Industrial Internship Report on

”Quiz Application using Python”

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 to develop a quiz application in Python using its various libraries. The application contains basic two files one main file and json file where the questions are stored. It calls the data.json file and the quiz begins. The user can change the questions and the options by making respective changes in the data.json file. The timer functionality is also made so when the user exceeds the timer, the score is shown up till which he/she has attempted.

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

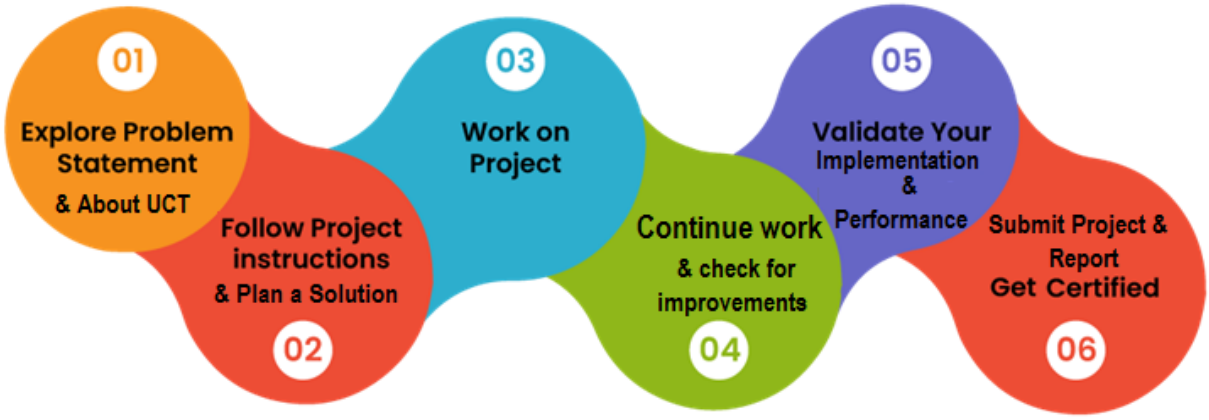
In the past 6 weeks, every week I learned something new from this internship. In the first week, I studied about UniConverge Technologies, on what domains they work and they address which challenges using which technologies. In the second week, I prepared a basic design using some online tools available in the website. In the third week, I mainly studied about python libraries and how we can create a proper graphical interface using python. The fourth, fifth and sixth weeks I devoted to trying out the code from different python libraries, testing their output and which of them best gives the output meeting the criteria of my project.

An industry relevant internship is very important in my career development as it would give me an exposure to the industry standards which I must meet in the coming future. It would require me to upskill myself in relevant technology domains, thus sharpening my skills in fields like writing good and clean code of industry accepted programming language, which in this case is python.

My project statement is to build a quiz application in python. The user must be able to import local music questions file which is named as data.json using the import function in python. The application has the feature of timer where if the user runs out of time then the score is shown as per the number of correct questions he/she has attempted. The additional images are being downloaded from the internet and has been implemented in the project itself.

UCT has provided me the opportunity to build the above mentioned project, thus exposing me to an industry relevant internship. I am grateful for this internship opportunity to UCT.

How Program was planned – this is depicted in the diagram below.



I learned a lot from this internship. I learned about the level of an industry relevant project. I learned about various python concepts and about various python libraries which exist in the market to make quiz app functional in a python powered GUI application.

I learned about the various types of outputs from different python library codes and how to integrate library code into my project using json files. Overall it was a great and enriching learning experience.

I am thankful to my friends and family who supported me all along while building this project.
My message to my juniors and peers would be to keep up skilling yourself and keep learning and taking part in internship programs.

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.

