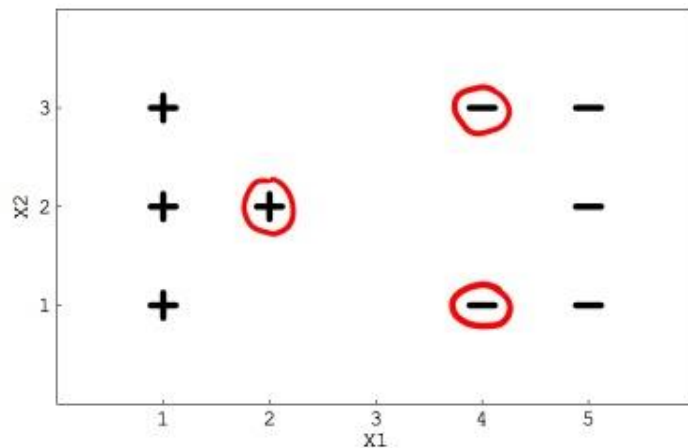


Exercises Sheet #4

Exercise 1 (SVM Quiz)

Suppose you are using a Linear SVM classifier with 2 class classification problem. Now you have been given the following data in which some points are circled that represent support vectors.



Q1. *If you remove anyone of the circled points from the data. Will the decision boundary change?*

- A) Yes
- B) No

Q2. *[True or False] If you remove the non-circled points from the data, the decision boundary will change?*

- A) True
- B) False

Q3. *What do you mean by generalization error in terms of the SVM?*

- A) How far the hyperplane is from the support vectors
- B) How accurately the SVM can predict outcomes for unseen data
- C) The threshold amount of error in an SVM

Q4. *When the C parameter is set to infinite, which of the following holds true?*

- A) The optimal hyperplane, if exists, will be the one that completely separates the data
- B) The soft-margin classifier will separate the data
- C) None of the above

Q5. *What do you mean by a hard margin?*

- A) The SVM allows a very low error in classification
- B) The SVM allows a high amount of error in the classification
- C) None of the above

Q6. *The effectiveness of an SVM depends upon _____.*

- A) Selection of Kernel trick
- B) Kernel Parameters
- C) Soft Margin Parameter C
- D) All of the above

Q7. *Support vectors are the data points that lie closest to the decision surface.*

- A) TRUE
- B) FALSE

Q8. *What is/are true about kernel in SVM?*

- 1. Kernel function map low dimensional input data to high dimensional space
- 2. It's a similarity function

- A) 1
- B) 2
- C) 1 and 2
- D) None of these

Exercise 2 (Ensemble Learning Quiz)

Q1. *What is an ensemble learning model?*

- A. A model that uses a single algorithm to make predictions
- B. A model that combines the predictions of multiple base models to make a final prediction
- C. A model that uses unsupervised learning to make predictions
- D. A model that uses reinforcement learning to make predictions

Q2. *What is bagging in ensemble learning?*

- A. Training multiple base models on the same data and features
- B. Training multiple base models on different subsets of the data and features
- C. Training multiple base models on different subsets of the data and using a weighted average to combine their predictions
- D. Training a meta-model to combine the predictions of multiple base models

Q3. *What is bagging?*

- A. A method for creating multiple datasets by sampling with replacement
- B. A method for reducing the number of features used in a model
- C. A method for adjusting the weights of different models in an ensemble
- D. A method for combining the predictions of different models in an ensemble

Q4. *What is boosting?*

- A. A method for sequentially adding models to an ensemble and adjusting their weights based on the error of the previous models
- B. A method for randomly selecting subsets of features to reduce model complexity
- C. A method for randomly selecting subsets of data to reduce model variance
- D. A method for speeding up model training by parallelizing computation

Q5. Which of the following is NOT a type of ensemble learning?

- A. Bagging
- B. Boosting
- C. Stacking
- D. Random sampling

Q6. Which of the following is/are correct regarding benefits of ensemble model?

- A. Better performance
- B. Generalized models
- C. Better interpretability

- 1. A, C
- 2. B, C
- 3. A, B
- 4. A, B, C

Q7. Which of the following statement(s) is/are correct about Bagging?

- A. In bagging, we choose random subsamples of the input points with replacement
- B. The main purpose of bagging is to decrease the bias of learning algorithms.
- C. Bagging is ineffective with logistic regression, because all of the learners learn exactly the same decision boundary

- 1. A
- 2. B, C
- 3. A, C
- 4. A, B, C