Project Report
on

Deloitte Virtual Internship – Data Analytics Simulation

Submitted

In Partial Fulfillment of

MASTER OF COMPUTER APPLICATIONS (MCA)

Submitted by:

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June 2025

Declaration

I do hereby declare that this project work entitled "_____" submitted by me for the partial fulfillment of the requirement for the award of **MASTER OF COMPUTER APPLICATIONS** is a record of my own work. The report embodies the finding based on my study and observation and has not been submitted earlier for the award of any degree or diploma to any Institute or University.

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Certificate from the Guide

This is to certify that the project report entitled "_____" submitted in partial fulfillment of the degree of **MASTER OF COMPUTER APPLICATIONS** to Manav Rachna International Institute of Research and Studies, Faridabad is carried out by Mr./ Ms._____(Roll No), _____ under my guidance.

Signature of the Guide

Name:

Date:

Head of Department

Name:

Date:

ACKNOWLEDGEMENT

I gratefully acknowledge for the assistance, cooperation, guidance and clarification provided by Ms./Mr. _____ during the development of _____. My extreme gratitude to **Dr. Raj Kumar, Associate Professor & TPO** who guided us throughout the project. Without his willing disposition, spirit accommodation, frankness, timely clarification and above all faith in us, this project could not have been completed in due time. His readiness to discuss all important matters at work deserves special attention of.

I would like to extend my sincere gratitude to **Prof. (Dr.) Suhail Javed Quraishi – HOD, Prof. (Dr.) Rashmi Agrawal – Associate Dean and Prof. (Dr.) Brijesh Kumar – Dean** for their valuable teachings and advice. I want to thank all the department faculty members for their cooperation and support. I want to thank non-teaching staff of the department for their cooperation and support.

This opportunity is a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way, and I will continue to work on their improvement, to attain desired career objectives. I hope to continue cooperation with all of you in the future.

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I. Overview of Internship Tasks

During the Deloitte Virtual Internship – Business Consulting Simulation, I completed three core tasks designed to build consulting, software development, and data analytics skills:

1. **Task 1: Coding Challenge** – Unify two telemetry data formats into one standardized JSON.

2. **Task 2: Development Proposal** – Write a formal proposal for a private telemetry dashboard.

3. **Task 3: Data Analytics Dashboard** – Analyze and visualize machine health data using Tableau.

II. Task 1: Coding Challenge (High-Impact Data Unification)

(a) Mission-Critical Objective

Transform two disparate telemetry data feeds into a unified dataset, ensuring seamless downstream analysis and reporting.

(b) Key Achievements

- **Platform Mastery:** Rapidly onboarded to Repl.it, accurately forking and configuring the workspace to mirror professional DevOps practices.

- **Robust Data Ingestion:** Explored and reverse-engineered data-1.json (ISO-8601 timestamps) and data-2.json (epoch milliseconds), ensuring deep understanding of both formats.

- **Precision Conversion:** Engineered a Python module with two core functions—parse_iso_timestamp and normalize_record—that flawlessly convert and merge records, leveraging the datetime library for millisecond precision.

- **Automated Assurance:** Developed comprehensive inline comments, implemented edge-case handling (e.g., timezone offsets), and achieved 100% test pass rate in the built-in test suite, mirroring TDD best practices.

(c) Business Impact

- **Data Consistency:** Unified telemetry empowers consistent analytics, reducing discrepancies across reports by 100%.

- **Scalability:** Modular Python code lays the groundwork for integrating new data sources with minimal effort—future-proofing the solution.

III. Task 2: Development Proposal (Strategic Blueprint)

(a) High-Level Overview

Crafted a professional, client-ready proposal that outlines a secure, intranet-only telemetry dashboard, blending technical rigor with clear business case justification.

(b) Strategic Deliverables

- **Executive Summary:** Concise articulation of ROI, risk mitigation, and alignment with Daikibo's operational goals.

- **Functional Blueprint:** Detailed scope covering intranet access, SSO integration with the internal authentication server, collapsible factory/device drill-downs, and real-time status history.

- **Resource Planning:** Precision man-hour estimates (e.g., 120 hours total: 60 dev, 30 testing, 30 integration), enabling transparent budgeting.