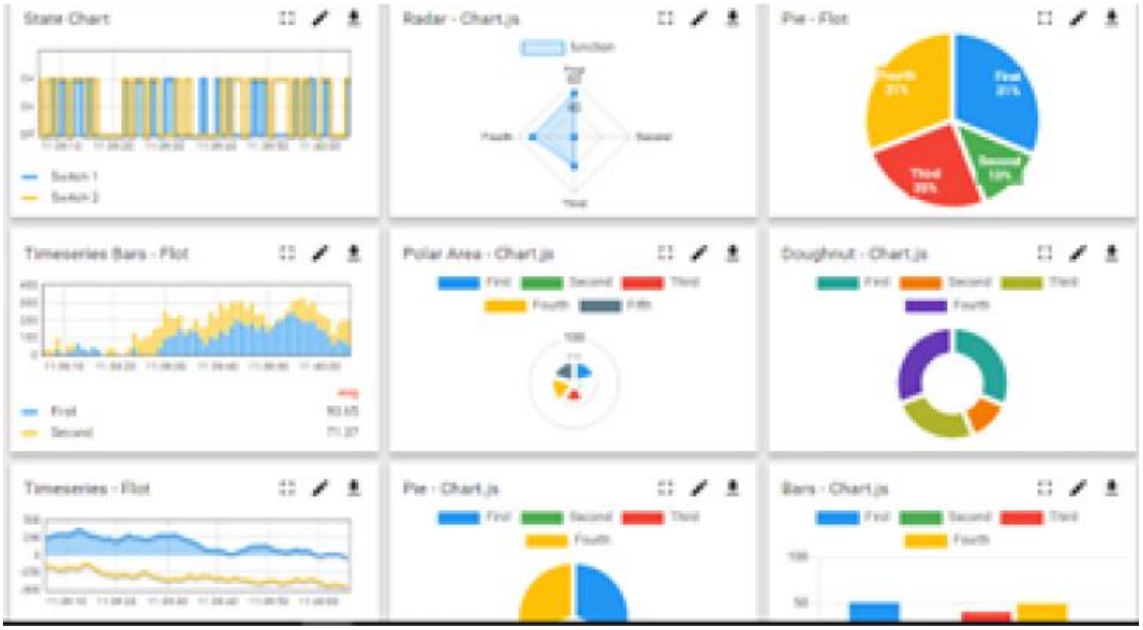
i. UCT IoT Platform (UCT Insight)

