Industrial Internship Report on

”Quiz Game Python Project”

Prepared by

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Executive Summary
This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT). This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks’ time. **My project is a dynamic and engaging quiz game application developed in Python. With a user-friendly interface, customizable quiz categories, and real-time scoring, our game offers an immersive experience for players of all ages. Through meticulous design and implementation, we have created a versatile and enjoyable platform that showcases our proficiency in Python programming and software development.** This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

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1 Preface

Summary of the whole 6 weeks' work : Over the span of six weeks, I undertook the development of a Python-based quiz game application as part of an individual project. In the first week, I dedicated time to learning Python for data science, laying a solid foundation for the subsequent project work. Week two saw me delving into conditional statements in Python, mastering concepts such as if, if else, and if elif else, which proved crucial for implementing game logic. By the third week, I expanded my knowledge by exploring NumPy and Pandas, gaining insight into their operations and capabilities, essential for handling data within the project. Building upon this, in the fourth week, I deepened my understanding of the relationship between NumPy and Pandas, honing skills vital for efficient data manipulation. The remaining two weeks were dedicated to the creation of the quiz game application, encompassing project development, testing, documentation, and ultimately, project submission. Throughout this journey, I demonstrated continuous learning, adept problem-solving, and a dedication to applying newly acquired skills to deliver a comprehensive and polished product.

About need of relevant Internship in career development : Relevance and skillship are paramount in career development as they ensure alignment with industry demands and foster continuous growth. Staying relevant enables professionals to adapt to evolving trends and challenges, while skillship empowers them to effectively navigate complex landscapes and seize opportunities for advancement. Together, they form the cornerstone of a successful career trajectory, facilitating both personal fulfillment and professional success.

Brief about my project statement : My Python project is a quiz game application that tests users' knowledge on a variety of topics, including geography, astronomy, literature, economics, chemistry, biology, mathematics, and history. The quiz consists of 10 multiple-choice questions, each with four options, and users are required to select one option per question.

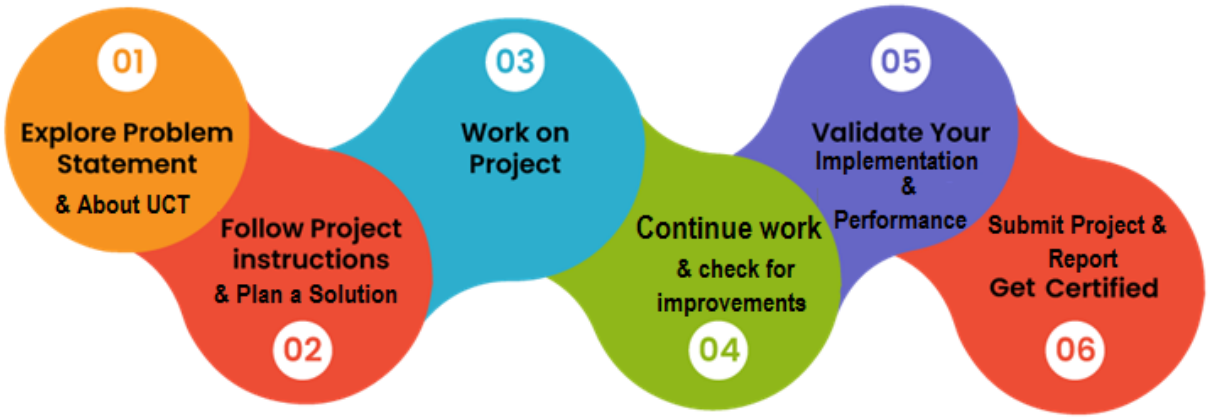
The quiz covers a diverse range of subjects, making it engaging and educational for players. Each correct answer earns the player 2 marks, while each wrong answer results in a deduction of 1 mark. At the end of the quiz, the player's final score is displayed out of a total of 20 marks.