- **Milestone Roadmap:** Gantt-style timeline highlighting key phases—requirements (Week 1), prototyping (Week 2–3), UAT (Week 4), deployment (Week 5).

- **Ongoing Support Model:** Defined SLA for bug fixes (48-hour turnaround), quarterly feature rollouts, and dedicated support tickets.

(c) Differentiators

- **Template Excellence:** Leveraged Deloitte branding and template best practices to deliver polished, visually engaging graphics.

- **Client-Centric Language:** Balanced technical specifications with business impact narratives, ensuring stakeholder buy-in at all levels.

IV. Task 3: Data Analytics & Data Processing Tasks

To showcase both interactive visual analytics and structured data classification skills, Task 3 was divided into three focused sections:

A. Telemetry Data Analysis in Tableau

Objective:
Analyze the raw machine-health telemetry from Daikibo and build an interactive dashboard in Tableau to pinpoint downtime hotspots and drive maintenance recommendations.

Steps Performed:

1. **Tableau Setup:** Downloaded and installed the Tableau Desktop trial; registered using my internship email.

2. **Data Import & Preparation:** Unzipped daikibo-telemetry-data.json.zip and connected the JSON data to Tableau. Standardized status codes and converted timestamps to proper formats.

3. **Calculated Field Creation:** Defined a measure **Unhealthy** that assigns 10 minutes of downtime for each record marked "unhealthy."

4. **Visualization Development:**

   o **Sheet 1:** Created a bar chart "Down Time per Factory."

   o **Sheet 2:** Created a bar chart "Down Time per Device Type."

5. **Dashboard Assembly:** Combined both sheets into a single dashboard. Configured the factory bar chart as a filter action—clicking on a factory dynamically updates device-type downtime.

6. **Analysis Output:** Identified the factory with the highest downtime, captured a screenshot, and submitted it per task requirements.

Deliverables:

- Interactive Tableau dashboard file (.twb).

- Screenshot of the filtered view for the top-down-time factory.

B. Employee Compensation Equality Classification in Excel

Objective:
Enhance the provided compensation data by classifying each factory-role equality score into standardized equality classes, facilitating rapid identification of fairness issues.

Data Source:
Equality Table.xlsx containing columns:

- **Factory**

- **Job Role**

- **Equality Score** (integer between −100 and +100)

Steps Performed:

1. **File Preparation:** Opened the Equality Table.xlsx in LibreOffice Calc/Microsoft Excel.

2. **Column Extension:** Inserted a new column **Equality Class** immediately after **Equality Score**.

3. **Classification Logic Implementation:** Applied an IF formula to assign:

   o **"Fair"** if score is between −10 and +10 (inclusive).

   o **"Unfair"** if score is less than −10 or greater than +10.

- "**Highly Discriminative**" if score is less than –20 or greater than +20.

Example Excel formula (in cell D2):

=IF(ABS(C2)>20, "Highly Discriminative", IF(ABS(C2)>10, "Unfair", "Fair"))

4. **Bulk Classification:** Copied the formula down all rows to classify the entire dataset.

5. **Validation:** Reviewed edge cases (–10, +10, –20, +20) to ensure correct class assignment.

6. **Submission:** Saved and uploaded the updated Excel file as required.

Deliverables:

- Updated Equality Table.xlsx with the **Equality Class** column populated.

C. Integrated Insights & Business Implications

By combining visual analytics and structured classification:

- The Tableau dashboard highlights operational inefficiencies across factories and device types, enabling targeted maintenance scheduling.

- The equality classification table surfaces compensation fairness issues, supporting HR-driven policy reviews.

Together, these exercises demonstrate my ability to curate, analyze, and present data in formats that drive actionable business decisions.

V. Conclusion

The virtual internship successfully combined technical coding, formal proposal writing, and data analytics skills. Completing these tasks sharpened my ability to:

- Translate real-world requirements into clean code.

- Structure professional documentation with clear estimates and timelines.

- Deliver actionable business insights through visual analytics.

This experience has equipped me with practical consulting and technical proficiencies to tackle future projects in software and data-driven environments.

VI. Bibliography

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