COURSE CODE (CREDITS): 18B1WCI843

MAX. MARKS: 35

COURSE NAME: Data Analytics

COURSE INSTRUCTORS: Dr. Aman Sharma

MAX. TIME: 2 Hours

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q1. Let a Neural Network has 4 layers with ReLU activation functions for hidden layers and sigmoid activation function for the output layer. [6 Marks]
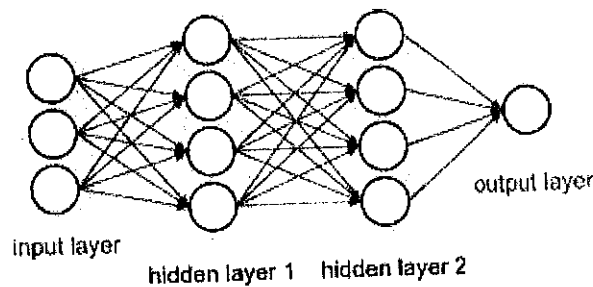
Q2. Briefly describe the following approaches with examples 1) Genetic algorithm, 2) KBANN, 3) Principal Component Analysis, 4) Decision tree, 5) Bayesian learning [6 Marks]

Q3. Briefly explain the situations where a polynomial regression model either over fits or under fits the data. Also discuss any two regularization strategies used to control over fitting in Machine Learning models. [4 Marks]

Q4. Attempt both the below mentioned questions. [4 Marks]

I. What is a kernel in SVM? Why do we use kernels in SVM? What are different types of SVM kernels?

II. Can we apply the kernel trick to logistic regression? Why is it not used in practice then?

Q5. Given a breast cancer dataset, explain how you will implement Multi-levels Stacking for breast cancer multi-classification? [5 Marks]

Q6. Write a function that accepts a list and returns a new list such that the new list contains all the items of the old list in reverse order. Note that this is NOT a sorting problem. Do NOT use

the built in reverse() method for this problem. For example if: input_list = ['apples', 'eat', "don't", 'I', 'but', 'Grapes', 'Love', 'I'] then your function should return a list such as: ['I', 'Love', 'Grapes', 'but', 'I', "don't", 'eat', 'apples'] **[3 Marks]**

Q7. Suppose you want to predict whether a person will buy a phone or not based on the phone's features. For that, you can build a simple decision tree. Using a random forest model will improve your results, as it provides diversity into building the model with several different features. Explain this case study by using the mathematics behind random forest. Use below diagram for getting the feature details. **[7 Marks]**
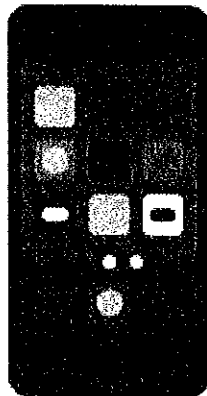
Price - $450

RAM - 6 GB

Android - Yes

Battery - 4000mAH

Camera - 30 MP

Internal storage - 128 GB

Display - 4K resolution

******************************Best of Luck******************************