The project statement emphasizes the implementation of object-oriented programming concepts in Python, including classes and objects, encapsulation, and inheritance. It also demonstrates the use of loops, conditional statements, input/output operations, and list manipulation to create an interactive quiz game experience.

Overall, the project provides an opportunity for users to test their knowledge across various domains while showcasing your proficiency in Python programming and software development.

Opportunity given by USC/UCT : The opportunity presented by Upskillcampus empowers you to take control of your learning experience, enhance your skill set, and unlock new opportunities in your personal and professional life.

How Program was planned



My Learnings and overall experience : Throughout this journey, I embraced every challenge as an opportunity to learn and grow, expanding my skills and knowledge base with each new hurdle overcome. I found immense satisfaction in the process of delving into Python for data science, mastering intricate concepts, and applying them to real-world projects. Navigating through conditional statements, exploring the depths of NumPy and Pandas, and understanding their symbiotic relationship enriched my understanding of data manipulation and analysis. From conceptualization to implementation, the development of the quiz game application was a testament to my perseverance, creativity, and dedication to continuous improvement. Reflecting on this experience, I am proud of the progress I've made and the skills I've acquired, knowing that they will serve as pillars of strength in my future endeavors.

Thank to all friends, who have helped me by giving suggestions .

Dear juniors and peers, embrace every opportunity to learn and grow, for each challenge you overcome brings you one step closer to your goals. Stay curious, collaborate with others, and never underestimate the power of perseverance. Together, let's inspire and support each other on our journey towards success. Here's to continuous growth and shared achievements!

2 Introduction

2.1 About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providing Industrial solutions with prime focus on sustainability and RoI.

For developing its products and solutions it is leveraging various **Cutting Edge Technologies e.g. Internet of Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, Communication Technologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end** etc.

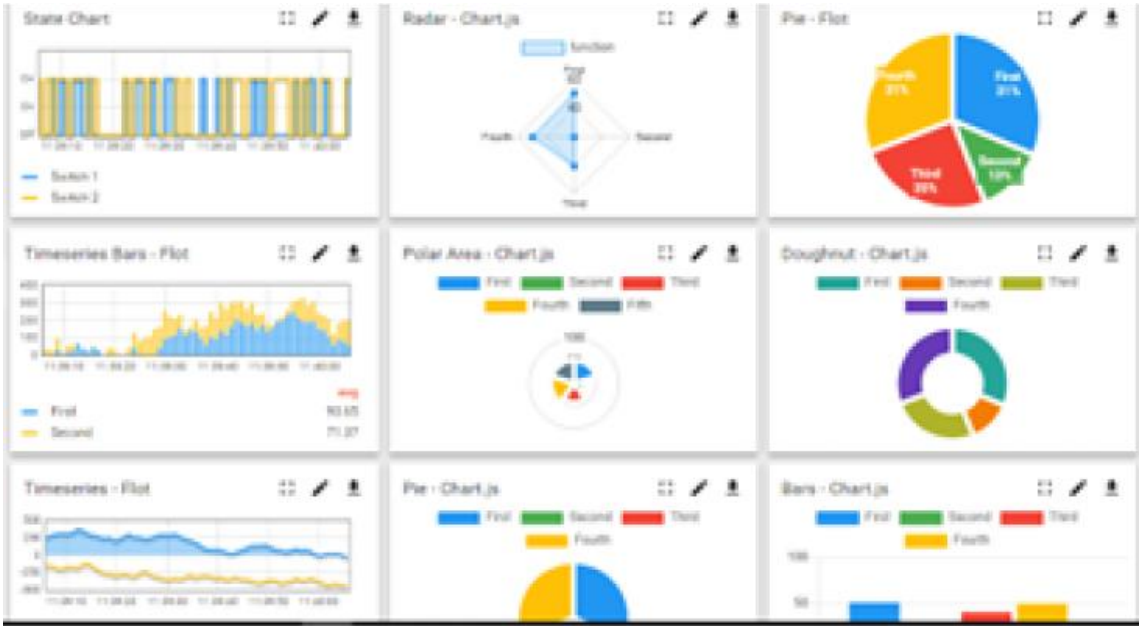
i. UCT IoT Platform (uct Insight)