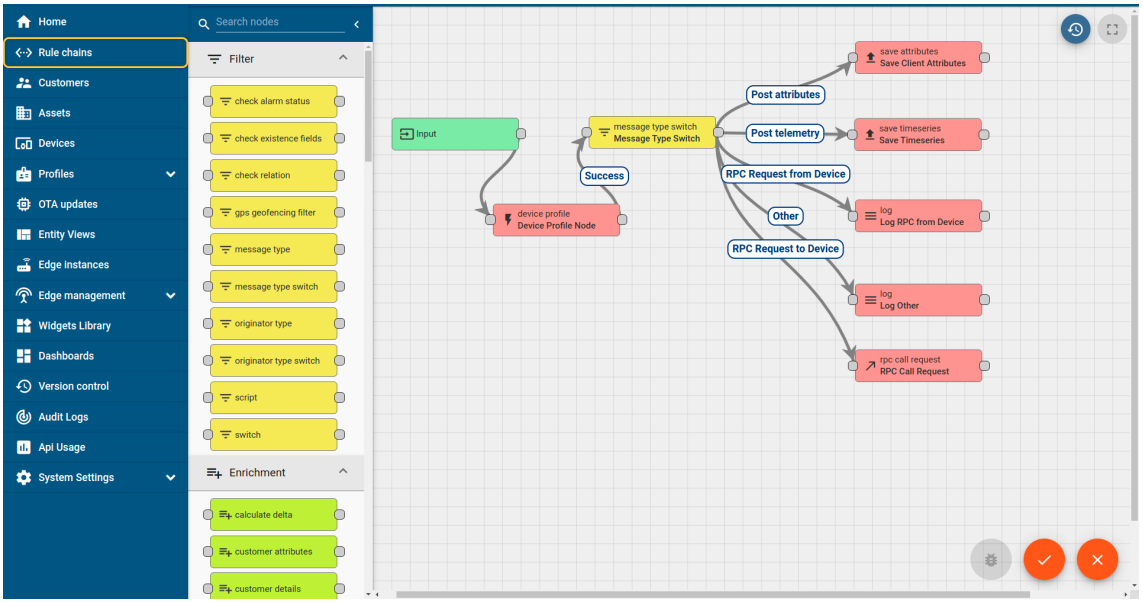
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- 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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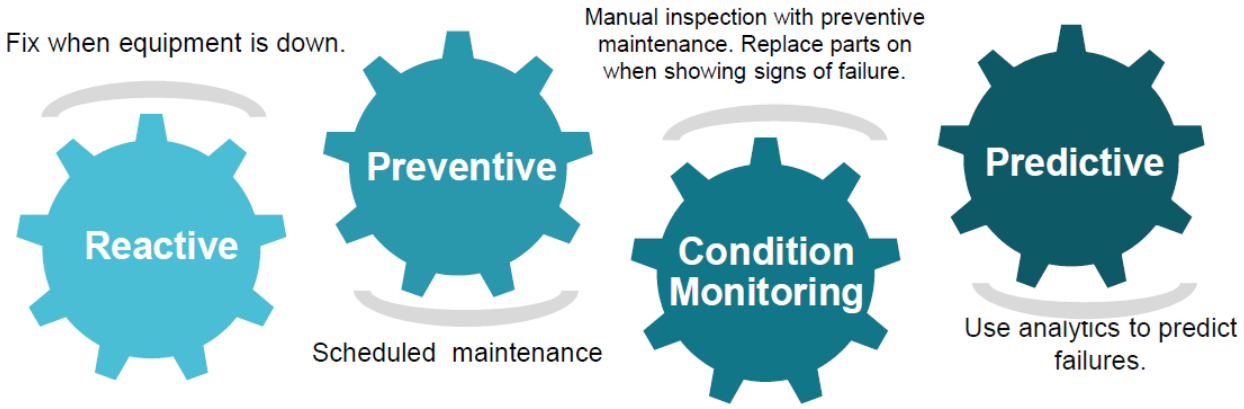
iii. LoRaWAN based Solution

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

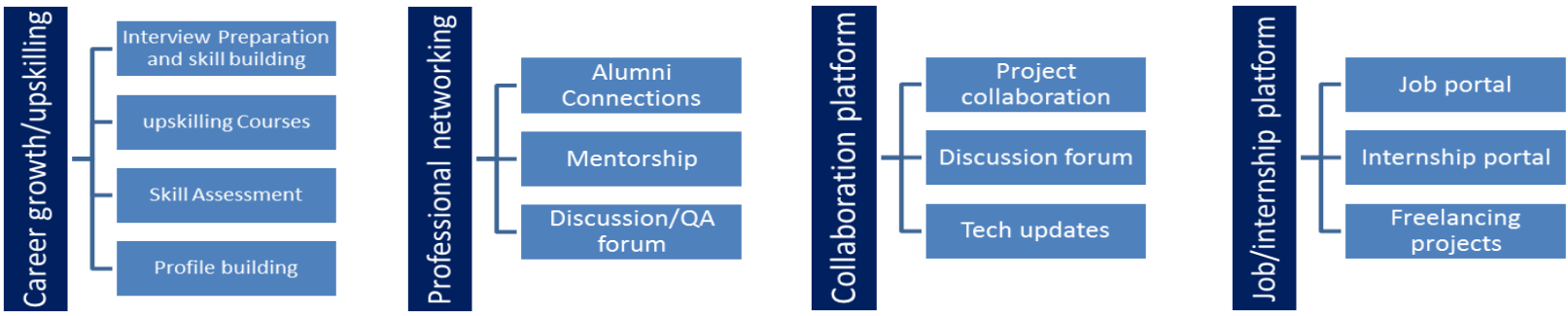
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



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.



