

1. (3 points) Which of the following option is true about k -NN algorithm?
 - (a) It can be used for classification.
 - (b) It can be used for regression.
 - (c) It can be used in both classification and regression.
 - (d) None of the above
2. (3 points) Which of the following statement is true about k -NN algorithm?
 - (a) k -NN performs much better if all of the data have the same scale.
 - (b) k -NN works well with a small number of input variables, but struggles when the number of inputs is very large.
 - (c) k -NN makes no assumptions about the distribution of the data.
 - (d) All of the above.
 - (e) None of the above.
3. Suppose, you have given the following data where x and y are the 2 input variables and Class is the dependent variable.

x	y	Class
-1	1	1.1
0	1	1.7
0	2	2.4
1	-1	1.2
1	0	1.9
1	2	3.0
2	2	3.1
2	3	3.2

- (a) (4 points) Consider the point $A = (0,0)$. Using the two-nearest neighbors, what is the predicted value for Class of the point A?
 - (b) (4 points) Consider the point $B = (3,3)$. Using the three-nearest neighbors, what is the predicted value for Class of the point B?
4. Consider the point $A = (1, 3, 5, 7, 13)$. **In Python**, answer the following:
 - (a) (3 points) Rescale the point A using the 0-1 transformation.
 - (b) (3 points) Rescale the point A using the z -score standardization.