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ज्ञानम् सकलजनहिताय
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(Id.No. PU/PN/Engg./093 (1992)
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INDEX

Expt. No	Title of the Experiment	Date on which		Page No.	Remarks/ Signature
		Experiment Performed	Experiment and result Submitted		
Group A : Data Science					
1	**Data Wrangling, I** Perform the following operations using Python on any open source dataset (e.g., data.csv) 1. Import all the required Python Libraries. 2. Locate an open source data from the web (e.g., https://www.kaggle.com). Provide a clear description of the data and its source (i.e., URL of the web site). 3. Load the Dataset into pandas data frame. 4. Data Pre-processing: check for missing values in the data using pandas isnull(), describe() function to get some initial statistics. Provide variable descriptions. Types of variables etc. Check the dimensions of the data frame. 5. Data Formatting and Data Normalization: Summarize the types of variables by checking the data types (i.e., character, numeric, integer, factor, and logical) of the variables in the data set. If variables are not in the correct data type, apply proper type conversions. 6. Turn categorical variables into quantitative variables in Python. In addition to the codes and outputs, explain every operation that you do in the above steps and explain everything that you do to import/read/scrape the data set	23/01/25	30/01/25	1-10	
2	**Data Wrangling II** Create an "Academic performance" dataset of students and perform the following operations using Python. 1. Scan all variables for missing values and inconsistencies. If there are missing values and/or inconsistencies, use any of the suitable techniques to deal with them. 2. Scan all numeric variables for outliers. If there are outliers, use any of the suitable techniques to deal with them.	30/01/25	06/02/25	10-20	

	3. Apply data transformations on at least one of the variables. The purpose of this transformation should be one of the following reasons: to change the scale for better understanding of the variable, to convert a non-linear relation into a linear one, or to decrease the skewness and convert the distribution into a normal distribution. Reason and document your approach properly.				
3	**Descriptive Statistics - Measures of Central Tendency and variability** Perform the following operations on any open source dataset (e.g., data.csv) 1. Provide summary statistics (mean, median, minimum, maximum, standard deviation) for a dataset (age, income etc.) with numeric variables grouped by one of the qualitative (categorical) variable. For example, if your categorical variable is age groups and quantitative variable is income, then provide summary statistics of income grouped by the age groups. Create a list that contains a numeric value for each response to the categorical variable. 2. Write a Python program to display some basic statistical details like percentile, mean, standard deviation etc. of the species of 'Iris-setosa', 'Iris-versicolor' and 'Iris-versicolor' of iris.csv dataset. Provide the codes with outputs and explain everything that you do in this step.	06/02/25	13/02/25	21-30	
4	**Data Analytics I** Create a Linear Regression Model using Python/R to predict home prices using Boston Housing Dataset (https://www.kaggle.com/c/boston-housing). The Boston Housing dataset contains information about various houses in Boston through different parameters. There are 506 samples and 14 feature variables in this dataset. The objective is to predict the value of prices of the house using the given features.	13/02/25	14/02/25	31-42	
5	**Data Analytics II** 1. Implement logistic regression using Python/R to perform classification on Social_Network_Ads.csv dataset. 2. Compute Confusion matrix to find TP, FP, TN, FN, Accuracy, Error rate, Precision, Recall on the given dataset.	14/02/25	27/02/25	43-52	