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 learning tutorials from websites like w3schools and geekforgeeks

[2] Youtube channels on various python app development

2.6 Glossary

Terms	Acronym
UCT	Uniconverge Technologies
GUI	Graphical User Interface

3 Problem Statement

Quiz Game:

Description: The quiz game is a Python project that quizzes users on various topics. It reads questions and answers from a file or database, presents them to the user, and keeps track of their score.

I had to design a python code that will have the following features:

- A graphical user interface for the users where they will play the quiz and answer the questions
- A database or a separate file where the questions and the name of the user will be saved.
- Developing an algorithm that will calculate the final score of the user and show it to the user at the end of the quiz.
- A proper emoji type picture which will provide a proper feedback to the user.
- The user will have the power to modify the questions and add any number of questions by making the respective changes in the data.json file that will be given.

4 Existing and Proposed solution

There do exist a few solutions over the web. Different solutions use different python libraries. Some have used the concepts of data science and machine learning libraries like keras, tensorflow while making the application. Similar to random library in python, some have used the OS library as well to deal with some extra functionalities which I feel is not required and will only increase the complexity of the application. Some solutions have not included the functionality of timer so a user can go on endlessly with the quiz and can also use it for fun without getting a proper feel of a real quiz application.

My proposed solution is quite simple and easy to understand for any intermediate level python developer. I have imported the basic python libraries such as JSON, random and tkinter for the graphical user interface. I have already kept some questions in the quiz application and used the functionality of random so that each time the user attempts the quiz the questions are shuffled. The user will have to download the code so that he can view the final score in the terminal itself.

4.1 Code submission (Github link)

https://github.com/Roudranilk/QuizStar

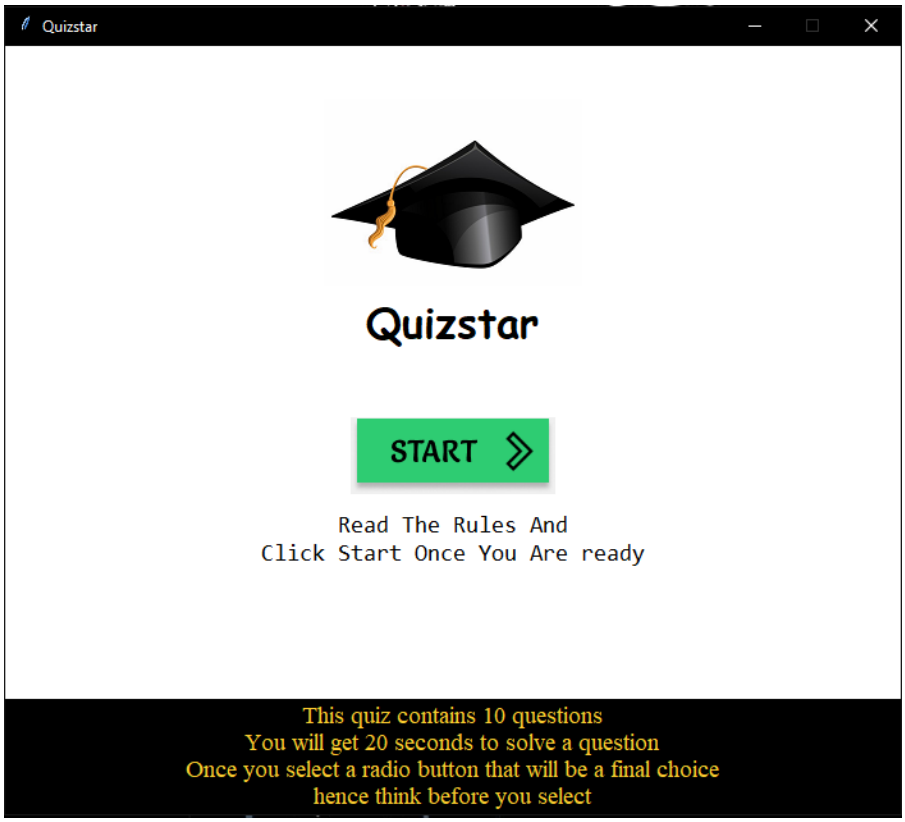
4.2 Report submission (Github link):

