Industrial Internship Report on
"Quiz Game"
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 was Quiz Game using python. The program presents a series of questions with options to the user. The user selects an answer or inputs their response. The program checks if the answer is correct and updates the score accordingly. Feedback on the correctness of the answer is provided to the user. The process repeats until all questions are answered, and the final score is displayed.

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:

During the first week of the internship, I selected the Quiz game project as my focus. I researched and identified the key components and requirements for the project.

In the second week, I proposed a design for the Quiz game. This included outliningthe architecture, database structure, and user interface. I also created pseudo code to help guide the implementation process.

Moving into the third week, I started implementing the design. I began by setting up the necessary frameworks and libraries.

Continuing into the fourth week, I focused on further implementing the design.I worked on improving the user interface and enhancing the user experience.

By the fifth week, I shifted my attention towards checking the correctness of the quiz game. I conducted tests to evaluate the speed and efficiency of the system. Ioptimized the code and made any necessary improvements to enhance the performance.

During the final week of the internship,I compiled all the documentation and completed the final report, including a summary of the project, its implementation, and any recommendations or future enhancements.

At the end of the internship, I submitted the final report, showcasing the progress made throughout the six weeks and providing a comprehensive overview of the URL shortener project.

About need of relevant Internship in career development:

Relevant internships play a crucial role in career development for several reasons:

1. Practical Experience: Internships provide an opportunity to gain practical, hands-on experience in a specific field or industry. They allow you to apply the theoretical knowledge you've acquired in a real-world setting, helping you develop a deeper understanding of the work involved and the skills required.

2. Skill Development: Internships offer a platform to enhance and develop valuable skills that are relevant to your desired career path. You can learn industry-specific tools,technologies, and best practices, as well as develop transferable skills such as communication, teamwork, problem-solving, and time management.

3. Industry Exposure: Internships provide an insider's view of the industry or profession you're interested in. You can gain exposure to the day-to-day operations, company culture, and industry trends. This exposure helps you make informed decisions about your career path and can guide your future choices.

4. Networking Opportunities: Internships allow you to connect and network with professionals in your chosen field. Building relationships with mentors, colleagues, and industry experts can open doors to future job opportunities and provide valuable guidance and advice.

5. Resume Building: Having relevant internship experience on your resume demonstrates to potential employers that you have practical experience in the field andare proactive in your professional development. It can make your resume stand out andincrease your chances of securing future employment.

6. Clarifying Career Goals: Internships can help you explore different areas within a specific field, giving you a clearer understanding of your interests and strengths. They allow you to test the waters and gain insight into whether a particular career path alignswith your goals and aspirations.

Overall, relevant internships provide a valuable platform for career development by offering practical experience, skill development, industry exposure, networking opportunities, resume building, clarity of career goals, and professional growth. Theyserve as a bridge between academic learning and professional employment, allowingyou to make informed decisions about your future career path.

Brief about Your project/problem statement:

To implement a quiz game using Python, you can follow these steps:

Define Quiz Questions: Decide on the format of your quiz questions (e.g., multiple-choice, true/false, fill in the blanks). Create a data structure to store the questions, options (if multiple-choice), and correct answers. This could be a list of tuples, a dictionary, or any other suitable data structure.

User Interaction: Use the input() function to prompt the user with questions and receive their answers. Depending on the question format, you may need to display options or ask for free-form input.

Scoring: Keep track of the user's score as they answer questions. Increment the score when the user answers correctly.

Feedback: Provide feedback to the user after each question, indicating whether their answer was correct or incorrect. If the answer is incorrect, display the correct answer.

End of Game: Determine when the quiz should end, whether it's after a certain number of questions or until the user decides to quit. Display the user's final score at the end of the quiz.

Opportunity given by USC/UCT:

Upskill Campus (USC) or The IoT Academy in collaboration with UniConverge Technologies Pvt Ltd (UCT) as of my knowledge cutoff in September 2021, internshipsand collaborations with industry partners generally offer valuable opportunities for professional growth and development.

