Task 2 | Visualisation | AI & Computational MIS

Introduction to Plotly Dash:

Plotly Dash is an open-source Python framework for building web applications with custom data visualizations. It is built on top of Plotly.js and React.js and allows for the creation of highly interactive, web-based data dashboards. Dash applications are composed of two parts: the layout that describes what the application looks like, and the callbacks that define the interactivity of the application. Check out the official tutorial (https://dash.plotly.com/tutorial).

Task 1: Interactive Scatter Plot with Dash

Objective: Create an interactive scatter plot using Dash.
Dataset: Iris dataset (sklearn.datasets.load_iris() or UCI Machine Learning Repository).

Requirements:

- Plot Sepal Length vs. Petal Length.
- Add dropdowns to select different features for axes.
- Include hover data showing all feature values for each point.

Task 2: Time Series Analysis with Dash

Objective: Analyze and visualize time series data.
Dataset: Historical Stock Market data (https://github.com/AndrewRPorter/yahoo-historical). With the following stock symbols: ['AAPL', 'AMGN', 'AXP', 'BA', 'BAC', 'BEN', 'BRK-B', 'CAT', 'CSCO', 'CVX', 'CXO', 'DD', 'DIS', 'DOW', 'DUK', 'EMR', 'EXC', 'F', 'FB', 'FDX', 'GE', 'GILD', 'GM', 'GOOG', 'GOOGL', 'GS', 'HD', 'HON', 'IBM', 'INTC', 'JNJ', 'JPM', 'KO', 'LLY', 'LMT', 'MA', 'MCD', 'MMM', 'MRK', 'MSFT', 'MSI', 'NEE', 'NEM', 'NFLX', 'NKE', 'NVDA', 'ORCL', 'OXY', 'PEP', 'PG', 'PM', 'QCOM', 'RTX', 'SBUX', 'SLB', 'SO', 'SPG', 'T', 'TRV', 'UNH', 'UTX', 'V', 'VZ', 'WMT', 'XOM', 'XRAY']
Daily numbers for at least 30 days.
Requirements:

- Display a line chart showing stock prices over time.
- Add a range slider to select specific time frames.
- Include options to toggle between different stocks datasets are used.
- Include an option to add multiple stocks to one chart
- Calculate the RSI and include an option to show the RSI on the chart

Task 3: Interactive Dashboard for Machine Learning Model Insights

Objective: Create a dashboard to display the results of a machine learning model on a dataset of your own choice.
Dataset: Search for a suitable dataset.
Machine Learning Task: Use one supervised and one unsupervised model to discover (new) knowledge or predictions from your dataset.
Requirements
      Create a Plotly Dash Dashboard and visualize your results.

Submission Guidelines:

- Submit the source code of your Dash applications until **15th January 2025**.
- Include a short video (10 Minutes) demonstrating the functionality of your dashboards.
- Provide a brief report (not more than 2 pages) explaining your design choices and insights gained from the visualizations.

Additional Resources for Data:

Kaggle Datasets: https://www.kaggle.com/datasets
Google Dataset Search: https://datasetsearch.research.google.com/
UCI Machine Learning Repository: https://archive.ics.uci.edu/ml/index.php

Note: Ensure you have the necessary permissions to use and distribute the datasets if not publicly available.

Always give credit to the data sources in your reports.