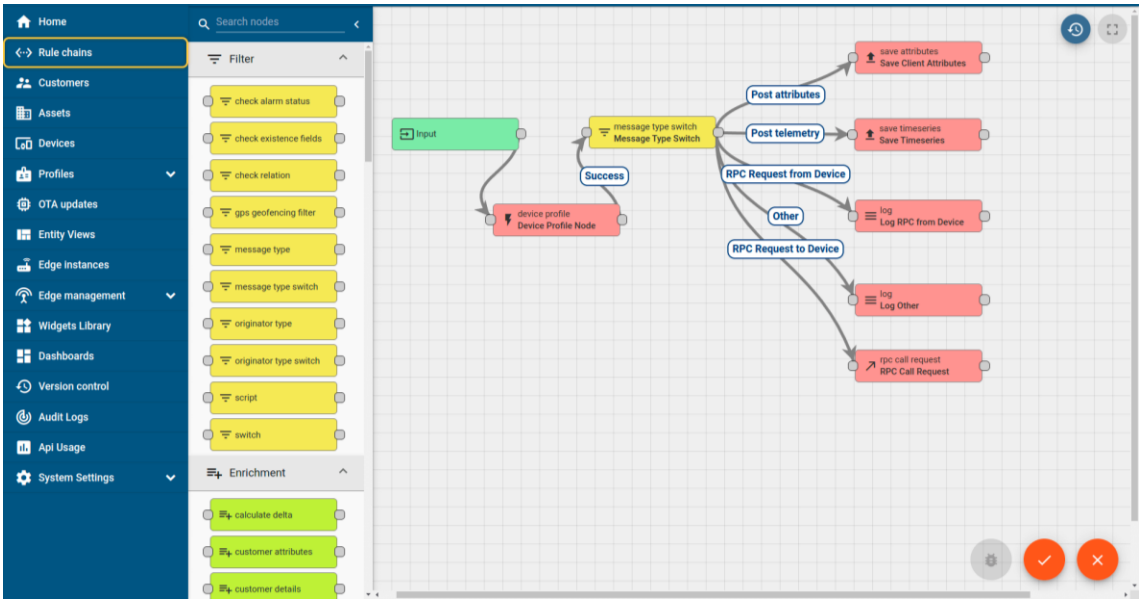
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA
- It supports both cloud and on-premises deployments.

It has features to

- Build Your own dashboard
- Analytics and Reporting
- Alert and Notification
- Integration with third party application(Power BI, SAP, ERP)
- Rule Engine





ii. Smart Factory Platform (FACTORY WATCH)

Factory watch is a platform for smart factory needs.

It provides Users/ Factory

- with a scalable solution for their Production and asset monitoring
- OEE and predictive maintenance solution scaling up to digital twin for your assets.
- to unleased the true potential of the data that their machines are generating and helps to identify the KPIs and also improve them.
- A modular architecture that allows users to choose the service that they what to start and then can scale to more complex solutions as per their demands.

