WEEK-2 REPORT

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SUPPORT VECTOR MACHINE:

1. What are Support Vectors in SVMs?

    Solution:
    Support vectors are those instances that are located on the margin itself. For SVMS, the decision boundary is entirely determined by using only the support vectors.

2. What is the difference between logistic regression and SVM without a kernel?

    Solution:
    Only in implementation, One is much more efficient and has good optimization packages

3. Is SVM alogorithm more memory efficent than other algorithms?

    Solution:
    Yes , SVM algorithm is known to be memory efficent than other algorithms because not all the data points are required to make the decision , once the support vectors are decided , only they are needed for deciding the hyperplane not all the points.

4. What technique can be used to solve the optimization problem cast by Support Vector Machines?

    Solution: Sub-gradient Descent , i,e PEGASOS(primal estimated sub-gradient solver)

5. Are SVMs used for regression or classification?

    Solution: They can be used for both , in classification , our goal is to maximize the distance between our boundary and support vectors ; in regression , our goal is to keep all the points within the margin.

NAIVE BAYES:

1. Naive bayes is based on which mathematical concept?

    Solution:
    Bayes theorem in Statistics.

2. Is Naive bias used for regression or classification?

   Solution: Classification

3. What is the relation between the features ,considered in Naive Bayes? [10pt] **Solution:** The features are assumed to be independent.

4. What is one disadvantage of using Naive bayes?

   Solution: If the features are correlated , then it affects the performance of the model.

5. How is the conditional probability given by in Gaussian Naive Bayes classifier?

   Solution: Each feature us assumed to be distributed according to a gaussian.

$$P(x_i|y) = \frac{1}{\sqrt{2\pi\sigma_y^2}} \exp -\frac{(x - \mu_y)^2}{2\sigma_y^2} \tag{1}$$