Participating in an internship or collaboration program with USC/UCT could provide thefollowing opportunities:

1. Industry Exposure: Working with a renowned institution and industry partner givesyou exposure to real-world industrial problems, challenges, and practices

2. Practical Experience: Internships and collaborations offer hands-on experience,enabling you to apply your knowledge and skills in a practical setting. Working on projects or problem statements provided by industry partners helps bridge the gap between theory and practice, proficiency in your chosen field.

3. Networking: Collaborating with USC, UCT, and their industry partner gives you the opportunity to build a professional network. You can connect with professionals, mentors, and experts in the industry, which can lead to future job prospects, references, and valuable connections.

4. Skill Development: Engaging in projects and problem-solving within the context of an internship or collaboration provides an avenue for skill development.

How Program was planned:
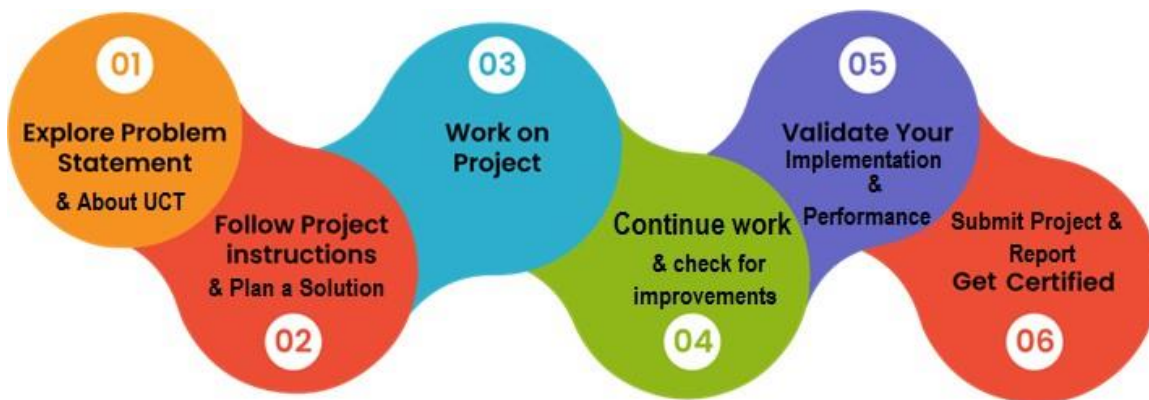
Learnings and overall experience:

Learnings and overall experience you might expect from working on Quiz game project during a Python internship.

1. Technical Skills: Working on a Quiz game project in Python allows you toenhance your technical skills in various areas. You'll gain proficiency in Python programming.

2. Problem-Solving: Throughout the project, you'll enhance yourproblem-solving skills by identifying and implementing effective solutions to these challenges.

3. Project Management: Participating in an internship project involves managing your time and tasks effectively. You'll gain experience in project planning, task prioritization, and meeting deadlines.

4. Debugging and Testing: During the implementation phase, you'll encounter and overcome challenges through debugging and testing. This process will enhance your troubleshooting skills and help you develop strategies for identifying and resolving issuesin your code.

5. Exposure to Industry Practices: Internships often provide exposure to industry practices and standards. You may learn about coding conventions, version control systems (such as Git), code documentation, and collaborative development workflows.These experiences will help you align your skills and practices with industry expectations.

Overall, working on a Quiz game project during a Python internship offers a valuableopportunity to apply your programming knowledge to a practical, real-world scenario. It enables you to develop technical skills, problem-solving abilities, project management capabilities, and an understanding of industry practices.

Thanks to Upskill Campus (USC) or The IoT Academy in collaboration with UniConverge Technologies Pvt Ltd (UCT) for this Internship Oppurtinity.

