Chapter 7

If predictors are very different in scales, should we standardize predictors before running kNN?

> Yes

Consider a kNN model with k=7. For a new observation, there are 5 nearest neighbors in class 1 and 2 nearest neighbors in class 0. With a cutoff = 0.75, which class should we assign this observation to?

> Class 0. C_1 = 5, C_0 = 2. C_1 = (5/7 = 0.71). C_2 =(2/7 = 0.28). Y=0 -> (p (0.71) < cutoff(0.75)) ---> Class 0

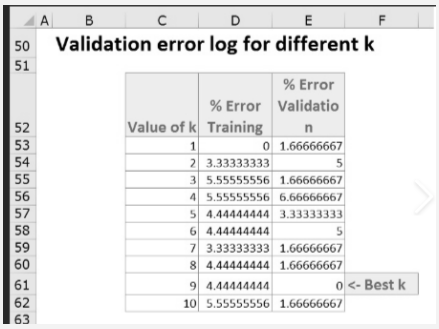
Which of the following weights are reasonable for kNN of prediction? Denote by di the distance of the i-th nearest neighbor.

> (1/di) / (1/d1 + 1/d2 +... + 1/dk)

Consider the same 2-class classification problem and use the same output table as in the previous question. Which value for k is most appropriate?

> 3

Validation Error with Different K Values

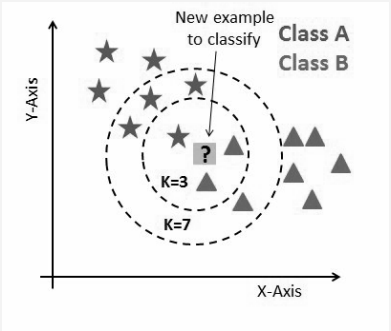


Validation error log for different k

Value of k	% Error Training	% Error Validation	
1	0	1.66666667	
2	3.33333333	5	
3	5.55555556	1.66666667	
4	5.55555556	6.66666667	
5	4.44444444	3.33333333	
6	4.44444444	5	
7	3.33333333	1.66666667	
8	4.44444444	1.66666667	
9	4.44444444	0	<- Best k
10	5.55555556	1.66666667	

Continuous: You and XLMiners will pick the LOWEST one.
Binary: Pick the lowest non-even K

Probabilitiy new observation belongs to class A



In kNN with k = 3, what is the probability that the new observation belongs to class A?

Class A: C_0: 1

Class B: C_1: 2

K = 1/3 ---> # in class A over K = #

Chapter 9

For continous variable with 100 unique values, how many possible partitions are there along that variable in the recursive partitioning

> 99

Suppose we are studying a 4-class classification problem with classification tree. What is the maximum value of entropy measure of impurity?

> 2 ---> $\log_2(4) = 2$

How many possible partitions can we have for a categorical predictor with 4 categories? (Hint: you can enumerate them)

> 7 --> abcd, a-bcd, b-acd, c-dab, d-abc, ab-cd, ac-bd, ad-ac

Is a full tree over fitted

> Yes

Which tree is smaller, minimum error tree or best pruned tree ? Suppose they are different (sometimes they can be the same tree)

> Best Pruned Tree

Chapter 9 (cont)

How do we measure the impurity of a partition in regression tree?

> Sum of Squared Deviations

Is CART a model free algorithm

> Yes

chapter 10

For a logistic regression mode estimated as below, what is the probability of accepting personal loan offer for a person with income of 50K dollars (X= 50)?

> 1.22% i think. use the regression equation and sub in for x. =(1/(1+(EXP(-6.3525-0.0392*(50))))) = probability

Using the cutoff of 10%, should this person be classified as who will accept the offer?

> Yes

What are the Odds of accepting the loan offer for this person?

> 0.0124 --> p/ (1-P) = the odds

What is the odds ratio of income?

> 1.03998

Is logistic regression a model- free algorithm

> NO