M.Sc.-II

Computer Science



Savitribai Phule Pune University

(Formerly University of Pune)

Two year M.Sc. Degree Program in Computer Science (Faculty of Science & Technology)

M.Sc.- II (Computer Science)

Choice Based Credit System Syllabus To be implemented from Academic Year 2020-2021

CSUP235 Practical on CSUT231, CSUT232 and CSUT233 Total Credits - 4

Teaching Scheme:

- 8 hours/week
- 10 Students/Batch

Pre-requisites:

- Programming in Java
- Programming in Python
- Programming in Nodejs

Course Objectives:

- To write java programs using Design Pattern and Frameworks to create reusable and flexible software systems.
- To understand about the process of deploying web apps using specific Frameworks.
- To write python programs using machine learning algorithms for solving practical problems.
- To understand about the process of deploying ML model.

Course Outcomes:

- Able to use specific frameworks as per applications need.
- Design java application using design pattern techniques.
- Process available data using python libraries and predict outcomes using Machine Learning algorithms to solve given problem.
- Able to estimate Machine Learning models efficiency using suitable metrics.

Software Architecture & Desig	n Pattern List of Assignments	# Practical's

- 1. Write a JAVA Program to implement built-in support (java.util.Observable) Weather station with members temperature, humidity, pressure and methods mesurmentsChanged(), setMesurment(), getTemperature(), getHumidity(), getPressure() Book 6: (Page No.-67)
- 2. Write a Java Program to implement I/O Decorator for converting uppercase letters to lower case letters. Book 6: (Page No.-102)
- 3. Write a Java Program to implement Factory method for Pizza Store with createPizza(), orederPizza(), prepare(), Bake(), cut(), box(). Use this to create variety of pizza's like NyStyleCheesePizza, ChicagoStyleCheesePizza etc. Book 6:(Page No.-125-130)
- 4. Write a Java Program to implement Singleton pattern for multithreading.

Book 6:(Page No.-180)

5.	Write a Java Program to implement command pattern to test Remote Control.	
	Book 6: (Page No210)	
6.	Write a Java Program to implement undo command to test Ceiling fan.	
	Book 6:(Page No222)	
7.	Write a Java Program to implement Adapter pattern for Enumeration iterator.	
	Book 6: (Page No250)	
8.	Write a Java Program to implement Iterator Pattern for Designing Menu like Breakfast,	
	Lunch or Dinner Menu.Book 6 (page no 326)	
9.	Write a Java Program to implement State Pattern for Gumball Machine. Create instance variable that holds current state from there, we just need to handle all actions, behaviors and state transition that can happen. For actions we need to implement	
	methods to insert a quarter, remove a quarter, turning the crank and display gumball.	
	Book 6: (page no 390/391)	
10.	Write a java program to implement Adapter pattern to design Heart Model to Beat	
	Model. Book 6: (page no 546/547)	
11.	Design simple HR Application using Spring Framework Book 9	

Machine Learning Practical's

Practicals

- 1. Write a python program to Prepare Scatter Plot (Use Forge Dataset / Iris Dataset)
- 2. Write a python program to find all null values in a given data set and remove them.
- 3. Write a python program the Categorical values in numeric format for a given dataset.
- 4. Write a python program to implement simple Linear Regression for predicting house price.
- 5. Write a python program to implement multiple Linear Regression for a given dataset.
- 6. Write a python program to implement Polynomial Regression for given dataset.
- 7. Write a python program to Implement Naïve Bayes.
- 8. Write a python program to Implement Decision Tree whether or not to play tennis.
- 9. Write a python program to implement linear SVM.
- 10. Write a python program to find Decision boundary by using a neural network with 10 hidden units on two moons dataset
- 11. Write a python program to transform data with Principal Component Analysis (PCA)
- 12. Write a python program to implement k-nearest Neighbors ML algorithm to build prediction model (Use Forge Dataset)
- 13. Write a python program to implement k-means algorithm on a synthetic dataset.
- 14. Write a python program to implement *Agglomerative clustering* on a synthetic dataset.

Data Sets for ML

- UCI Machine Learning Repository
- <u>www.kaggle.com</u>

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Web Frameworks Practical's

Note : Install node js and visual studio editor on your machine

- 1. Create an HTML form that contain the Student Registration details and write a JavaScript to validate Student first and last name as it should not contain other than alphabets and age should be between 18 to 50.
- 2. Create an HTML form that contain the Employee Registration details and write a JavaScript to validate DOB, Joining Date, and Salary.
- 3. Create an HTML form for Login and write a JavaScript to validate email ID using Regular Expression.
- 4. Create a Node.js file that will convert the output "Hello World!" into upper-case letters:
- 5. Using nodejs create a web page to read two file names from user and append contents of first file into second file
- 6. Create a Node.js file that opens the requested file and returns the content to the client. If anything goes wrong, throw a 404 error
- 7. Create a Node.js file that writes an HTML form, with an upload field
- 8. Create a Node.js file that demonstrate create database and table in MySQL
- 9. Create a node.js file that Select all records from the "customers" table, and display the result object on console
- 10. Create a node.js file that Insert Multiple Records in "student" table, and display the result object on console
- 11. Create a node.js file that Select all records from the "customers" table, and delete the specified record.
- 12. Create a Simple Web Server using node js
- 13. Using node js create a User Login System
- 14. Using node js create a eLearning System
- 15. Using node js create a Recipe Book
- 16. write node js script to interact with the filesystem, and serve a web page from a file
- 17. Write node js script to build Your Own Node.js Module. Use require ('http') module is a built-in Node module that invokes the functionality of the HTTP library to create a local server. Also use the export statement to make functions in your module available externally. Create a new text file to contain the functions in your module called, "modules.js" and add this function to return today's date and time.
- 18. Create a js file named main.js for event-driven application. There should be a main loop that listens for events, and then triggers a callback function when one of those events is detected.

- 19. Write node js application that transfer a file as an attachment on web and enables browser to prompt the user to download file using express js.
- 20. Create your Django app in which after running the server, you should see on the browser, the text *"Hello! I am learning Django"*, which you defined in the index view.
- 21. Design a Django application that adds web pages with views and templates.
- 22. Write and run Django code to add data to your site using relational databases with Django's Object Relational Mapper.
- 23. Develop a basic poll application (app). It should consist of two parts:
 - a) A public site in which user can pick their favourite programming language and vote.b) An admin site that lets you add, change and delete programming languages.
- 24. A public site in which user can pick their favourite programming language and vote.
- 25. An admin site that lets you add, change and delete programming languages.
- 26. Implement a simple Django application for portfolio management.
- 27. Create your own blog using Django
- 28. Build your own To-Do app in Django
- 29. Create a clone of the "Hacker News" website.
- 30. Develop Online School System using Django
- 31. Implement your E-commerce Website using Django
- 32. Implement Login System using Django