2   Introduction

2.1   About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providingIndustrial 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, Frontend** etc.

i.   UCT IoT Platform (uct Insight)

UCT Insight is an IOT platform designed for quick deployment of IOT applications on the sametime providing valuable "insight" for your process/business. It has been built in Java for backendand 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
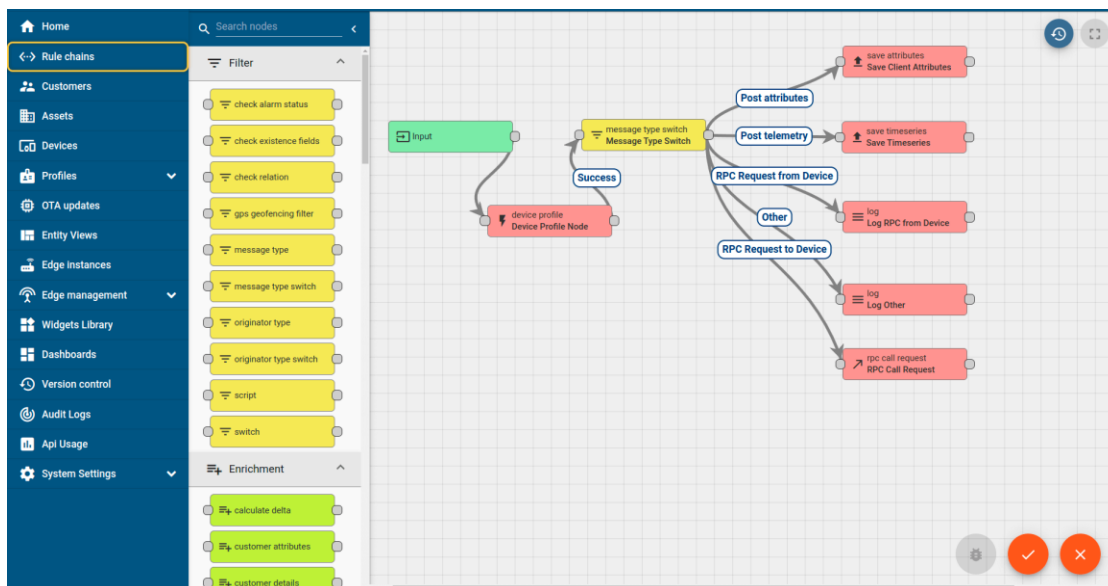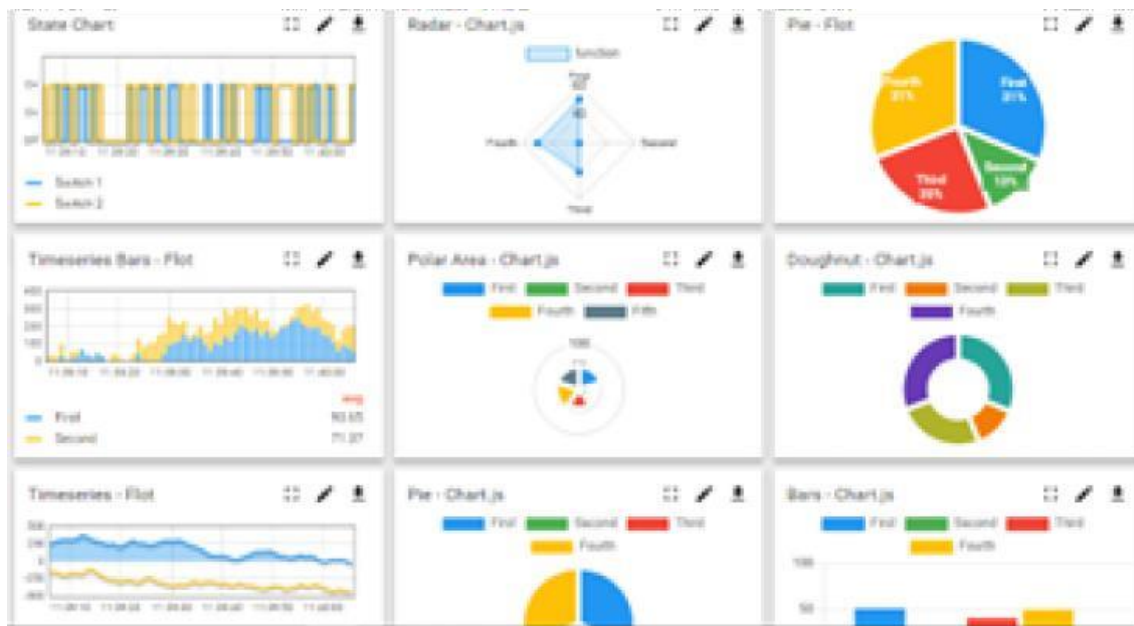
ii. Smart Factory Platform (**FACT⬮RY WATCH**)

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 toidentify the KPIs and also improve them.

