Rajiv Gandhi University of Knowledge Technologies

(Telangana Government Act 8 of 2016)

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Department of Computer Science and Engineering

Machine Learning – DataMining Research Club

Club Objectives:

➢ Educate members on what exactly is ML-DM and its possibilities. (primary)

➢ Developing the interests of members in ML-DM. (primary)

➢ Making members familiar with frameworks, best practices. (primary)

➢ The members should understand the algorithms, its maths and Real World uses. (primary)

➢ Practical and hands-on experience. (primary)

➢ Inter-college participation if any [Workshops/Conferences]. (secondary)

➢ Making students industry ready and try to provide internships. (secondary)

➢ To develop better coding culture.

➢ Promoting various domains of programming and design

Background Work:

➢ ML-DM is an extremely hot topic in the industry, with all companies hiring in this field.

➢ Practical experience and good knowledge is a must to succeed in Industry.

➢ Data, algorithms, and computation are advancing. We need skills to leverage that.

➢ Machine Learning & Data Mining has applications in all domains (Healthcare, finance, entertainment, surveillance, etc).

Club Outcomes:

Upon successful completion of this task, students will be able to:

- ➤ State the various applications available in the tool being used

- ➤ Describe the data sets and plan for transforming it into task relevant data

- ➤ Employ appropriate pre-processing techniques, based on the data sets

- ➤ Infer the mining algorithms as a component to the existing tools

- ➤ Apply mining techniques for realistic data

System Configuration Required:

Hardware:

Processor	:	Intel i5 Core
RAM	:	4 GB
Hard Disk	:	160 GB
Mouse	:	Optical Mouse

Software:

Operation System	:	Windows or Linux
Programming Language	:	Python with Required Modules Installed
IDE	:	Anaconda3 or Jupyter NoteBook [Latest Version]

Prerequisites:

- ➤ Make sure that students must and should have basic idea above Python Programming

- ➤ Idea over Python Libraries such as Numpy, Scipy, Pandas, Seaborn, SciKit-Learn, MatplotLib, Plotly & PySpark and many more

- ➤ Good at Analytical and Logical Skills

Evaluation Process:

- ➤ Students have to maintain separate record and submit week-wise reports when ever necessary

- ➤ Online Attendance will be taken through LMS & Continuous Evaluation will be done by conducting Quiz & Assignments to calculate the performance of students

Text Books:

1. Stephen Marsland, "Machine Learning –An Algorithmic Perspective", Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.

2. Tom M Mitchell, "Machine Learning", First Edition, McGraw Hill Education, 2013.

3. Data Mining – Concepts and Techniques- Jiawei Han & Micheline Kamber, Elsevier.

4. Data Mining: Practical Machine Learning Tools and Techniques-I. H. Witten and E. Frank, Morgan Kaufmann. 2000

5. Python Programming using Problem solving Approach – Reema Thareja, Oxford University Press

6. Budd, Exploring Python. McGraw Hill, 2008

7. Zelle, Python Programming: An Introduction to Computer Science. Franklin, Beedle & Assoc., 2010

8. Pearson Education Publishing Starting Out with Python 3rd (2015)

Reference Books:

1. Peter Flach, "Machine Learning: The Art and Science of Algorithms that Make Sense of Data", First Edition, Cambridge University Press, 2012.

2. Jason Bell, "Machine learning –Hands on for Developers and Technical Professionals", First Edition,Wiley, 2014

3. Ethem Alpaydin, "Introduction to Machine Learning 3e (Adaptive Computation and Machine Learning Series)", Third Edition, MIT Press, 2014

4. Building the DataWarehouse- W. H. Inmon, Wiley Dreamtech India Pvt. Ltd..

5. Data Mining Introductory and Advanced topics –Margaret H Dunham, Pea.

Online Learning Sources:
- https://onlinecourses.nptel.ac.in/
- https://www.coursera.org/learn/machine-learning?
- https://www.javatpoint.com/python-tutorial
- https://www.javatpoint.com/machine-learning
- https://www.javatpoint.com/data-mining
- https://www.udacity.com/course/intro-to-machine-learning--ud120
- https://github.com/JannesKlaas/MLiFC

Download and Install Python 3.5: https://www.python.org/downloads/

Week-Wise Task

Week-1:

Introduction to DataMining Concepts

- Data Mining Functionalities

Introduction to Machine Learning Concepts

- Learning –Types of Machine Learning

Introduction to Python Programming Language – Level-1

Introduction to Tools/ IDE:

➢ IDE-Tools [Jupiter NoteBook], Anaconda, Sublime
➢ Online [Google Colab,Kaggle Kernel] –GPU support

Programming using Python:

➢ Python Basics
➢ Python Operators and Expressions
➢ Decision Control Statements
➢ Basic Loop Structures/Iterative Statements
➢ Data Structures
➢ Introduction to Functions

Week-2:

Introduction to Python Programming Language – Level-2

➢ **File Handling**
➢ **Error and Exceptional Handling**
➢ **Multi-Threading**

Python Frameworks:

➢ **Plotting Graphs in Python** :Matplotlib , Plotting, Subplots, Images
➢ **Simple Graphics using Turtle in Python**: Turtle module, Turtle Methods
➢ **GUI Programming with tkinter Package**: tkinter module, Widgets and their functions
➢ **Numpy:** Arrays, Array indexing, Datatypes, Array math, Broadcasting
➢ **SciPy:** Image operations, MATLAB files, Distance between points
➢ **Panda –** dataframe, indexing and selection, descriptive statistics, handling missing data, reading and writing files.

Week-3:

Data Mining-Data Preprocessing Techniques

Case Study-1Task: DataPre-processing and Visualization

Start working on Sample Dataset

Week-4:

Classification and Regression
    Classification:
- Linear Classification
- Multi-class Classification

    Regression:
- Logistic Regression
- Multiple Linear Regression

Association Rule Mining

Week-5:

Different Classifier Techniques
- Decision Tree Algorithm
- K Nearest Neighbor KNN Algorithm

Week -6:

Different Classifier Techniques
- NaiveBayes Classifier Algorithm
- Support Vector Machine Algorithm

Week-7:

Clustering
- K-means Clustering Algorithm
- Hierarchical Clustering Algorithm
- Clustering Techniques

Week-8:

Artificial Neural Network
- Single-layer Perceptron (SLP)
- Multi-layer Perceptron (MLP)

Week-9:

Gradient Descent Algorithm
- ➢ Gradient Descent Algorithm Work in Machine Learning

- ➢ Forward Propagation

- ➢ Backward Propagation

Week-10:

Case Study-2 Application Oriented Based Implementation

*** WE WISH ALL THE GOOD LUCK ***

Mr.K.RAVIKANTH

Assistant Professor

ML-DM RESEARCH CLUB INCHARGE

Dept. of CSE, RGUKT-Basar.