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L.B.Reddy Nagar, Mylavaram-521230, N.T.R Dist., Andhra Pradesh, India.**

Department of Electronics and Communication Engineering

Date:05.12.2023

Workshop Report on Data Analysis Using Python

1. Introduction

A comprehensive 6-day workshop on **Data Analysis Using Python** was organized to provide participants with an in-depth understanding of data analysis techniques and tools using Python. The workshop was designed for students eager to acquire practical skills in handling, analysing, and visualizing data for real-world applications.

2. Workshop Details

- **Title:** Data Analysis Using Python
 - **Duration:** 6 Days
 - **Dates:** 27.11.2023 to 02.12.2023
 - **Venue:** LBRCE Online Mode
 - **Organized By:** Andhra Pradesh skill Development corporation
 - **Participants:** 194 III-Year ECE students
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3. Objectives

The workshop aimed to:

- Introduce participants to Python for data analysis
 - Enable data manipulation using Pandas and NumPy
 - Teach data visualization with Matplotlib and Seaborn
 - Cover data cleaning, exploratory data analysis (EDA), and basic statistics
 - Implement a real-world mini-project using acquired skills
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4. Day-wise Summary

Day 1: Introduction to Python and Development Environment

- Overview of Python and its applications in data science
- Installation and setup: Anaconda, Jupyter Notebook, and Google Colab
- Python basics: variables, data types, loops, functions, and file handling
- Hands-on exercises and quizzes

Day 2: Working with Data using Pandas and NumPy

- Introduction to NumPy arrays and basic operations
- DataFrames and Series in Pandas
- Reading data from CSV, Excel, and web sources
- Data selection, filtering, sorting, and grouping
- Hands-on tasks using sample datasets

Day 3: Data Cleaning and Preparation

- Handling missing values and duplicates
- Data transformation and normalization
- String manipulation and data type conversions
- Combining and merging datasets
- Case studies on messy datasets

Day 4: Data Visualization Techniques

- Plotting with Matplotlib: line, bar, scatter, and pie charts
- Advanced visualization with Seaborn: histograms, heatmaps, box plots
- Customizing plots (labels, legends, titles)
- Real-time plotting and dashboards overview
- Interactive practice sessions

Day 5: Exploratory Data Analysis (EDA) and Statistics

- Understanding distributions, central tendency, and variability
- Correlation and covariance
- Outlier detection
- Performing EDA on real-world datasets (e.g., Titanic, COVID-19, Sales Data)
- Team-based mini EDA projects

Day 6: Capstone Project and Presentations

- Group project: Apply full workflow from data loading to insight generation
- Project topics: Sales analysis, customer behavior, health data, etc.
- Each team presented their project with visualizations and findings

- Feedback and Q&A session
 - Certificate distribution and valedictory ceremony
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5. Tools and Technologies Used

- **Language:** Python
 - **Platforms:** Jupyter Notebook, Google Colab
 - **Libraries:** Pandas, NumPy, Matplotlib, Seaborn, SciPy
 - **Datasets:** Open datasets from Kaggle, UCI, and custom Excel files
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6. Outcomes and Learnings

Participants gained the following skills:

- Proficiency in Python programming for data analysis
 - Ability to clean, analyze, and visualize real-world data
 - Confidence in using libraries like Pandas and Seaborn for insights
 - Hands-on experience with data storytelling through visual presentations
 - Collaboration and teamwork through capstone projects
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7. Feedback and Suggestions

The workshop received highly positive feedback. Participants appreciated the clear explanations, hands-on approach, and the balance between theory and practice. Many suggested follow-up workshops on machine learning and data science applications.

8. Conclusion

The 6-day workshop proved to be highly effective in equipping attendees with essential data analysis skills using Python. The active participation, enthusiasm, and quality of projects presented demonstrated the success of the program. It laid a solid foundation for further learning in data science, machine learning, and analytics.