- A modular architecture that allows users to choose the service that they what to start andthen 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
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i

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 findingRemaining useful life time of various Machines used in production process.
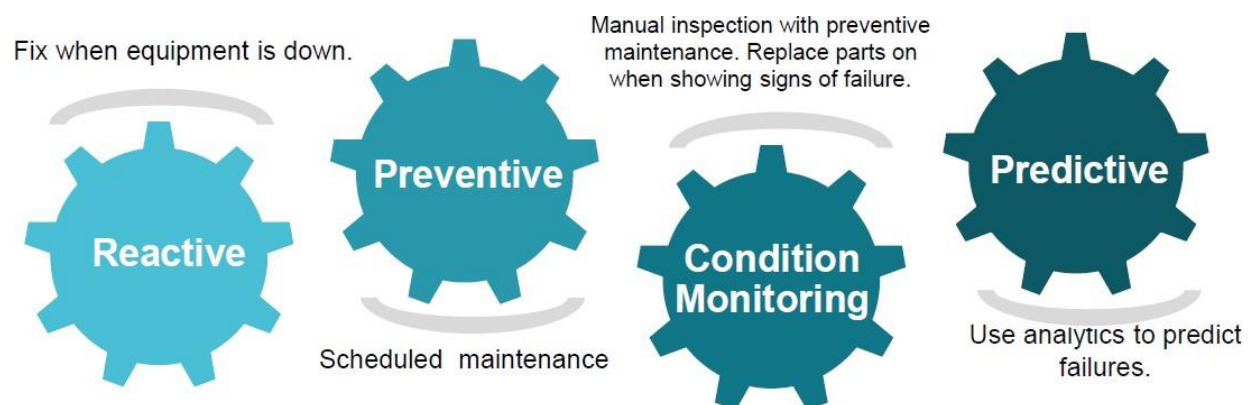
2.2 About upskill Campus (USC)

Upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.
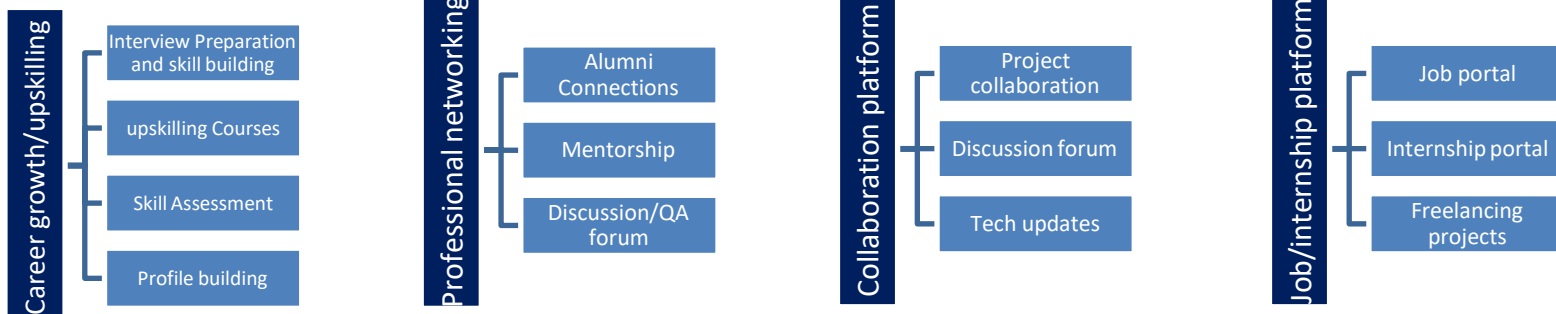
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.

