BUDHA DAL PUBLIC SCHOOL, PATIALA

LESSON PLAN OF CLASS XII (SUBJECT: INFORMATICS PRACTICES 065)
Term –I & Final Exams Syllabus (Session 2024-25)

Term-I

Unit 1: Data Handling using Pandas – I

- Introduction to Python libraries – Pandas, Matplotlib
- Data Structure in Pandas – Series and Data Frames
- Series: Creation of Series from – ndarray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing and Slicing.
- Data Frames: creation - from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns: add, select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing;
- Importing/Exporting Data between CSV files and Data Frames.

Data Visualization

- Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram, Customizing plots: adding label, title, and legend in plots.

Unit 3: Introduction to Computer Networks

Introduction to networks, Types of network: PAN, LAN, MAN, WAN.

Network Devices: modem, hub, switch, repeater, router, gateway

Network Topologies: Star, Bus, Tree, Mesh.

Introduction to Internet, URL, WWW, and its applications- Web, email, Chat, VoIP.

Website: Introduction, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website.

Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

Term – 2

Unit 2: Database Query using SQL

Revision of database concepts and SQL commands covered in class XI

Math functions: POWER (), ROUND (), MOD ().

Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING ()/SUBSTR (),

LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ().

Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ().

Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (); using COUNT (*).

Querying and manipulating data using Group by, Having, Order by.

Working with two tables using equi-join

Unit 4: Societal Impacts

Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act.

E-waste: hazards and management.

Awareness about health concerns related to the usage of technology.

Month Wise Distribution

April /May

Unit 1: Data Handling using Pandas – I

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July

Data Visualization

- Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram, Customizing plots: adding label, title, and legend in plots.

August

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September

First Term Exams

Term-II

October

Unit 2: Database Query using SQL

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E-waste: hazards and management.

Awareness about health concerns related to the usage of technology.

November

Revision

December

Term – 2 Exams

January

Pre Board Exams

Periodic Test – 1

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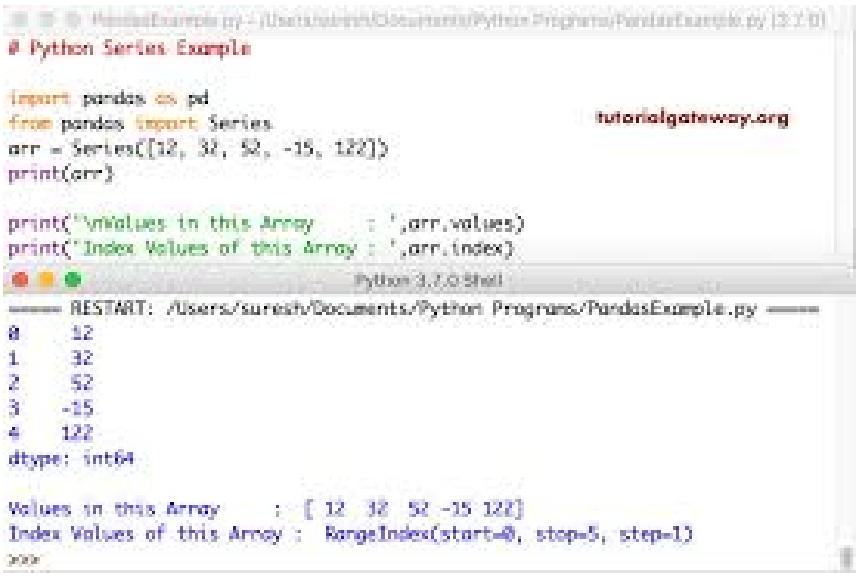
Periodic Test – 2

Unit 2: Database Query using SQL

Lesson Plan

April/May – Unit 1: Data Handling using Pandas – I



Topics:

- Introduction to Python libraries – Pandas, Matplotlib.
- Data Structure in Pandas – Series and Data Frames.
- Series: Creation of Series from – ndarray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing, and Slicing.
- Data Frames: creation - from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns: add,

select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing.

- Importing/Exporting Data between CSV files and Data Frames.

