## **Phase-3 Submission – Data Analytics**

**Student Name:** [Enter Your Name]  
 **Register Number:** [Enter Your Register Number]  
 **Institution:** [Insert College Name]  
 **Department:** [Enter Your Department Name]  
 **Date of Submission:** [Insert Date]  
 **GitHub Repository Link:** [Insert Link to Final Report ]

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### **1. Problem Statement**

* Clearly define the real-world problem you're solving.
* Explain why this business or operational issue matters.
* Specify the analytical approach (Descriptive, Diagnostic, or Exploratory).

### **2. Abstract**

* Summarize the full project in 5–7 lines.
* Include the problem, business context, your approach, and key findings.
* State how your work adds value to decision-making.

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### **3. System Requirements**

* **Hardware**: Minimum RAM (4GB+), CPU (i3 or higher recommended)
* **Software**:  
  + Python 3.x
  + Google Colab /
  + Libraries: pandas, numpy, matplotlib, seaborn, plotly, openpyxl, pandas-profiling
  + Optional: Tableau / Power BI (if dashboard used)

### **4. Project Objectives**

* Define your project’s specific objectives.
* List expected outputs such as business insights, trends, or data-driven strategies.
* Link objectives to business impact and decision-making.

### **5. Project Workflow (Flowchart)**

* Show your analytical workflow:

Data Collection → Data Cleaning → EDA → Insight Generation → Visualization → Recommendations

* Insert a visual flowchart created using:  
  + draw.io / Canva / PowerPoint / Lucidchart / Figma
* Add the flowchart image or screenshot in your final document.

**6. Dataset Description**

* Dataset Name and Source (e.g., Kaggle, UCI, API, Company DB)
* Data Type: Structured / Unstructured
* Size: No. of records and features
* Include a df.head() screenshot to show sample records
* Mention static or dynamic nature

### **7. Data Preprocessing**

* Handling missing values, duplicates
* Converting data types, formatting dates/currency fields
* Encoding categorical variables (if used for grouping/aggregation)
* Outlier handling (if needed for analysis)
* Show before & after transformation code or screenshots

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### **8. Exploratory Data Analysis (EDA)**

* Univariate Analysis: distribution plots, count plots
* Bivariate/Multivariate: correlation heatmaps, scatter plots, group comparisons
* Use tools like seaborn, matplotlib, plotly
* Include 3–4 charts or graphs with clear interpretation
* List 5–6 insights discovered from EDA

**9. Insights and Interpretation**

* Convert your EDA findings into meaningful business insights
* Support with visuals or comparative summaries
* Use bullet points to highlight each key takeaway
* Example:  
  + “Customers aged 45+ contribute 60% of premium product sales.”
  + “Sales in Q4 show a 35% spike compared to Q1.”

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### **10. Recommendations**

* Provide practical, data-backed suggestions to stakeholders
* Separate into:  
  + Short-Term Actions
  + Long-Term Strategic Moves
* Clearly link each recommendation to your insights

### **11. Visualizations / Dashboard**

* Provide:  
  + Key charts from Matplotlib/Seaborn/Plotly
  + Screenshots or links to Tableau / Power BI dashboards (if applicable)
  + GIF or screenshot of interactive dashboards (optional)
* Explain what each visualization shows and why it matters

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### **12. Final Deliverables**

* Final Jupyter/Colab Notebook (cleaned and well-commented)
* Dashboard file or link (Power BI/Tableau/Plotly Dash)
* Final Report (PDF/DOC format)
* Insight Summary Sheet (optional)

**13. Source Code**

* Upload your final .ipynb / .py files to GitHub
* Include all scripts for preprocessing, visualization, and dashboarding
* Link notebook(s) in the report

Folder structure example:  
  
  
├── data/

├── notebooks/

├── dashboard/

├── report/

└── README.md

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### **14. Future Scope**

* Suggest at least 2–3 areas for improvement or extension:  
  + Real-time data pipeline integration
  + Advanced visualization tools (D3.js, Power BI automation)
  + Adding NLP sentiment analysis on reviews
  + Connecting insights to marketing automation or CRM actions

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### **15. Team Members and Roles**

| **Name** | **Responsibility** |
| --- | --- |
| [Student 1 Name] | Task 1 |
| [Student 2 Name] | Task 2 |
| [Student 3 Name] | Task 3 |