

Data Manipulation & Visualisation 600

1. Overview

This programme prepares participants to manipulate, transform, and visualise data using Python programming libraries for data science applications. Participants explore data manipulation with Pandas and NumPy, and data visualisation techniques using Matplotlib, Seaborn, and Plotly. The programme develops practical skills for data analysts, data scientists, and business intelligence professionals working with complex datasets and creating meaningful data visualisations.

2. Learning Outcome:

- Create and manipulate Pandas Series and DataFrames, explore datasets using `read_csv`, `head`, `info`, and `sort` functions, apply data cleaning techniques including filling null values, removing duplicates, and handling outliers
- Work with different data types in Pandas, create new columns for data transformation, apply grouping and aggregating operations on data, and merge and join datasets for comprehensive data analysis
- Create and manipulate NumPy arrays with various attributes, sort arrays along rows or columns, perform computations on NumPy arrays, and apply broadcasting techniques for efficient numerical data manipulation
- Apply the Matplotlib library for data visualisation, create line plots, bar charts, and scatter plots, customise plots with titles, labels, colours, and styles, and develop multiple subplots for complex visualisations
- Apply Seaborn library for advanced data visualisation, create distribution plots and univariate histograms, generate heatmaps, including correlation heatmaps for data relationship analysis
- Apply Plotly library for interactive visualisations in Python, create scatter plots, line charts, bar charts, bubble charts, box plots, histograms, and heatmaps, and implement Dash basics for layout design in interactive dashboards

Qualification:	Certificate of Competence
Duration:	4-Months
Programme Type:	Category B – Workplace-Based Learning Programme
Programme ID:	PA0106
NQF Level:	6
Credits:	15
Contact Days:	Three (3) facilitated online workshops (recordings available)
Prerequisites:	Grade 12 Qualification or NQF Level 4 equivalent
Training Options:	Online Learning: Please contact our Sales team to confirm the next available intake date for this programme.
Minimum Learner Required:	(1) Online

**A choice of leveraged programmes for any person,
At any level, in any department, of any company, in any industry.**

3. Topics

- Introduction to Data Manipulation and Visualisation
- Introduction to Pandas
- Creating and Managing Pandas Series and DataFrames
- Importing and Exploring Datasets
- Data Cleaning and Preprocessing
- Handling Missing Values, Duplicates, and Outliers
- Data Transformation and Feature Engineering
- Sorting, Filtering, and Selecting Data
- Grouping, Aggregating, and Summarising Data
- Merging and Joining Datasets
- Introduction to NumPy
- NumPy Arrays and Array Operations
- Numerical Computing with NumPy
- Broadcasting Techniques
- Introduction to Data Visualisation
- Data Visualisation with Matplotlib
- Creating Line Charts, Bar Charts, and Scatter Plots
- Customising Charts (Titles, Labels, Colours, Legends, and Styles)
- Creating Multiple Subplots
- Data Visualisation with Seaborn
- Distribution Plots and Histograms
- Heatmaps and Correlation Analysis
- Interactive Data Visualisation with Plotly
- Creating Interactive Charts and Dashboards
- Introduction to Dash for Interactive Applications
- Data Storytelling and Visualisation Best Practices
- Practical Data Manipulation and Visualisation Projects

4. Workplace-Based Learning Programme

This WLP is a fusion of academic learning and practical work. The learning is directly applied to the workplace by using client-based mentors and extensive workplace-based portfolio work and assignments. Apart from the obvious benefits of a workplace directed qualification, each WLP qualifies for recognition as a Category B Skills Programme in the Learning Matrix of the Amended BEE codes, which allows for the salaries of participants to be recognized as part of the Skills Development Expenditure.

We trust that the above is in order and look forward to hearing from you for Implementation