MARKING SCHEME AND SOLUTION   P118-133(ESE)

DECEMBER 2018 / END-SEM

F. Y. M. TECH. (Computer Engineering) (SEMESTER - I)

COURSE NAME: Machine Learning

COURSE CODE: CSPA11183A

Q.1) a) Explain in brief different learning paradigms : 1 MARK EACH (SYATEMAT [3] INCREMENTAL,

OR

b) Identify type of learning for the following application [3]
1. You are going for a movie in the afternoon and your mother predicts that

it would rain in the afternoon (DECISION TREE:SUPERVISED)

2. In a Cricket match captain wins the toss and decided to bat(SUPERVISED)

3. Predicting rainfall based on historical data(SUPERVISED)

Q.2 a) Apply k means algorithm for the following numbers and display 3 clusters [3]

(10,123,14,15,67,45,87,23,04,98)

K=3 SELECT RANDOM 3 SEED POINTS, CALCULATE EUCLIDIEN DISTANCE OF EACH FROM THESE SEED POINTS *(e.g seed1 is 10 calculate distance of 10 from each element similarly for other 2 seed points put the smaleest distance in respective cluster, stop if previous iteration and next iteration distance is same or minimum.*

E.G C1=(04,10,14,15,23) C2= (45,67,87) C3=(98,123)

OR

Q.2 b)Draw the labeled diagram of neural network [3]
2 MARKS DIAGRAM ONE MARK LABEL .COMPONENTS INCLUDE INPUT LAYER, FEATURES, ACTIVATION FUNCTION OUTPUT LAYER.

Q.3 a) Under which circumstances would you use K-means clustering? How is the k [2]
value selected? WHEN TYPE OF DATA EVOLVED IS NOT KNOWN ,
NO CLASS LABEL AVAILALE

OR

Q.3 b) Under which circumstances is ensemble method used? What is bagging? [2]
WHEN SINGLE CLASSIIER NOT ABLE TO PREDICT CORRECTLY

Q.4 Consider a case where a friend of yours will be visiting your place. You are meeting [14]
him after a long time. You want to take him to a hotel. Would you go to a newly
opened hotel which serves different delicacies or a one where you visit often? How
can you relate both the scenarios to Reinforcement Learning? Explain the concepts
of RL in this regard with equations.

7 MARKS FOR PROBLEM IDENTIFICATION, UNDERSTANDING AND DESIGNI
MODEL + 7 MARKS HOW REINFORCEMENT LEARNING FORMS EQUATION
FEATURES(FEEDBACK, RATING, DISHES, INTEREST ETC+REWARDS IF U H
LIKES THE HOTEL PREVIOUSLY+ELSE PENALTY IF DISLIKE)

OR

Q.5 Consider the scenario like Boxer trainer How would you design a learning system [14]
which will calculate award and punishment scheme?

STRETEGY FOR WIN/LOSS NO OF MOVES, NO OF ROUNDS PLAYER PLAYI
WIN/LOSS, BEFORE LOSS ACTION , LAST 3 CONSECUTIVE ACTIONS BEFO
LOSS ,SIMILARY FOR WINNING STRETEGY

Q. 6 Why there is a need of combining multi perspectives. Explain with the help of any [14]
suitable example , Consider an approach of combing features based on priority
weighted sum of feature vector.

4 MARKS NEED +5 MARKS EXAMPLE+5 MARKS FEATURE VECTOR A
WEIGHTS ASSIGNED *e.g monitoring run time traffic and observing violation of tra*
rules from using ML based approach

OR

Q.7 Consider recommendation systems like movie rating or predicting a popularity of [14]
Politicians during election process . Apply adaptive learning method to predict the
outcome. Which supervised approach be applied for such prediction? Consider relevant
feedback given by people on various social media sites

7 MARKS FOR APPROACH+7 MARKS FOR WHY THIS APPROACH
SUPERVISED+UNSUPERVISED.

UNSUPERVISED APPROACH FOR COLLECTING USERS OF SIMILAR INTERES
SUPERVISED FOR BUILDING THE MODEL, FEATURES AND PREDICTING THE
POPUARITY

Q. 8 In any learning system, is context important or content important? Can an adaptive [10]
system help in both scenarios or work in combination of both? Put forth your
views with each aspect. How can you relate systemic learning here?

2 MARKS+4 MARKS FOR CONTEXT AND CONTENT+4 MARKS
FOR SYSTEMEATIC LEARNING
CONTEXT AND CONTENT BOTH IMPORTANT E.G. NLP PROCESSING

b) Justify how incremental learning is better than retraining a model   [04]

OR

Q 9.   Can incremental learning face a problem of catastrophic forgetting? (Forgetting   [14]
       all that is previously learnt). Explain in detail.

CATASTROPHIC FORGETTING TASKS WHICH THEY HAVE NOT EXPERIENC
FOR A LONG TIME CATASTROPIC FORGETTING: TASKS WHICH MODEL HAVE
NOT EXPERIENCED FOR A LONG TIME APPROACH: REMEMBERS OLD TASKS
SELECTIVELY SLOWING DOWN LEARNING ON THE WEIGHTS IMPORTANT
FOR THOSE TASKS