1. Apply Partitioning Methods, Hierarchical Methods, Density-Based Methods for clustering on a data set and compare the performance of the obtained results using different metrics
2. Create an ensemble using Random Forest and show the impact of bagging and boosting on the performance
3. Apply different outlier-detection methods on a noisy dataset and compare their effectiveness in terms of outliers reported
4. Compute similarity between two documents after required document preparation
5. Considering a time-stamped data (sales data/weather data), compare the aggregate values visually using different moving windows function
6. Write a program to find the latent topics in a document using any topic modeling method and display top 5 terms that contribute to each topic along with their strength. Also, visualize the distribution of terms contributing to the topics.

Project: Students should be promoted to take up one project covering at least one unit of the syllabus on any UCI/kaggle/data.gov.in or a dataset verified by the teacher. This will allow the students to have a practical knowledge of how to apply the various skills learnt in the subject for a single problem/project.

GE4b/DSE: INTRODUCTION TO WEB PROGRAMMING

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Introduction to web programming	4	3	0	1	Pass in Class XII	NIL

Course Objectives

The course aims at introducing the basic concepts and techniques of client side web programming. The student shall be able to develop simple websites using HTML, CSS and Javascript.

Learning outcomes

On successful completion of the course, students will be able to :

● Build websites using the elements of HTML.

● Build dynamic websites using the client side programming techniques with CSS, Javascript and jQuery.

● Learn to validate client-side data

Syllabus

Unit 1 **(5 hours)**

Introduction:

Introduction to Internet and web design. Basic concepts of web architecture.

Unit 2 **(12 hours)**

HTML:

Introduction to hypertext mark-up language (html), creating web pages, lists, hyperlinks, tables, web forms, inserting images, frames.

Unit 3 **(8 hours)**

Cascading style sheet (CSS):

Concept of CSS, creating style sheet, Importing style sheets, CSS properties, CSS styling (background, text format, controlling fonts), CSS rules, Style Types, CSS Selectors, CSS cascade, working with block elements and objects, working with lists and tables, CSS id and class, box model (introduction, border properties, padding properties, margin properties).

Unit 4 **(10 hours)**

Javascript:

Document object model, data types and variables, functions, methods and events, controlling program flow, JavaScript object model, built-in objects and operators, validations.

Unit 5 **(10 hours)**

jQuery and JSON:

Introduction to jQuery, syntax, selectors, events. JSON file format for storing and transporting data.

Essential/recommended readings

1. Nixon, R. Learning PHP, MySQL & JavaScript with jQuery, CSS and HTML5, O'Rielly, 2018.

2. Powell, T.A. HTML & CSS: The Complete Reference, 5th edition, Tata McGrawHill, 2010.

3. Duckett, J. JavaScript and JQuery: Interactive Front-End Web Development, Wiley, 2014.

Additional References

1. Minnick, J. Web Design with HTML5 and CSS3, 8th edition, Cengage Learning, 2015.

2. Boehm, A., & Ruvalcaba, Z. Munarch's HTML5 and CCS, 4th edition, Mike Murach & Associates, 2018.

3. J. A. Ramalho Learn Advanced HTML 4.0 with DHTML, BPB Publications, 2007.

4. Ivan Bayross Web Enabled Commercial Application Development Using Html, Dhtml, Javascript, Perl CGI, BPB Publications, 2009.

Suggested Practical List (If any): (30 Hours)

Practical exercises such as

HTML

1. Create an HTML document with following formatting – Bold, Italics, Underline, Colors, Headings, Title, Font and Font Width, Background, Paragraph, Line Brakes, Horizontal Line, Blinking text as well as marquee text.
2. Create an HTML document with Ordered and Unordered lists, Inserting Images, Internal and External linking

3. Create an HTML displaying this semester's time table.
4. Create a website with horizontal and vertical frames. Top horizontal frame showing your college's name and logo. Bottom horizontal frame split into two vertical frames. The left frame with hyperlinks to pages related to faculty, courses, student activities, etc. The right frame showing corresponding pages based on the link clicked on the left frame.
5. Create a student registration form using HTML which has the following controls:

   Text Box
   Dropdown box
   Option/radio buttons

   Check boxes Reset and Submit button

CSS

Create a webpage for your department with drop down navigation menu for faculty, courses, activities, etc.. Implement the webpage using styles, rules, selectors, ID, class.

Javascript

1. Create event driven programs for the following:

   a. Enter a number and on click of a button print its multiplication table.
   b. Print the largest of three numbers entered by the user.
   c. Find the factorial of a number entered by the user.
   d. Enter a list of positive numbers using the prompt terminated by a zero. Find the sum and average of these numbers.

2. Create a student registration form using text, radio button, check box, drop down box, text field and all other required HTML elements. Customise the CSS and javascript to input and validate all data. Create functions to perform validation of each element, example:

   a. Roll number is a 7-digit numeric value
   b. Name should be an alphabetical value(String)

   c. Non-empty and valid fields like DOB

jQuery and JSON

1. Change text color and contents using button click events using jQuery

2. Select elements using ID, class, elements name, attribute name
3. Run code on click events in jQuery
4. Handle HTML form, store the data in JSON object, pass them to another page and display it there using jQuery/Javascript

GE6d/DSE: DATA PRIVACY

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Data Privacy	4	3	0	1	Pass in Class XII	NIL

Objective:

This course aims to provides students with the ability to identify privacy related aspects of data uses, attacks on data privacy, evaluate proposed technical mechanisms for privacy protection and understand ethical issues related to data privacy

Course Learning Outcomes:

By the end of this course, students will be able to:

- Understand the basic principles of data privacy and the implications of data breaches.
- Identify and evaluate different methods of protecting sensitive data.