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

upSkill Campus aimingto upskill 1 million learners in next 5 year

https://www.upskillcampus.com/

Career growth/upskilling		Professional networking		Collaboration platform		Job/internship platform	
	Interview Preparation and skill building		Alumni Connections		Project collaboration		Job portal
	upskilling Courses		Mentorship		Discussion forum		Internship portal
	Skill Assessment		Discussion/QA forum		Tech updates		Freelancing projects
	Profile building						

2.3 The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programsin 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]   Web-based quiz-game-like formative assessment: Development and evaluation,Elsevier,
       https://doi.org/10.1016/j.compedu.2007.11.011

[2]   A Personalized Brain-Based Quiz Game for Improving Students' Cognitive Functions,springer,
       https://link.springer.com/chapter/10.1007/978-3-030-60735-7_11

[3]   QuizFun: Mobile based quiz game for learning,
       https://ieeexplore.ieee.org/abstract/document/5314125,

2.6 Glossary

Terms	Acronym
Variable	In Python, a variable is a named storage location used to store data that can be referenced and manipulated in a program. Variables can hold different types of data such as numbers, strings, lists, or other objects. They are essential for storing and manipulating data during the execution of a program.
Function	A function in Python is a block of reusable code that performs a specific task. Functions allow you to break down a program into smaller, modular pieces, making the code more organized, readable, and easier to maintain. They can take inputs (arguments) and return outputs, or they can perform actions without returning a value.
Conditional Statement	Conditional statements in Python allow you to make decisions in your code based on certain conditions. The most common conditional statements are if, elif, and else. These statements allow you to execute different blocks of code depending on whether certain conditions are true or false. Conditional statements are fundamental for controlling the flow of execution in a program..

3   Problem Statement:

Design and implement a text-based quiz game application in Python. The application should present a series of multiple-choice questions or fill-in-the-blank questions to the user. The questions should cover various topics, such as general knowledge, science, history, or any other subject of interest. Users should be able to select their answers or input their responses. The application should provide immediate feedback on the correctness of the user's answers and keep track of the user's score throughout the quiz. Finally, the application should display the user's final score at the end of the quiz. The program should be modular, well-structured, and include error handling to ensure smooth execution.

4   Existing and Proposed solution

1. **Quiz Game Application**: A standalone Python application that presents users with a series of multiple-choice questions or fill-in-the-blank questions on various topics.

2. **User Interaction**: Users interact with the application through the command line or a graphical user interface (GUI), selecting answers or inputting responses to questions.

3. **Feedback and Scoring**: The application provides immediate feedback on the correctness of the user's answers and updates the user's score accordingly.

4. **Question Database**: The questions and answers are stored in a database or hardcoded into the application. Questions can be randomized to enhance user engagement.

5. **Modular Design**: The application is designed with modular components for easy maintenance and scalability. It may include features such as user authentication, leaderboards, or the ability to create custom quizzes.

Limitations:

1. Limited Question Types: The existing quiz game may only support a specific type of question format, such as multiple-choice questions. This limits the variety and complexity of quizzes that can be created.

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2. Lack of Interactivity: The game might lack interactive features beyond basic question- answer functionality, such as timers, hints, or difficulty levels, which can enhance user engagement.

3. Limited Question Bank: The quiz may have a fixed set of questions, leading to repetitive gameplay and reduced user interest over time.

4. Minimal Customization: The existing project may offer limited options for customization, such as modifying quiz topics, adding new questions, or adjusting scoring mechanisms.

Proposed Solutions:

1. **Diversify Question Types**: Introduce support for various question formats like multiple- choice, true/false, fill-in-the-blank, or matching questions to offer a more diverse quiz experience.

2. **Enhance Interactivity**: Implement interactive features such as timers for each question, lifelines for hints, or difficulty levels to make the game more engaging and challenging for users.

3. **Dynamic Question Bank**: Create a mechanism to fetch questions from an external database or API, allowing for a dynamic and constantly updated question bank, which prevents repetition and keeps the game fresh.

4. **Customization Options**: Provide users with options to customize their quizzes, such as selecting specific topics, adjusting the number of questions, setting difficulty levels, or creating custom quizzes with user-generated content.

