. Hence, we will label 7 of testing data as a cross which is a dot. Hence, it is the **incorrect**classification.

3. for point 10 of testing data, we can see that the 3 nearest neighbors are at (6,3, 2) of training data, out of which 6 and 3 are of cross. Hence, we will label 10 of testing data as a cross which is a dot. Hence, it is the **incorrect**classification.

4. for point 11 of testing data, we can see that the 3 nearest neighbors are at (6,3, 2) of training data, out of which 6 and 3 are of cross. Hence, we will label 11 of testing data as a cross which is a dot. Hence, it is the **incorrect**classification.

True Positive (TP) = 25%

False Positive (FP) = 75%

True Negative (TN) = 25%

False Negative (FN) = 75%

• **Accuracy** = (TP+TN)/(P+N) = 50/200 = 0.25

• **Sensitivity or true positive rate (TPR)**

TP/(TP+FN) = TP/P = 25/100 = 0.25

• **Specificity or TNR**

TN/(FP+TN) = TN/N = 25/100 = 0.25