RAMAIAH Institute of Technology

Department of Artificial Intelligence and Data Science

QUESTION BANK FOR IV Sem (Term: May-August 2023)

Machine learning Laboratory (AIL45)

I.A. Marks: 50 **Exam Hours: 03**
Credits: 0:0:1 **Exam Marks: 50**

Sl.No	Questions	CO Mapping
1.	Write a program to implement **linear regression** considering the dataset with attributes hours Studied = [2, 3, 4, 5, 6] and exam scores = [70, 75, 85, 90, 95]. Predict the new values for exam scores given hours Studied as 7.	CO1
2.	Write a program to implement **Gradient Descent algorithm** using the dataset California housing price prediction and perform the following operations 1. import dataset 2. display first 5 rows 3. check the number of samples of each class in Species 4. check whether the data set contains the null values 6. visualize the data in the form of graphs 7. Obtain covariance and correlation values 8. train and test model 9. Apply regression model 10. predict the accuracy and plot graph	CO1
3.	Write a program to implement logistic regression considering iris dataset and perform the following operations 1. import dataset 2. display first 5 rows 3. check the number of samples of each class in Species 4. check whether the data set contains the null values 6. visualize the data in the form of graphs 5. Obtain covariance and correlation values 6. train and test model 7. Apply regression model 8. predict the accuracy and plot graph	CO1
4.	Write a program to implement **MNIST handwritten digit classification.**	CO1
5.	Write a program to implement the **FIND-S algorithm** for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a enjoysport.CSV file.	CO2
6.	Write a program to implement the **Candidate-Elimination algorithm** to output a description of the set of all hypotheses consistent with the training examples. Read the training data from a playtennis.CSV file.	CO2
7.	Write a program to Demonstrate the working of the **decision tree based ID3 algorithm**. Use an playtennis.csv data set for building the decision tree and apply this knowledge to classify a new sample and plot the tree.	CO2

<table>
<tr><td>8.</td><td>Write a program to implement Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets.</td><td>CO2</td></tr>
<tr><td>9.</td><td>Write a program to implement the naïve Bayesian classifier to classify the following English text.
I love this sandwich, pos This is an amazing place, pos I feel very good about these cheese, This is my best work,pos What an awesome view, pos I do not like this restaurant, neg I am tired of this stuff,neg I can't deal with this,neg He is my sworn enemy, neg My boss is horrible,neg This is an awesome place, pos I do not like the taste of this juice, neg I love to dance,pos I am sick and tired of this place,neg What a great holiday, pos That is a bad locality to stay,neg We will have good fun tomorrow, pos I went to my enemy's house today,neg. Predict the following.
1. Total Instances of Dataset
2. Obtain Accuracy values
3. Obtain Recall values
4. Obtain Precision values
5. Draw Confusion Matrix</td><td>CO3</td></tr>
<tr><td>10</td><td>Write a program to implement the following using below dataset which specify classifications for nine combinations of VAR1 and VAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606, using k-means clustering with k=3 means (i.e., 3centroids)
<table><tr><th>VAR1</th><th>VAR2</th><th>CLASS</th></tr><tr><td>1.713</td><td>1.586</td><td>0</td></tr><tr><td>0.180</td><td>1.786</td><td>1</td></tr><tr><td>0.353</td><td>1.240</td><td>1</td></tr><tr><td>0.940</td><td>1.566</td><td>0</td></tr><tr><td>1.486</td><td>0.759</td><td>1</td></tr><tr><td>1.266</td><td>1.106</td><td>0</td></tr><tr><td>1.540</td><td>0.419</td><td>1</td></tr><tr><td>0.459</td><td>1.799</td><td>1</td></tr><tr><td>0.773</td><td>0.186</td><td>1</td></tr></table></td><td>CO3</td></tr>
<tr><td>11</td><td>Write a program to implement Random Forest using the dataset of California housing price prediction and perform the following operations on dataset
1. import dataset
2. display first 5 rows
3. check the number of samples of each class in Species
4. check whether the data set contains the null values
5. visualize the data in the form of graphs
6. Obtain covariance and correlation values
6. train and test the mode
7. Apply the model
8. Predict the accuracy and plot graph</td><td>CO3</td></tr>
<tr><td>12</td><td>Write a program to implement Naïve Bayes using Bayesian network model considering heart disease dataset. Use this model to predict the disease.</td><td>CO3</td></tr>
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13	Write a program to implement **K-Nearest Neighbor algorithm** using iris dataset. 1. import dataset 2. display first 5 rows 3. visualize the data in the form of graphs 6. train and test the model 7. Apply the KNN classifier 8. Classify the species by providing the test data	CO3
14	Write a program to Implement the non-parametric **Locally Weighted Regression** and perform the following operation 1. Read the Given data Sample to X and the curve (linear or non linear) to Y 2. Set the value for Smoothening parameter or Free parameter say τ 3. Set the bias /Point of interest set x0 which is a subset of X 4. Determine the weight matrix using : $$w(x, x_o) = e^{-\frac{(x-x_o)^2}{2\tau^2}}$$ 5. Determine the value of model term parameter β using : $$\hat{\beta}(x_o) = (X^T W X)^{-1} X^T W y$$ 6. Prediction = x0*β:	CO3

Marks Distribution:

Conduction and Result	Write-Up	Execution	Viva	Change of Program	Total
50M	**8M**	**35M**	**7M**	**-10 Marks**	**50 Marks**