By addressing these limitations and implementing the proposed solutions, the quiz game project can offer a more engaging, diverse, and customizable experience for users, enhancing its overall appeal and usability

4.1 Code submission (Github link)

https://github.com/Kavyadivi/upskillCampus

4.2 Report submission (Github link) : first make placeholder, copy the link.

https://github.com/Kavyadivi/upskillCampus

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5 Proposed Design/ Model

Given more details about design flow of your solution. This is applicable for all domains. DS/ML Students can cover it after they have their algorithm implementation. There is always a start, intermediate stages and then final outcome.
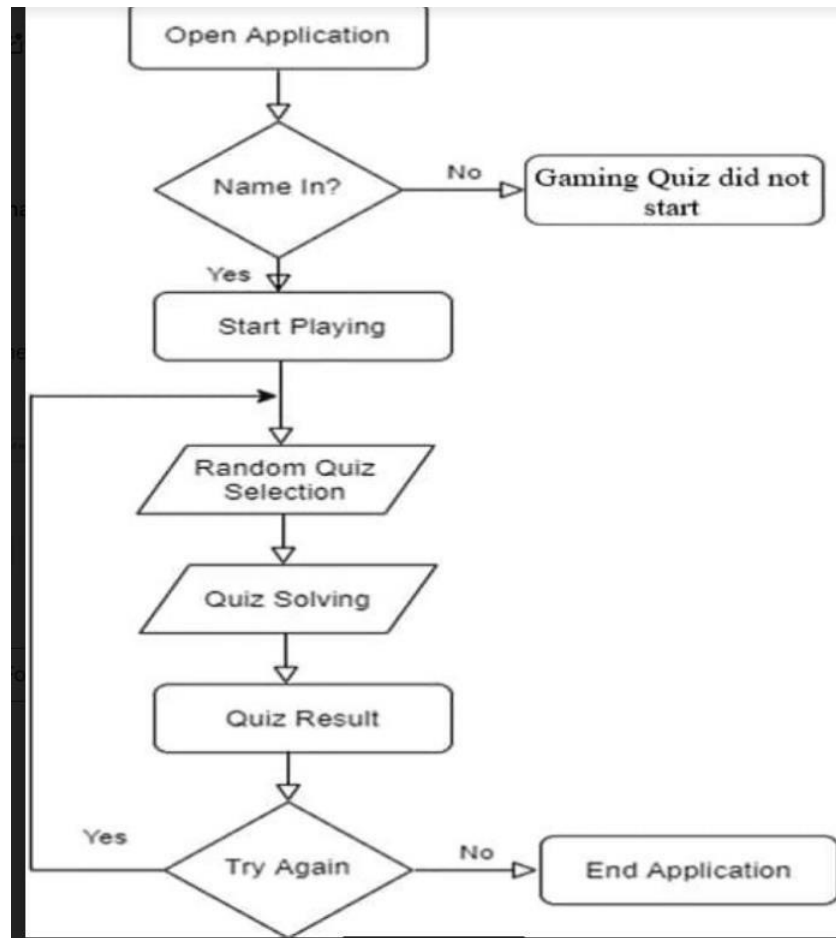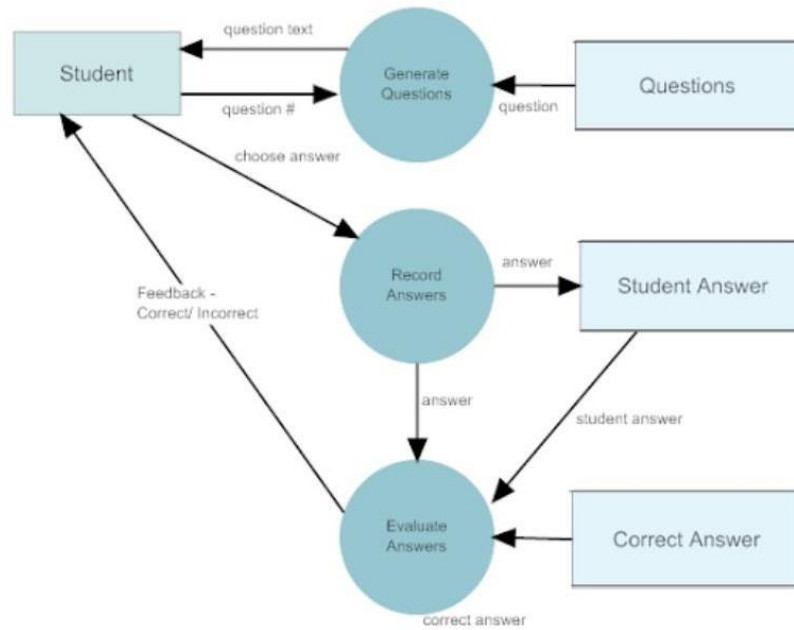
5.1 High Level Diagram (if applicable)

Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

6 Performance Test

Performance testing for a quiz game using Python typically focuses on evaluating the responsiveness and scalability of the application. Here are some key aspects to consider when conducting performance testing:

1. **Responsiveness**:

   - **Response Time**: Measure the time taken by the application to respond to user interactions, such as selecting an answer or navigating between questions. Ensure that the response time remains within acceptable limits to provide a smooth user experience.

   - **User Interface Rendering**: Evaluate the time taken to render the user interface elements, including questions, options, and feedback. Optimize UI rendering to minimize delays and ensure a responsive interface.

2. **Scalability**:

   - **Concurrent Users**: Simulate multiple concurrent users accessing the quiz game simultaneously. Measure how the application performance scales with increasing user load. Identify bottlenecks and optimize the application to handle concurrent requests efficiently.

   - **Question Load**: Test the application's ability to handle a large number of questions in the quiz database. Evaluate the impact on performance as the size of the question bank grows. Optimize database queries and caching mechanisms to improve performance with a large dataset.

3. **Resource Utilization**:

   - **Memory Usage**: Monitor the memory consumption of the Python application during quiz gameplay. Identify any memory leaks or inefficient memory usage patterns that may impact performance.

   - **CPU Usage**: Measure the CPU utilization of the application under different usage scenarios. Ensure that the application efficiently utilizes CPU resources and does not cause excessive CPU load.

4. **Network Performance**:

   - **Latency**: Assess the network latency between the client and server components of the quiz game. Minimize network latency to reduce the time taken for data exchange and improve overall responsiveness.

   - **Bandwidth Usage**: Measure the amount of data transferred between the client and server during quiz gameplay. Optimize data transmission protocols and minimize unnecessary network traffic to conserve bandwidth.

5. **Error Handling**:

   - **Stress Testing**: Subject the application to stress tests by introducing abnormal conditions, such as invalid user inputs or unexpected server errors. Evaluate how the application handles such scenarios and ensure robust error handling mechanisms are in place to prevent crashes or data corruption.

6. **Database Performance**:

   - **Query Performance**: Evaluate the performance of database queries used to retrieve quiz questions, user responses, and score data. Optimize database indexes, query execution plans, and database schema design to improve query performance.

   - **Connection Pooling**: Implement connection pooling mechanisms to efficiently manage database connections and minimize overhead associated with establishing database connections.

By conducting performance testing for a quiz game using Python, developers can identify and address performance bottlenecks, optimize resource utilization, and ensure that the application delivers a fast, responsive, and scalable user experience.

Test Plan/ Test Cases

Testing a quiz game involves verifying various aspects of its functionality to ensure that it behaves as expected. Here are some test cases you might consider:

Test case - Question Presentation: Verify that questions are displayed correctly.Check that options (if multiple-choice) are presented accurately.Ensure that the user can see the question and options clearly without any formatting issues.

Test case- Answer Submission: Test that the user can select an answer or input their response. Verify that the submitted answer is recorded correctly.

Test case- Scoring: Ensure that the score increments when the user answers a question correctly.Check that the score remains unchanged when the user answers incorrectly.

Test case- Feedback: Verify that appropriate feedback is provided after each question, indicating whether the answer was correct or incorrect.Test that the correct answer is displayed when the user answers incorrectly.

