TE Sem VI (R 2019 C Scheme) "ECS" May'23

Paper / Subject Code: 89325 / : Machine Learning (DLOC)

18/5/2023

Duration: 3hrs **[Max Marks:80]**

N.B. : (1) Question No 1 is Compulsory
(2) Attempt any three questions out of the remaining five
(3) All questions carry equal marks
(4) Assume suitable data, if required and state it clearly

Q1 Attempt any **FOUR** [20]

A Explain Applications of Machine Learning

B Explain cross validation, overfitting and under fitting for ML model.

C Calculate eigenvalues for following matrix

$$A = \begin{bmatrix} 1 & 2 & 9 \\ 12 & 11 & 2 \\ 0 & 0 & 5 \end{bmatrix}$$

D What is Regularized Regression?

E Justify, Perceptron works only for linear separable problem.

Q2 A Total 16 does are there for a query, 8 are relevant and 8 are non-relevant documents. [10]

10 documents retrieved by query. Calculate precision, recall and draw confusion matrix

1	2	3	4	5	6	7	8	9	10
D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
yes	yes	no	yes	no	no	no	no	no	yes

B Explain the steps of developing a Machine Learning Application [10]

Q3 A Obtain derivation for simple linear regression using Least Square Method. [10]

B What is concept of Singular Value Decomposition (SVD) and give its applications. [10]

Q4 A Demonstrate steps for Multiple linear Regression along with example. [10]

B Explain Logistic Regression Model. [10]

Q5 A What is mean by soft assignment and hard assignment to clusters? Explain Expectation Maximization Algorithm [10]

B Explain Delta Learning Rule (LMS-Widrow Hoff) with example for AND gate (Note: Bipolar AND gate). Min one epoch is required. [10]

Q6 A Explain Hebbian Rule along with an example. [10]

B Write a short note on Principal Component Analysis [10]