Learning Objectives:

- Introduce Python libraries Pandas and Matplotlib for data handling and visualization.
- Understand the structure and operations of Series and Data Frames in Pandas.
- Learn to manipulate and analyze data using Pandas functionalities.

Activities/Projects:

- Hands-on exercises to create Series and Data Frames from different data sources.
- Projects to perform data operations like selection, indexing, and slicing.
- Importing and exporting data between CSV files and Pandas Data Frames.

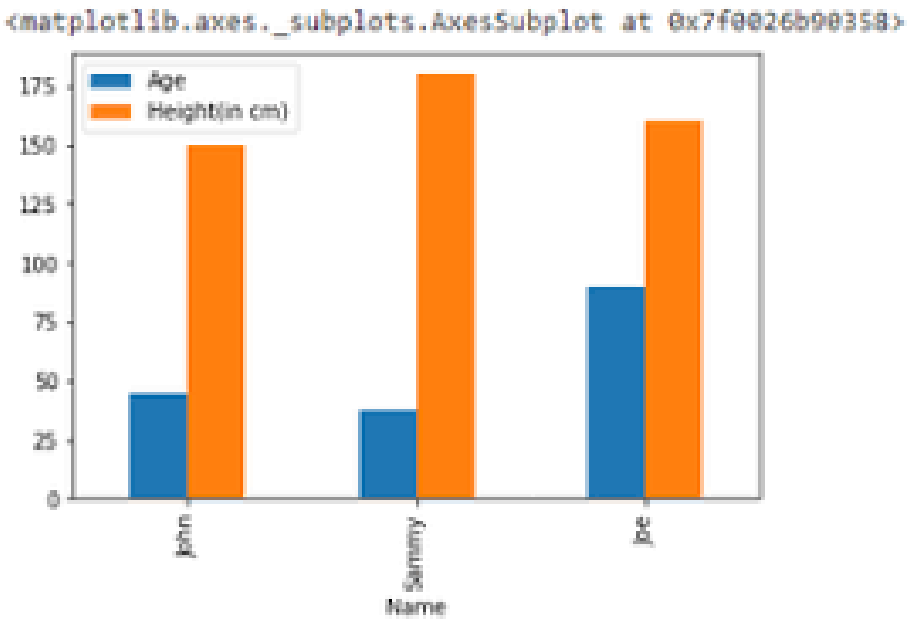
Expected Learning Outcomes:

- Students will be proficient in using Pandas for data manipulation and analysis.
- They will demonstrate skills in importing, exporting, and transforming data using Pandas.
- Students will understand the applications of Matplotlib for data visualization.

Assessment:

- Data manipulation tasks and assignments using Pandas.
- Data visualization projects using Matplotlib.

July – Data Visualization



Topics:

- Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram.
- Customizing plots: adding label, title, and legend in plots.

Learning Objectives:

- Understand the importance and techniques of data visualization.
- Learn to create and customize different types of plots using Matplotlib.

Activities/Projects:

- Practical sessions to create line plots, bar graphs, and histograms.

- Projects to customize plots with labels, titles, and legends.

Expected Learning Outcomes:

- Students will grasp the importance of data visualization in data analysis.
- They will create and interpret various types of plots using Matplotlib.
- Students will effectively communicate insights from data through visual representation.

Assessment:

- Plotting assignments and projects using Matplotlib.
- Evaluation based on the clarity and effectiveness of visualizations.

August – Unit 3: Introduction to Computer Networks

Topics:

- Introduction to networks, Types of network: PAN, LAN, MAN, WAN.
- Network Devices: modem, hub, switch, repeater, router, gateway.
- Network Topologies: Star, Bus, Tree, Mesh.
- Introduction to Internet, URL, WWW, and its applications- Web, email, Chat, VoIP.
- Website: Introduction, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website.
- Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

Learning Objectives:

- Explore the fundamentals of computer networks and the internet.
- Understand network types, devices, topologies, and protocols.
- Learn about web technologies, servers, and browsers.

Activities/Projects:

- Practical demonstrations of network devices and topologies.
- Simulations of internet protocols and web technologies.
- Projects to set up and configure basic network components.

