

**U.G. 5th Semester Examination - 2021****COMPUTER SCIENCE****[HONOURS]****Discipline Specific Elective (DSE)****Course Code : COM.SC-H-DSE-P-502****[PRACTICAL]**

Full Marks : 75

Time : 4 Hours

*The figures in the right-hand margin indicate marks.***Marks Allotment :****Notebook : 5 Marks****Semester End Practical :****70 Marks (Experiment : 60 Marks, Viva : 10 Marks)**

Use Matlab/Octave or Python to write **one** of the following codes and that to be allotted on lottery basis

1. Create a 4×4 matrix and find its inverse. Add, subtract and multiply both the matrices. Colour plot all the resulting matrices considering each row as the values of different functions.
2. Consider the function  $y = \cos(x)$  and plot the function. Now from this function find discrete values of y for x values 0, 1, 2, 3 and 4. Create a table for the x and y values. Now using linear regression find values of y

for appropriate x values. Plot for the regressed values and the original function.

3. Consider the function  $y = \sin(x)$  and plot the function. Now from this function find discrete values of y for x values 0, 1, 2, 3 and 4. Create a table for the x and y values. Now using linear regression find values of y for appropriate x values. Plot for the regressed values and the original function.
4. Consider the function  $y = \cos(x) + \sin(x)$  and plot the function. Now from this function find discrete values of y for x values 0, 1, 2, 3 and 4. Create a table for the x and y values. Now using linear regression find values of y for appropriate x values. Plot for the regressed values and the original function.
5. Consider the given dataset of average salary according to experience of a company.

| Years Experience | Salary |
|------------------|--------|
| 1.1              | 39343  |
| 1.3              | 46205  |
| 1.5              | 37731  |
| 2.0              | 43525  |
| 2.2              | 39891  |
| 2.9              | 56642  |
| 3.0              | 60150  |
| 3.2              | 54445  |

*[Turn Over]*

|     |       |
|-----|-------|
| 3.2 | 64445 |
| 3.7 | 57189 |
| 3.9 | 63218 |
| 4.0 | 55794 |

Manually create a .CSV file and store it. Show the scatter plot of the data. Now consider that you are a HR manager. A new candidate comes to your company with 5 years of experience. With the help of linear regression find out the ideal salary that you would offer to the employee. Also plot the regression line on the scatter plot.

6. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.
7. Build an Artificial Neural Network by implementing the Back-propagation algorithm and test the same using appropriate data set.
8. Write a program to implement the Naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.
9. Consider the *Iris* dataset is stored in a .CSV file. Load the data and use Naive Bayes classifier to find the class

of a data whose attributes are (6.4, 3.3, 1.9, 1.3).

10. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data (heart.csv) Set (the data can be found in this link :: <https://github.com/g-shreekant/Heart-Disease-Prediction-using-Machine-Learning/archive/master.zip>).