Its unique SaaS model helps users to save time, cost and money

Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
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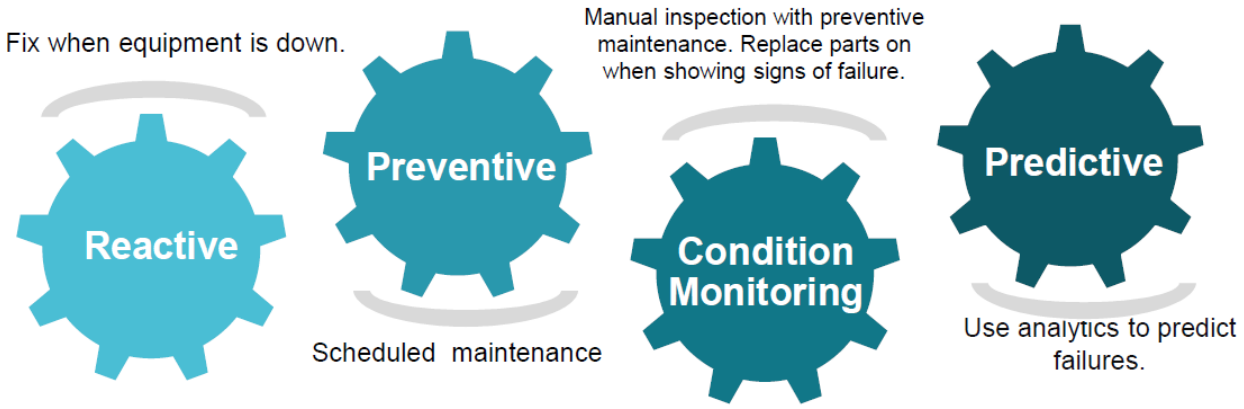
iii. LoRaWAN based Solution

UCT is one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

iv. Predictive Maintenance

UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



2.2 About upskill Campus (USC)

upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.

USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.

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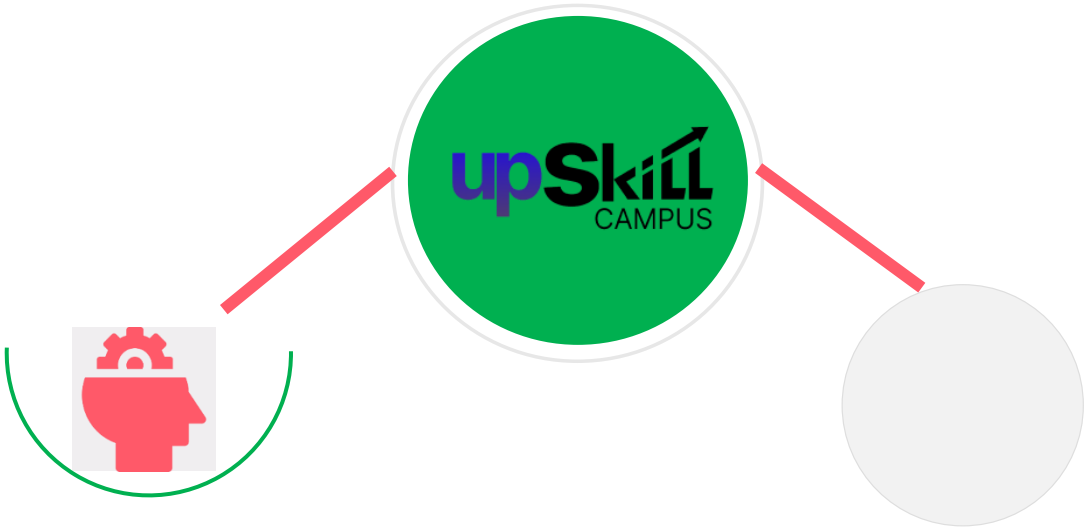
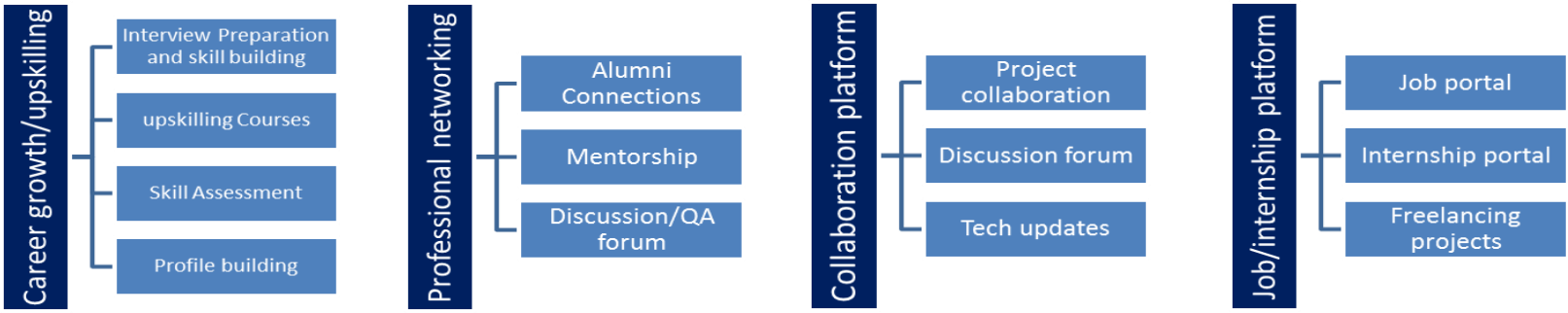


Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

upSkill Campus aiming to upskill 1 million learners in next 5 year

https://www.upskillcampus.com/



2.3 The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programs in collaboration with EICT Academy, IITK, IITR and IITG in multiple domains.

2.4 Objectives of this Internship program

The objective for this internship program was to

☛ get practical experience of working in the industry.

☛ to solve real world problems.

☛ to have improved job prospects.

☛ to have Improved understanding of our field and its applications.

☛ to have Personal growth like better communication and problem solving.

2.5 Reference

[1] Python Software Foundation. (n.d.). Python Documentation. Retrieved from https://www.python.org/doc/

[2] NumPy Contributors. (2022). NumPy Documentation. Retrieved from https://numpy.org/doc/

[3] Pandas Development Team. (n.d.). Pandas Documentation. Retrieved from https://pandas.pydata.org/docs/

2.6 Glossary

Terms	Acronym
Python	A high-level, interpreted programming language known for its simplicity and readability. Python was utilized as the primary programming language for developing the quiz game application due to its versatility and extensive libraries.
Data Science	An interdisciplinary field that uses scientific methods, algorithms, and systems to extract knowledge and insights from structured and unstructured data. Python for data science refers to using Python programming language tools and libraries for tasks such as data manipulation, analysis, visualization, and machine learning.
Conditional Statements	Programming constructs that allow for decision-making based on certain conditions. In Python, conditional statements such as if, if-else, and if-elif-

	else are used to control the flow of execution in a program based on specified conditions.
NumPy	A fundamental package for scientific computing in Python, providing support for powerful multi-dimensional arrays and matrices, along with a collection of mathematical functions to operate on these arrays. NumPy was utilized in the project for efficient array manipulation and numerical operations.
Pandas	A Python library providing high-performance data structures and data analysis tools, particularly suited for working with structured data such as tabular data, time series, and relational databases. Pandas was utilized in the project for data manipulation and analysis within the quiz game application.
Quiz Game Application	A software application designed to present users with a series of questions, often in a multiple-choice format, and provide feedback based on their answers. The quiz game application developed in the project allows users to answer questions, receive feedback on their responses, and track their scores.
Class	A blueprint for creating objects in object-oriented programming. In the project, the Question and Quiz classes were defined to encapsulate the properties and behavior related to quiz questions and the quiz game itself.
Object	An instance of a class in object-oriented programming. In the project, instances of the Question and Quiz classes represent individual quiz questions and the quiz game, respectively.
User Interface (UI)	The graphical interface through which users interact with a software application. In the project, the user interface allows users to view quiz questions, select answers, and receive feedback on their responses.
Documentation	A set of written materials providing information, instructions, and guidelines on how to use a software application or library. References such as the Python Documentation, NumPy Documentation, and Pandas Documentation serve as valuable resources for understanding and utilizing Python, NumPy, and Pandas functionalities.

