**Data Collection and Preprocessing Phase**

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| Date | 18 June 2025 |
| Team | 178047 |
| Project Title | Unemployed Insurance Beneficiary Forecasting |
| Maximum Marks | 6 Marks |

**Data Exploration and Preprocessing Template**

Identifies data sources, assesses quality issues like missing values and duplicates, and implements resolution plans to ensure accurate and reliable analysis.

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| **Section** | **Description** |
| Data Overview | Calculated dataset shape with df.shape and checked data types and structure using df.info(). Dataset contains monthly records of beneficiaries, benefit amounts, regions, and counties. |
| Univariate Analysis | Used df.describe() and line plots to explore distributions and summary statistics (mean, median, min, max) for variables like 'Beneficiaries' and 'Benefit Amounts (Dollars)'. |
| Bivariate Analysis | Examined relationships between pairs of variables, such as plotting 'Beneficiaries' over time for different counties and comparing beneficiary counts across regions using bar plots. |
| Multivariate Analysis | Generated boxplots for multiple numeric columns to identify patterns, distributions, and outliers across several variables simultaneously. |
| Outliers and Anomalies | Detected outliers using boxplots and summary statistics; treated anomalies by reviewing data points and deciding whether to keep, transform, or remove them as appropriate. |
| **Data Preprocessing Code Screenshots** | |
| Loading Data | uploaded = files.upload() df = pd.read\_csv('unemployment-insurance-beneficiaries-and-benefit-amounts-paid-beginning-2001-1 (1).csv') |
| Handling Missing Data | print(df.isna().sum()) |
| Data Transformation | df.columns = df.columns.str.strip() |
| Feature Engineering | df['Beneficiaries\_diff'] = df['Beneficiaries'].diff() |
| Save Processed Data | df.to\_csv('processed\_unemployment\_data.csv', index=False) |