6	**Data Analytics III** 1. Implement Simple Naïve Bayes classification algorithm using Python/R on iris.csv dataset. 2. Compute Confusion matrix to find TP, FP, TN, FN, Accuracy, Error rate, Precision, Recall on the given dataset	27/02/25	28/02/25	53-58	
7	**Text Analytics** 1. Extract Sample document and apply following document pre-processing methods: Tokenization, POS Tagging, stop words removal, Stemming and Lemmatization. 2. Create representation of document by calculating Term Frequency and Inverse Document Frequency	28/02/25	20/03/25	59-67	
8	**Data Visualization I** 1. Use the inbuilt dataset 'titanic'. The dataset contains 891 rows and contains information about the passengers who boarded the unfortunate Titanic ship. Use the Seaborn library to see if we can find any patterns in the data. 2. Write a code to check how the price of the ticket (column name: 'fare') for each passenger is distributed by plotting a histogram	20/03/25	27/03/25	68-74	
9	**Data Visualization II** 1. Use the inbuilt dataset 'titanic' as used in the above problem. Plot a box plot for distribution of age with respect to each gender along with the information about whether they survived or not. (Column names: 'sex' and 'age') 2. Write observations on the inference from the above statistics	27/03/25	03/04/25	75-80	
10	**Data Visualization III** Download the Iris flower dataset or any other dataset into a DataFrame. (e.g., https://archive.ics.uci.edu/ml/datasets/Iris). Scan the dataset and give the inference as: 1. List down the features and their types (e.g., numeric, nominal) available in the dataset. 2. Create a histogram for each feature in the dataset to illustrate the feature distributions. 3. Create a boxplot for each feature in the dataset. 4. Compare distributions and identify outliers.	03/04/25		81-86	

Group B- Big Data Analytics – JAVA/SCALA (Any three)					
1	Write a code in JAVA for a simple WordCount application that counts the number of occurrences of each word in a given input set using the Hadoop MapReduce framework on local-standalone set-up			87-92	
2	Locate dataset (e.g., sample_weather.txt) for working on weather data which reads the text input files and finds average for temperature, dew point and wind speed.			93-95	
3	Write a simple program in SCALA using Apache Spark framework			96-101	
Group C- Mini Projects/ Case Study – PYTHON/R (Any TWO Mini Project)					
1	Case Study			--	
2	Mini-project			--	

This is to certify that Mr./ **Miss. Piyusha Rajendra Supe** of class **TE-B (Computer)** Roll No. **23CO315** has completed all the practical work as listed above, satisfactorily in the subject of **Data Science and Big Data Analytics Laboratory (310256)** in the Department of **Computer** Engineering as prescribed by the Savitribai Phule Pune University. During the academic year **2024-2025**.

	(Prof. V. S. Gunjal)	**(Prof. V. M. Kanavde)**	**(Dr. S. V. Athawale)**
Date	**Prof. In-charge**	**Prof. In-charge**	**Head of Department**

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INDEX

<table>
<tr><th rowspan="2">Expt. No</th><th rowspan="2">Title of the Experiment</th><th colspan="2">Date on which</th><th rowspan="2">Page No.</th><th rowspan="2">Remarks/ Signature</th></tr>
<tr><th>Experiment Performed</th><th>Experiment and result Submitted</th></tr>
<tr><td>1</td><td>Case study:
Before coding of the website, planning is important, students should visit different websites (Min. 5) for the different client projects and note down the evaluation results for these websites, either good website or bad website in following format:
<table><tr><th>Sr. No.</th><th>Website URL</th><th>Purpose of Website</th><th>Things liked in the website</th><th>Things disliked in the website</th><th>Overall evaluation of the website (Good/Bad)</th></tr></table>From the evaluation, students should learn and conclude different website design issues, which should be considered while developing a website</td><td></td><td></td><td>--</td><td></td></tr>
<tr><td>2</td><td>Implement a web page index.html for any client website (e.g., a restaurant website project) using following:
a. HTML syntax: heading tags, basic tags and attributes, frames, tables, images, lists, links
for text and images, forms etc.
b. Use of Internal CSS, Inline CSS, External CSS</td><td></td><td></td><td>1-6</td><td></td></tr>
<tr><td>3</td><td>Design the XML document to store the information of the employees of any business organization and demonstrate the use of:
a) DTD
b) XML Schema
And display the content in (e.g., tabular format) by using CSS/XSL</td><td></td><td></td><td>7-12</td><td></td></tr>
<tr><td>4</td><td>Implement an application in Java Script using following:
a) Design UI of application using HTML, CSS etc.
b) Include Java script validation
c) Use of prompt and alert window using Java Script
e.g., Design and implement a simple calculator using Java Script for operations like addition, multiplication, subtraction, division, square of number etc.
a) Design calculator interface like text field for input and output, buttons for numbers and operators etc.
b) Validate input values
c) Prompt/alerts for invalid values etc.</td><td></td><td></td><td>13-17</td><td></td></tr>
<tr><td>5</td><td>Implement the sample program demonstrating the use of Servlet.
e.g., Create a database table ebookshop (book_id, book_title, book_author, book_price, quantity) using database like Oracle/MySQL etc. and display (use SQL select query) the table content using servlet</td><td></td><td></td><td>18-23</td><td></td></tr>
</table>