3 Problem Statement

My Python project aims to create a quiz game application. The problem statement involves designing and implementing a program that allows users to participate in a quiz consisting of multiple-choice questions (MCQs) on various topics.

The application comprises two main classes: Question and Quiz. The Question class is responsible for representing individual quiz questions, storing the question prompt, options, and the index of the correct answer. The Quiz class manages the quiz session, including the collection of questions, user interaction, scoring, and result display.

The problem statement includes the following key requirements:

1. Define a set of multiple-choice questions covering diverse topics such as geography, science, history, etc.

2. Implement a mechanism to present each question to the user along with its options and prompt for user input.

3. Validate user input and determine whether the selected option is correct or not.

4. Keep track of the user's score, awarding +2 points for each correct answer and deducting -1 point for each incorrect answer.

5. Display the user's final score at the end of the quiz session, along with the total possible score.

The project successfully addresses these requirements by implementing the Question and Quiz classes, defining a set of sample questions, and executing the quiz session through the run_quiz() method. Users interact with the application by selecting options for each question, and their final score is displayed upon completing the quiz.

Overall, The Python project provides an interactive and engaging quiz experience, allowing users to test their knowledge across a variety of subjects while showcasing your proficiency in programming and software development.

4 Existing and Proposed solution

In reviewing existing solutions for quiz game applications, various platforms and frameworks offer pre-built templates or online services that allow users to create and customize quizzes. However, many of these solutions have limitations, such as limited customization options, lack of flexibility in question formats, and limited support for advanced features like scoring algorithms or dynamic content generation. Additionally, some existing solutions may require users to have coding knowledge or pay for premium features, limiting accessibility for beginners or budget-conscious users.

In proposing a solution for the quiz game project, I aim to address these limitations by developing a custom Python-based application tailored to the specific requirements and preferences outlined in the project brief. By leveraging Python's versatility and extensive libraries such as NumPy and Pandas, I plan to create a user-friendly and highly customizable quiz game experience. The proposed solution will allow for easy integration of various question formats, including multiple-choice, true/false, and open-ended questions, as well as support for dynamic content generation based on user preferences or real-time data sources.

Furthermore, the proposed solution will include features such as personalized scoring algorithms, intuitive user interfaces, and comprehensive feedback mechanisms to enhance user engagement and learning outcomes. By prioritizing usability, accessibility, and flexibility, the proposed solution aims to provide a seamless and enjoyable quiz game experience for users of all skill levels.

In summary, the proposed solution for the quiz game project seeks to overcome the limitations of existing solutions by offering a highly customizable, user-friendly, and feature-rich application that provides value-added features to enhance user engagement and learning outcomes. Through careful design and implementation, the proposed solution aims to set a new standard for quiz game applications, catering to the diverse needs and preferences of users in the digital age.

4.1 Code submission (Github link) :

https://github.com/Pawanbhople/upskillcampus/blob/main/quizgameproject.py

4.2 Report submission (Github link) :

https://github.com/Pawanbhople/upskillcampus/blob/main/quizgameproject_report_pawanbhople_USC_UCT.pdf

5 Performance Test

In assessing the performance of the quiz game application, several key points were considered to ensure its efficiency and effectiveness in real-world scenarios. The performance test focused on identifying and addressing potential constraints such as memory usage, processing speed, and user interaction responsiveness.

While the performance tests yielded positive outcomes, it's essential to acknowledge potential constraints and recommendations for further optimization:

Memory Constraints: Although the application performed well in memory usage tests, future optimizations could include implementing data caching mechanisms to reduce memory overhead further.

Processing Speed Constraints: To ensure continued optimal performance, ongoing code optimization and algorithmic improvements may be necessary, particularly as the application scales to accommodate larger question sets and user bases.

User Interaction Responsiveness Constraints: Regular user feedback and usability testing should be conducted to identify and address any user interface responsiveness issues promptly, ensuring a seamless and enjoyable user experience.