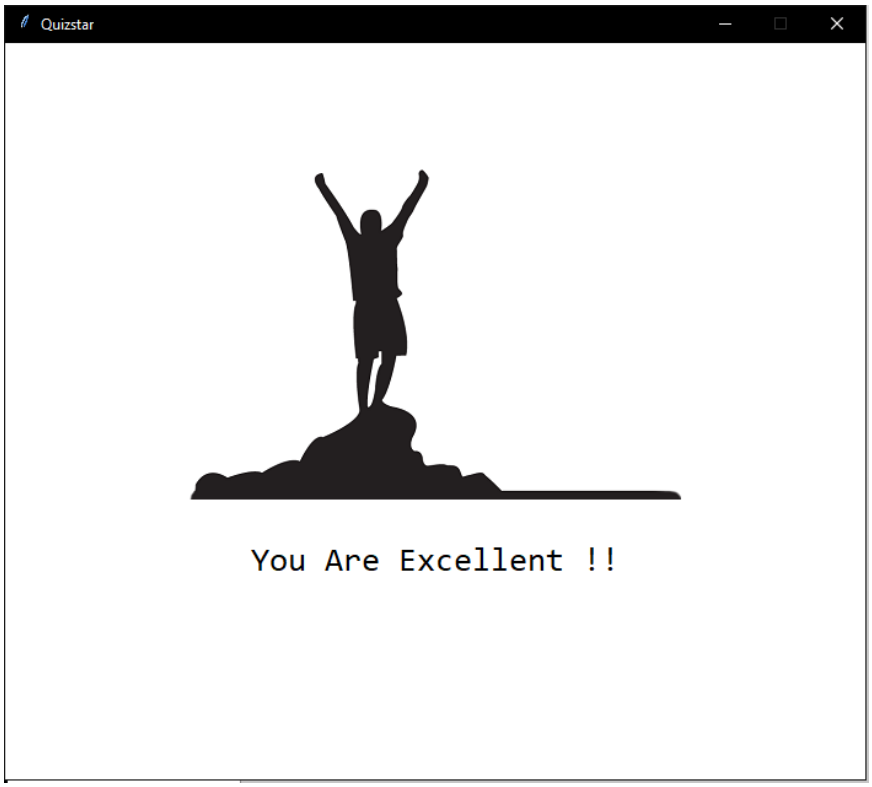
https://github.com/Roudranilk/QuizStar/blob/main/Quiz%20Application_Roudranil_USC_UCT.pdf

5 Proposed Design/ Model

Below I am providing diagrams of my proposed design, which would include the details of my design, inherent from the diagrams.

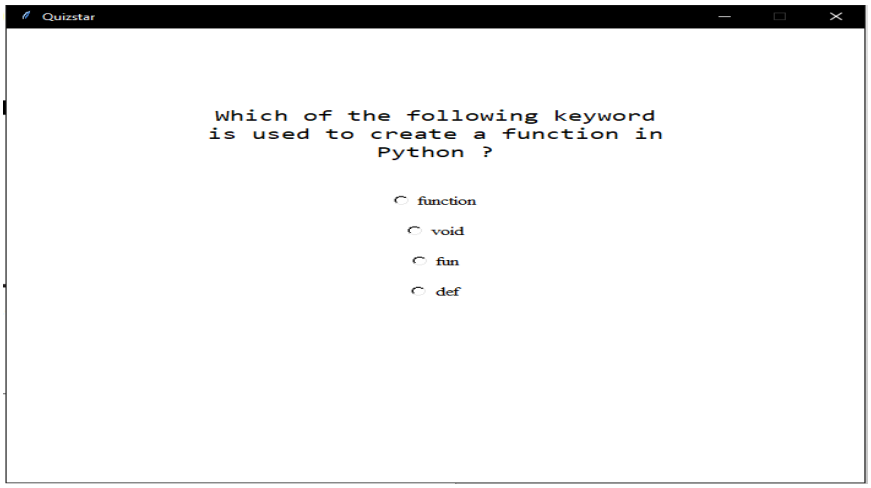
5.1 High Level Diagram (if applicable)





5.2 Interfaces (if applicable)

Interfaces are already evident from the high level diagrams of the system I provided. I am also providing the image of the functional UI of the question and answer format from my source code below.