Expected Learning Outcomes:

- Students will comprehend the basics of computer networks and their components.
- They will differentiate between network types, topologies, and protocols.

- Students will demonstrate knowledge of web technologies and browser functionalities.

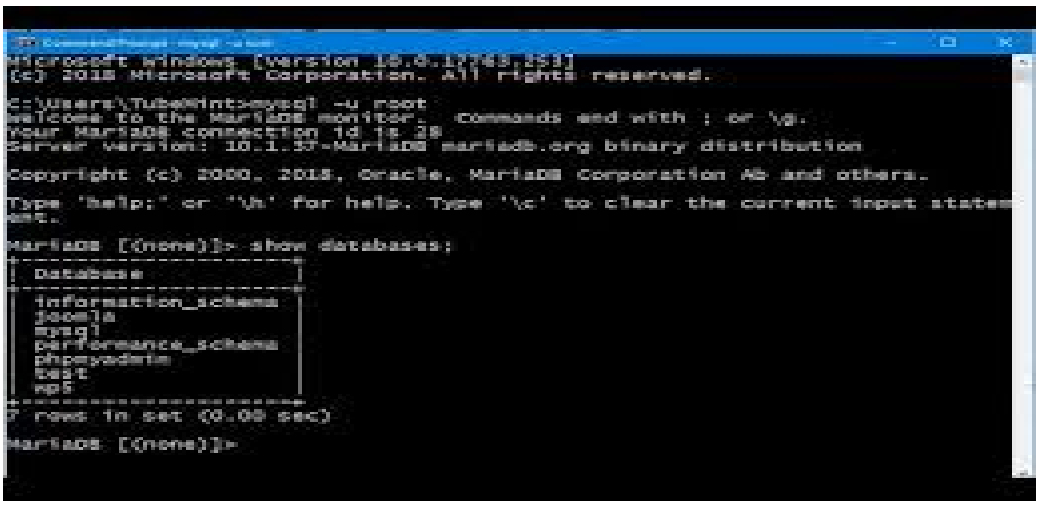
Assessment:

- Network setup projects and practical exams.
- Quizzes on network types, protocols, and web technologies.

September – First Term Exams

- Examination covering topics from April to August.

October – Unit 2: Database Query using SQL



Topics:

- Revision of database concepts and SQL commands covered in class XI.
- Math functions: POWER (), ROUND (), MOD ().
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- Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ().
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- Querying and manipulating data using Group by, Having, Order by.
- Working with two tables using equi-join.

Learning Objectives:

- Review and reinforce database concepts and SQL commands.
- Explore advanced SQL functions and their applications.
- Practice querying and manipulating data using SQL.

Activities/Projects:

- SQL query exercises covering mathematical, text, and date functions.
- Projects involving aggregate functions and data manipulation tasks.
- Database scenarios requiring join operations and query optimization.

Expected Learning Outcomes:

- Students will review and apply SQL commands for data querying and manipulation.
- They will demonstrate proficiency in using SQL functions and aggregate queries.
- Students will solve complex database problems involving multiple tables.

Assessment:

- SQL query assignments and projects.
- Practical exams on SQL commands and query optimization.

Unit 4: Societal Impacts

Topics:

- Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act.
- E-waste: hazards and management.
- Awareness about health concerns related to the usage of technology.

Learning Objectives:

- Understand the societal impacts of technology use and digital presence.
- Explore ethical considerations in information technology.
- Learn about legal aspects, cyber laws, and safety measures in IT.

Activities/Projects:

- Case studies on cybercrime incidents and ethical dilemmas.
- Projects on digital footprint analysis and privacy protection.
- Awareness campaigns on e-waste management and technology-related health issues.

Expected Learning Outcomes:

- Students will analyze the ethical and legal implications of technology use.
- They will demonstrate awareness of cybersecurity and data protection measures.
- Students will promote responsible use of technology and sustainable practices.

Assessment:

- Case study presentations and ethical dilemmas analysis.
- Projects on e-waste management and cybersecurity awareness.

This structured lesson plan should effectively guide the teaching and learning process from April to October, covering essential topics in data handling, visualization, computer networks, SQL databases, and societal impacts of technology.