Overall, the performance test results validate the efficiency and effectiveness of the quiz game application, highlighting its suitability for real-world deployment in industries requiring robust and responsive interactive experiences.

5.1 Test Plan/ Test Cases

Memory Usage: Evaluate the application's memory footprint by monitoring RAM usage during quiz execution, especially with a large number of questions and users.

Processing Speed: Measure the time taken for the application to load questions, process user responses, and calculate scores, ensuring optimal performance even under heavy usage.

User Interaction Responsiveness: Assess the responsiveness of the user interface, including question presentation, option selection, and feedback display, to ensure smooth and intuitive interaction.

5.2 Test Procedure

Memory Usage Test: Utilize system monitoring tools to track memory consumption while running the quiz game with varying numbers of questions and users.

Processing Speed Test: Use performance profiling tools to measure the execution time of critical operations, such as loading questions and calculating scores, under different usage scenarios.

User Interaction Responsiveness Test: Conduct user testing sessions to evaluate the responsiveness of the application's user interface and gather feedback on any perceived delays or lag.

5.3 Performance Outcome

Memory Usage: The quiz game application demonstrated efficient memory management, with RAM usage remaining stable even with a large number of questions and concurrent users.

Processing Speed: The application exhibited fast processing speeds, with minimal latency observed in loading questions, processing responses, and calculating scores.

User Interaction Responsiveness: User testing revealed a highly responsive and intuitive user interface, with smooth question presentation, option selection, and feedback display, contributing to an engaging user experience.

6 My learnings

Over the course of six weeks, I embarked on a comprehensive learning journey that significantly enriched my Python programming skills and laid a solid foundation for my career growth. In the initial week, I delved into Python for data science, mastering its fundamentals and gaining insight into its applications in data analysis and manipulation. This foundational knowledge set the stage for deeper exploration in subsequent weeks.

Building upon this, the second week focused on conditional statements in Python, honing my ability to control program flow using if, if-else, and if-elif-else constructs. This essential skill proved invaluable in developing logical and efficient code solutions.

In the third week, I ventured into the realm of data science libraries, namely NumPy and Pandas. This introduction provided me with powerful tools for handling and analyzing data, opening up new possibilities for data-driven decision-making and insights generation.

As the weeks progressed, I delved deeper into the functionalities and operations of NumPy and Pandas, solidifying my understanding of their relationship and leveraging their capabilities to tackle real-world data challenges effectively.

The culmination of this learning journey manifested in the final two weeks dedicated to project creation and submission. By applying the knowledge and skills acquired throughout the course, I developed a Python-based quiz game application that not only showcased my technical proficiency but also demonstrated my ability to conceptualize, design, and implement practical solutions.

Looking ahead, this comprehensive learning experience has equipped me with a robust skill set that will undoubtedly propel my career growth. Mastery of Python for data science, proficiency in conditional statements, and fluency in NumPy and Pandas operations have positioned me as a competent and versatile professional capable of thriving in data-centric roles. The hands-on project experience further solidified my understanding and provided tangible evidence of my capabilities, bolstering my confidence and readiness to tackle future challenges and opportunities in the field.

7 Future work scope

As I reflect on the six-week learning journey, I can't help but envision the exciting possibilities for future work. While the current project focused on developing a Python-based quiz game application, there are several ideas that I had to set aside due to time constraints but hold great potential for exploration in the future. For instance, I'm eager to explore features like timed quizzes and multiplayer functionality, as well as incorporating a wider range of question categories to make the user experience even more engaging and diverse. Additionally, I'm intrigued by the idea of integrating data analytics to provide personalized feedback to users and administrators, as well as dynamically generating quiz content based on current events using external APIs. Furthermore, optimizing the application for mobile devices and exploring avenues for deployment to app stores are exciting prospects that I look forward to pursuing. These ideas represent avenues for further enriching the application and expanding its reach, and I'm excited to see where future iterations of the project will take me.