

Department of Computer Science & Engineering

LAB MANUAL

INTELLIGENT SYSTEM LAB (CS 1763)

(B. Tech VII Semester, CSE)



INSTRUCTORS:

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SMU SIKKIM
MANIPAL
UNIVERSITY

Established under Govt. of Sikkim, Act 9 of 1995, recognised under 2(f) of the UGC Act, 1956

Sikkim Manipal Institute of Technology
Majitar, Rangpo, East Sikkim

Sikkim Manipal Institute of Technology
Sikkim Manipal University-737136
Department of Computer Science & Engineering

CERTIFICATE

This is to certify that Ms./Mr.....

*Reg. No.:..... Section:..... Roll No.:..... has satisfactorily completed the laboratory exercises prescribed for **Intelligent System Laboratory (CS1763)** of Final Year (4th) B. Tech Degree in Computer Science and Engineering at SMIT, in the Academic Year 2022-2023.*

Date:

1.

2.

Signature of Faculty In-charge(s)

Signature of The HOD-CSE

List of Experiments

Sl.	Program Title (Description of the program)	Date	Page No.	Remark	Sign.
1	A brief on Python basics (as prerequisite), advanced data structures. Introduction to NumPy Library in python. Explore any 05 functions with suitable examples.				
2	Introduction to Pandas and matplotlib library in python. Explore any 05 functions from each mentioned libraries with suitable examples.				
3	Concepts of datasets, data preprocessing. Explore “ ourworldindata.org ” and “ kaggle.com ”. Explore “ <i>Salary_data</i> ”. (Source: kaggle) and perform some necessary preprocessing tasks on it.				
4	Introduction to simple and multiple linear regression . Perform multiple linear regression on “ <i>startups</i> ” data. (source: <i>kaggle</i>)				
5	Introduction to classification problems. Explore “ <i>penguins</i> ” data set and classify using KNN algorithm . (source: <i>kaggle</i>)				
6	Classification problem using Support Vector Machine . Perform SVM with “ <i>Social_Networks_Ads</i> ” dataset (source: <i>kaggle</i>)				
7	Introduction to Decision tree algorithm . Perform DT with “ <i>Social_Networks_Ads</i> ” dataset (source: <i>kaggle</i>)				
8	Introduction to Naïve Bayes approach . Perform NB with “ <i>Social_Networks_Ads</i> ” dataset (source: <i>kaggle</i>)				
9	Perform a comparison study on the classifications done in Q-6, Q-7 and Q-8. Show				

	the results as obtained accuracy and plot each.				
10	Unsupervised Learning using K-Means clustering . Explore K-means algorithm using “ <i>Mall_customers</i> ” data set. (source: <i>kaggle</i>)				
11	Write a program to implement <i>k</i> -Nearest Neighbour algorithm to classify the iris data set . Print both correct and wrong predictions.				
12.	Introduction to ANN and implementation of ANN as classifier.				
13.	Model Deployment using Pickle and joblib.				
14.	A demo project (from Farm to Plate)				

Index (Additional Problems)

Sl.	Program Title (Description of the program)	Date	Page No.	Remark	Sign.

Course Objective

At least 12 experiments making use of data sets in implementing machine learning and deep learning algorithms and their applications to be carried out using any suitable language of choice of the subject concerned to get insight into the practical applications of the theoretical studies.

Course Outcomes

CO1	Understand Understand the implementation procedures for the machine learning/deep learning algorithms.
CO2	Design and describe Python programs/Matlab/Java for various Learning algorithms
CO3	Identify and analyze criteria and specifications appropriate to new problems, and choose the appropriate machine learning algorithm for their solution.
CO4	Apply appropriate data sets to the Machine Learning/ Deep Learning algorithms
CO5	Identify and apply Machine Learning/ Deep Learning algorithms to solve real world problems

Evaluation Plan

EVALUATION WEIGHTAGE	
Continuous Internal Evaluation: 60%	End Semester Evaluation: 40%
CONTINUOUS INTERNAL EVALUATION *	
Minimum number of labs to be conducted	12
Marks for each lab (including lab manual evaluation)	10+1.5 =11.5 marks
*Final Internal Marks shall consist of sum of marks from all the labs which is then reduced to 60 marks.	
*The assessment will be based on punctuality, program execution, maintaining observation note and Viva-voce.	

INSTRUCTIONS TO THE STUDENTS



Pre-Lab Session Instructions

1. Students should carry the Lab File and the required stationery to every lab session.
2. Be on time, wear formal dress with ID card and follow the institution standard code of conduct.
3. Must Sign in the log register provided (during 1st lab only).
4. Make sure to occupy the allotted seat and answer the attendance.
5. Adhere to the rules and maintain the decorum.
6. You must write the necessary answers, working analysis, codes, results on A4 pages and submit the same on each day lab inside a PVC channel file, mentioning your student credentials clearly on the Front/cover page of it.
7. No separate and printed lab manual (hard copy) will be provided by the department or institute. You will be shared the PDF of topics/tasks to be conducted in each lab.

In-Lab Session Instructions

- Follow the instructions on the allotted exercises.
- Show the program and results to the instructors on completion of experiments.
- On receiving approval from the instructor, copy the program and results in the Lab record.
- Prescribed textbooks and class notes can be kept ready for reference if required.

General Instructions for the exercises in Lab

- Implement the given exercise individually and not in a group.
- The programs should meet the following criteria:
 - Programs should be interactive with appropriate prompt messages, error messages if any, and descriptive messages for outputs.
 - Programs should perform input validation (Data type, range error, etc.) and five appropriate error messages and suggest corrective actions.
 - Comments should be used to give the statement of the problem and every member function should indicate the purpose of the member function, inputs and outputs.
 - Statements within the program should be properly indented.
 - Use meaningful names for variables, classes, interfaces, packages and methods.
 - Make use of constant and static members wherever needed.
- Plagiarism (copy from others) is strictly prohibited and would invite severe penalty in evaluation.
- The exercises for each week are divided under three sets:
 - Solved exercises.
 - Lab exercises- to be completed during lab hours.
 - Additional Exercises – to be completed outside the lab or in the lab to enhance the skill.
- In case a student misses a lab class, he/she must ensure that the experiment is completed during the repetition class with the permission of the faculty concerned but credit will be given only to one day's experiment(s).
- Questions for lab tests and examinations are not necessarily limited to the questions in the manual, but may involve some variations and/or combinations of the questions.
- A Sample note preparation is given as a model for observation.

Conduction of Internal Examination:

☐ ☐ All laboratory experiments are to be included for Internal examination.

Students are allowed to pick one experiment from the lot.

☐ ☐ Strictly follow the instructions as printed on the cover page of answer script.

Marks distribution: Procedure + Execution + Viva: 10 + 10 + 05 (25)

☐ ☐ Change of experiment is allowed only once and marks allotted to the procedure part to be made zero.

The students should not

- Bring mobile phones or any other electronic gadgets to the lab.
- Go out of the lab without permission.

Wishing you happy learning!