6	Implement the program demonstrating the use of **JSP**. e.g., Create database table students_info (stud_id, stud_name, class, division, city) using database like Oracle/MySQL etc. and display (use SQL select query) the table content using JSP.			24-29	
7	Build a dynamic web application using **PHP and MySQL**. a. Create database tables in MySQL and create connection with PHP. b. Create the add, update, delete and retrieve functions in the PHP web app interacting with MySQL database			30-35	
8	Design a login page with entries for name, mobile number email id and login button. Use **struts** and perform following validations a. Validation for correct names b. Validation for mobile numbers c. Validation for email id d. Validation if no entered any value e. Re-display for wrongly entered values with message f. Congratulations and welcome page upon successful entries			36-39	
9	Design an application using **Angular JS**. e.g., Design registration (first name, last name, username, password) and login page using Angular JS			40-44	
10	Design and implement a business interface with necessary business logic for any web application using **EJB**. e.g., Design and implement the web application logic for deposit and withdraw amount transactions using EJB			45-49	
11	**Mini Project**: Design and implement a dynamic web application for any business functionality by using web development technologies that you have learnt in the above given assignments.			--	

This is to certify that Mr./ **Miss. Piyusha Rajendra Supe** of class **TE-B (Computer)** Roll No. **23CO315** has completed all the practical work as listed above, satisfactorily in the subject of **Web Technology Laboratory (310257)** in the Department of **Computer** Engineering as prescribed by the Savitribai Phule Pune University. During the academic year **2024-2025**.

(Dr. S. F. Sayyad) **(Dr. S. V. Athawale)**

Date **Prof. In-charge** **Head of Department**

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INDEX

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Part I: Artificial Intelligence					
Group A					
1	Implement depth first search algorithm and Breadth First Search algorithm, Use an undirected graph and develop a recursive algorithm for searching all the vertices of a graph or tree data structure	22/01/25	29/01/25	1-6	
2	Implement A star Algorithm for any game search problem	29/01/25	05/02/25	7-12	
3	Implement Greedy search algorithm for any of the following application: I. Selection Sort II. Minimum Spanning Tree III. Single-Source Shortest Path Problem IV. Job Scheduling Problem V. Prim's Minimal Spanning Tree Algorithm VI. Kruskal's Minimal Spanning Tree Algorithm VII. Dijkstra's Minimal Spanning Tree Algorithm	05/02/25	12/02/25	13-16	
Group B					
4	Implement a solution for a Constraint Satisfaction Problem using Branch and Bound and Backtracking for n-queens problem or a graph colouring problem	12/02/25	05/03/25	17-20	
5	Develop an elementary chat-bot for any suitable customer interaction application.	05/03/25	25/03/25	21-29	
Group C					
6	Implement any one of the following Expert System I. Information management II. Hospitals and medical facilities III. Help desks management IV. Employee performance evaluation V. Stock market trading VI. Airline scheduling and cargo schedules	25/03/25	02/04/25	30-32	

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Part II: Elective II Cloud Computing					
1	Case study on Amazon EC2 and learn about Amazon EC2 web services			1-4	
2	Installation and configure Google App Engine			5-7	
3	Creating an Application in SalesForce.com using Apex programming Language			8-11	
4	Design and develop custom Application (Mini Project) using Salesforce Cloud.			12-15	
5	Mini-Project			--	

This is to certify that Mr./ **Miss. Piyusha Rajendra Supe** of class **TE-B (Computer)** Roll No. **23CO315** has completed all the practical work as listed above, satisfactorily in the subject of **Laboratory Practice II (310258)** in the Department of **Computer** Engineering as prescribed by the Savitribai Phule Pune University. During the academic year **2024-2025**.

	(Prof. V. M. Kanavde)	**(Prof. A. U. Khandait)**	**(Dr. S. V. Athawale)**
Date	**Prof. In-charge**	**Prof. In-charge**	**Head of Department**