Test case- End of Game: Check that the quiz ends after all questions have been answered.Verify that the user's final score is displayed at the end of the quiz.

Test case-User Input Validation: Test the quiz's response to invalid user input, such as entering a non-numeric value for a multiple-choice question or leaving a fill-in-the-blank question blank.Ensure that the quiz provides appropriate error messages and handles invalid input gracefully.

Test case- Quiz Customization: If the quiz supports customization options (e.g., selecting a specific topic or difficulty level), verify that these options work as expected.Test that the quiz generates questions based on the selected customization options.

Handling Edge Cases: Test the quiz's behavior in edge cases, such as when there are no questions available or when the quiz contains only one question.Verify that the quiz handles these edge cases gracefully without crashing or displaying unexpected behavior.

Performance Testing: Evaluate the quiz's performance by simulating various usage scenarios, such as playing the quiz with a large number of questions or with multiple concurrent users.Measure the quiz's response time and resource utilization to ensure that it performs well under different conditions.

Compatibility Testing:

Test the quiz game on different platforms and devices to ensure compatibility with various operating systems, web browsers, or Python versions.

These test cases cover a range of scenarios to ensure thorough testing of the quiz game's functionality, usability, and performance. It's essential to conduct both manual and automated testing to validate the game's behavior effectively.

Test Procedure

1. Prepare the test environment
2. Set up the test environment
3. Execute the test cases
4. Validate test results
5. Report and track issues
6. Restest and verify
7. Repeat steps 3-6.
8. Complete the testing process

Performance Outcome

```
=========WELCOME TO QUIZ MASTER==========
-----------------------------------------
1. PLAY QUIZ
2. ADD QUIZ QUESTIONS
3. CREATE AN ACCOUNT
4. LOGIN PANEL
5. LOGOUT PANEL
6. SEE INSTRUCTIONS ON HOW TO PLAY THE GAME
7. EXIT
8. ABOUT US
ENTER YOUR CHOICE: 1


==========QUIZ START==========

Q1  Country that has the highest in Barley Production ?

A. China
B. India
C. Russia
D. France


Enter your answer: a

You are incorrect

Q2 'The Coalition Years' is the autobiography of?

A. L.K Advani
B. Pranab Mukherjee
C. Atal Behari Vajpayee
D. Sonia Gandhi

Enter your answer: B
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Q9 Who built this project ?

Aman
Nutan
Shyam
Ram

Enter your answer: B

You are incorrect

Q10 The language spoken by the people by Pakistan is ?

A. Hindi
B. Nepali
C. English
D. Sindhi

Enter your answer: B

You are incorrect

FINAL SCORE: 3
```

7 My learnings

Continuous learning plays a crucial role in career growth and professional development. It enhances knowledge, skills, and expertise, making individuals more versatile and competitive in the job market. Learning fosters adaptability and innovation, enabling individuals to navigate dynamic work environments and embrace change. It also provides opportunities for networking and collaboration, allowing individuals to build valuable connections and access mentorship. By investing in learning and staying up-to-date with the latest advancements in their field, individuals can pave the way for career advancement and seize new opportunities. Whether through Upskill Campus (USC) or The IoT Academy in collaboration with UniConverge Technologies Pvt Ltd (UCT), participating in an internship opportunity can provide practical experience and further enhance career prospects.

8 Future work scope

For future work on a quiz game using Python, several enhancements and features can be considered to improve the game's functionality, user experience, and overall appeal. Here are some potential areas for future development:

1. **User Authentication and Profiles**:

   - Implement user authentication to allow users to create accounts and log in.

   - Enable users to track their quiz performance, view past scores, and monitor progress over time.

2. **Multiplayer Support**:

   - Introduce multiplayer functionality to allow users to compete against each other in real- time quizzes.

   - Implement leaderboards to display top scorers and encourage healthy competition among users.

3. **Dynamic Question Generation**:

   - Develop a mechanism to generate questions dynamically from external sources, such as APIs or databases, to ensure a constantly updated question bank.

   - Allow users to contribute their own questions and share them with the community.