

## MACHINE LEARNING LABORATORY

Course Code: KG21CM607

L	T	P	C
0	0	2	1

B. Tech. III Year II - Semester

**Prerequisites:** Knowledge on the concepts of Machine Learning

**Course Objectives:** The objectives of this course for the student are to:

1. Analyze complexity of Machine Learning algorithms and their limitations.
2. Implement supervised Machine Learning algorithms in real-world applications.
3. Build confidently applying common Machine Learning algorithms in practice and implementing their own.
4. Implement unsupervised Machine Learning algorithms in real-world applications.
5. Make use of modern notions in data analysis-oriented computing.

**Course Outcomes:** After completion of this course, the students will be able to

- CO1:** Analyze complexity of Machine Learning algorithms and their limitations.
- CO2:** Implement supervised Machine Learning algorithms in real-world applications.
- CO3:** Build confidently applying common Machine Learning algorithms in practice and implementing their own.
- CO4:** Implement unsupervised Machine Learning algorithms in real-world applications.

**CO5:** Make use of modern notions in data analysis-oriented computing.

**LIST OF EXPERIMENTS:**

1. The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school days in a week, the probability that it is Friday is 20 %. What is the probability that a student is absent given that today is Friday? Apply Baye's rule in python to get the result. (Ans: 15%)
2. Extract the data from database using python
3. Implement k-nearest neighbours classification using python
4. Given the following data, 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 the result of k- means clustering with 3 means (i.e., 3 centroids)

VAR1	VAR2	CLASS
1.713	1.586	0
0.180	1.786	1
0.353	1.240	1
0.940	1.566	0
1.486	0.759	1
1.266	1.106	0
1.540	0.419	1
0.459	1.799	1
0.773	0.186	1

5. The following training examples map descriptions of individuals onto high, medium and low credit - worthiness.

medium skiing design single twenties no -> highRisk

high golf trading married forties yes -> lowRisk

low speedway transport married thirties yes -> medRisk

medium football banking single thirties yes -> lowRisk

high flying media married fifties yes -> highRisk

low football security single twenties no -> medRisk

medium golf media single thirties yes -> medRisk

medium golf transport married forties yes -> lowRisk

high skiing banking single thirties yes -> highRisk

low golf unemployed married forties yes -> highRisk

Input attributes are (from left to right) income, recreation, job, status, age group, home-owner. Find the unconditional probability of 'golf' and the conditional probability of 'single' given 'medRisk' in the dataset?

6. Implement linear regression using python.
7. Implement Naïve Bayes theorem to classify the English text.
8. Implement an algorithm to demonstrate the significance of genetic algorithm.
9. Implement the finite words classification system using Back-propagation algorithm.

#### **TEXT BOOKS:**

1. Tom M. Mitchell, "Machine Learning", McGraw-Hill, 1st Edition, 1997.
2. Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 1st Edition, 2012
3. Shai Shalev-Shwartz and Shai Ben-David, "Understanding Machine