6 Performance Test

This is very important part and defines why this work is meant of Real industries, instead of being just academic project.

Here we need to first find the constraints.
Constraints include device memory taken by the application, the speed at which the application responds, accuracy and durability of the application and power consumption of the application.

Test results:-

Standard device storage (like 512GB) or more is more than sufficient. The application itself shall not require more space than 100 MB space (space for source code files), along with that it will take the memory space if the user wishes to keep some more questions. The image files can be accommodated in the standard storage spaces available in the machine. RAM of 8GB should be sufficient for proper running of the quiz application, though 4GB RAM will also do.

The application shall respond as soon as we click on any feature, making it speed efficient. The application shall not buffer with 8GB RAM or more.

Proper working features do ensure the accuracy of the application and since it runs on python source code files, no change in the python source code files ensures the durability of the application over time. It is not a high power consumption application as it is a simple quiz application and the same can be ensured through operating system checking credentials present in the computer on which the application runs.

6.1 Test Plan/ Test Cases

Test plan/test cases would be to check the functionalities of the quiz application while keeping the above mentioned constraints in mind. The requirements to be tested are the ability to import local json file into the application, whether the import feature is causing any bugs while file searching or not. The tkinter and other libraries must be properly installed to ensure the proper running of the application. Operating system resources usage tracing can be done in the computer system in which the application runs to test the remaining constraints which are as mentioned above.

6.2 Test Procedure

Functionalities of the application can be tested by clicking on the buttons which enable the features in the application and then tracing the working of the functionalities, as to whether they work with any bugs, delays or runtime difficulties. Application storage can be checked in the file manager of the host system to see the memory benchmarks of the application, as to what is the total space occupied by the

python file along with cache storage for imported files and images. Features like speed can be tested by tracking time taken for the application to open and tracking time for each feature to work. Features like RAM usage can be traced with the host system checking features available to test the RAM usage for any application. Host OS system checking functions can also be used to check the power consumption. Consistent source file storage should ensure accuracy and durability of the application.

6.3 Performance Outcome

Test performance outcome is that all features do work properly for the application. Sometimes there could be a few execution time errors while running the python files which need to be removed. Possible errors could pop up during the run time of the python source files using different IDEs and operating systems (like execution command errors) which have to be resolved. As of memory, standard local device storage which comes integrated with host computer will do the work. RAM of 8GB or more is sufficient for the application and power consumption is not very high. Speed of the application is standard depending on RAM usage availability and no changes in source code files ensure the accuracy and durability of the application.

7 My learnings

My learnings include:-

1. Understanding the standards and the criteria of an industry level project, including constraint complexity, how to research to complete a project and checking its performance.

2. Learning OOPs concepts and python concepts in depth which are essentially asked in job interviews and are required to build applications.

3. Learning about various java GUI tools like tkinter in comparison of the GUIs created through them and their implementation and advantages. My learnings how the libraries can be used to make an overall proper GUI for the user.

4. Learning to add external files into python and json extension of python that helps in importing and using the files from external source.

8 Future work scope

Future work scope in this project can include enhancing the features of my quiz application, making it like the quiz application of large companies conducting online quiz or hiring contests. I would like to implement the frontend technologies like ReactJS, and tailwind CSS to make it look good. I would also like to use question APIs available over the web instead of cumbersomely asking the user adding questions previously to separate files and import them locally. APIs would make user experience much smoother. I would also like to enhance the functioning of my features which are available in my quiz app, making the features work with smoother transitions providing better user experience.