A Project Report

on

A SMART QUIZ APPLICATION IN CLOUD ENVIRONMENT USING AWS

Submitted in partial fulfillment of the
requirement for the award of the degree of

Bachelor of Technology in Computer Science and Engineering

GALGOTIAS UNIVERSITY

(Established under Galgotias University Uttar Pradesh Act No. 14 of 2011)

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SCHOOL OF COMPUTING SCIENCE AND ENGINEERING
GALGOTIAS UNIVERSITY, GREATER NOIDA

CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the project, entitled **A SMART QUIZ APPLICATION IN CLOUD ENVIRONMENT USING AWS** in partial fulfilment of the requirements for the award of the Bachelor of Technology submitted in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of September,2022 to October, 2022, under the supervision of Mr. Rajakumar P. ,Department of Computer Science and Engineering, School of Computing Science and Engineering , Galgotias University, Greater Noida

The matter presented in the thesis/project/dissertation has not been submitted by me for the award of any other degree of this or any other places.

Krishna19SCSE1260012
Shashank Singh 19SCSE1010536

This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Mr. Rajakumar P.

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ABSTRACT

The concept of questions is now very popular among educated circles and in entertainment shows. Although questions can be done in person and require detailed preparation, the questions contribute to the growth of individual knowledge and are a popular source of entertainment. This program in Java focuses on creating interactive queries with a very large quiz site. The program uses a lot of important concepts in the design of Java and the applet to get the final result is a view from the knowledge and get entertainment that includes value. The system reduces paperwork and all information will be stored securely on the Application. This app stores questions in a database where a set of six questions will appear. Designed to replace existing paper and manual adjustments. This program uses java as the front end and MySQL as the back end of the Application. The implementation of the program in the organization will significantly reduce time and provide easily calculated marks.

Project: "Question System" is a collection of a number of different types of questions such as technology, games, sports, etc. User can access / play all queries and try any of them. There will be a limited number of questions and each user of the correct answer will receive credit points. The user can see the answers and can ask a related question. There are many queries available right now online. But there are a few Providers of better understanding between users and the app such as providing appropriate answers, solving user queries, uploading user queries and answers to it, etc. Developing a friendly quiz app that will contain: Answers to all questions, resolving queries about any question, User query uploads and feedback, and improving the level of user knowledge. Creating an application that will contain a solution to the above problems. With this app the user will know about his level and can learn more information. And with this app the user can increase his knowledge in the middle of the world.

LIST OF TABLES

1. INTRODUCTION

1.1.   Purpose

This application provides a place to show puzzle, exercise Grammar, Skill, etc. It provides a good platform, where the student not only judges knowledge / skills but also is able to develop knowledge / skills at the same time.

1.2   Scope

The Scope of this project is very broad in terms of gaining knowledge and sharing knowledge among world.

Few points are:-

Can be used anywhere any time as it is a web based application.

This application will be used in educational institutions as well as in corporate world.

1.3   Problem Definition

"Our goal is to develop an app for users where the user can try any number of queries related to his or her preferences."

First, we need to create links to the Home page, Registration, Login Page, Quiz Forum, Result Page, and User Profile. These are all pages that link to the server and the site. So, that can work well. Currently, there are Applications that only offer a limited number of queries related to a different domain. Many Applications do not have a single forum for technology-related questions, G.K, Fitness, Games, etc. And there is no Application where users can upload their questions and answers to others. We need to build an app that can solve all of the above problems. With this user he can get information, can solve his question, and spread his knowledge in the world.

1.4   Proposed Solution

The main requirement of the application is to find questions and answers. In this application for the first time the user needs to register or login using the user id and password. The user can then select any questions of their choice. Before starting the quiz there is a guide window where there are instructions related to quiz quiz. After that the user can start getting questions. Here the user can see if their answers are right or wrong and they can also see their individual answers. If there is any related question the user can ask it. Upon completion of the question the user will receive credit points for each of their correct answers. Initially the questions are given to the administrator but after some time the user himself can post the questions and their answers. After confirmation by the administrator the questions are displayed in the window. Question-related query that we can resolve by the administrator and users of this application. This app contains preliminary acknowledgment and a specific user who can post questions and answers. User profile will contain its name, age, qualifications, gender, mobile number, credit score, etc. This application will provide a link to an additional useful Application for the purpose of learning.

2. SYSTEM REQUIREMENT ANALYSIS

2.1 Overall Description-

2.1.2 Product Perspective

Quiz app based on web application. It usually communicates with the user and readers. Especially a quiz application where there are 4 categories. Each section will hold 10 questions, and each question has 1 mark. No negative tagging. If we do not try any questions it will show a "not tried" mark.

On the result screen, we will display the full marks found in the question, the wrong answer will also be displayed with the correct answer.

The main purpose of this app is to develop knowledge and skills for students and the user.

2.1.2 Product Function

Account login: Student/user can login using login id and password.

Account logout: Student/user can logout the account whenever required.

Result: Student/user attempted the quiz and gets a result.

Feedback: Student/user can give a feedback.

Play quiz: Student/user can play the quiz according to his/her choice.

Add Questions: Admin can add the question by selecting the topic.

2.1.4 Operating Environment

S.NO.	NAME	HARDWARE
1.	Processor	Intel dual core(32 bit)
2.	RAM	2 GB
3.	Processor Speed	2GHz

2.1.5 Design And Implementation Constraints

Programming Language used: JAVA.

Platform used: NETBEANS.

Database/Backend: MySQL.
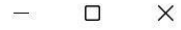
Cloud Environment: AWS(Amazon Web Services)

2.2.1 User Required

The Admin has the access to overall control the functionalities of the system. The platform users i.e., admin student/user will be protected by login and password since; the platform allows the users to make some changes that can have propagating effects in the system. They can upload their updates and details in the system.

Home Page:

Rules page:

Welcome Naman to Simple Minds

1. You are trained to be a programmer and not a story teller, answer point to point

2. Do not unnecessarily smile at the person sitting next to you, they may also not know the answer

3. You may have lot of options in life but here all the questions are compulsory

4. Crying is allowed but please do so quietly.

5. Only a fool asks and a wise answers (Be wise, not otherwise)

6. Do not get nervous if your friend is answering more questions, may be he/she is doing Jai Mata Di

7. Brace yourself, this paper is not for the faint hearted

8. May you know more than what John Snow knows, Good Luck

Back   Start

2.2.2 Hardware Required

S.NO.	NAME	HARDWARE
1.	Processor	Intel dual core(32bit)
2.	RAM	2 GB
3.	Processor Speed	2 GHz

Table 2.2.2.1 Hardware Required

2.2.3 Software Required

S. No	NAME	SOFTWARE
1	Platform	Windows 7
2	Database tool	MySql

Table 2.2.3.1 Software Required

2.3 Functional Requirement

2.3.1 System Feature

This section provides the operating requirements applicable to the online quizing system.
There are three modules in this category:

1. Student or user module.

2. Administrative module.

The functionality each module is:

Student or user module:

> The student/user have to login in application. They can choose any of the given quiz. Then the student/user will get result immediately after the completion of test.

Administrative module:

The manager can see all the tables in the Database and can add a question by selecting a specific topic.

2.4 Inaccurate Requirement

2.4.1 Operating Requirements

1. Response time-

The system will provide responses within 2 seconds after user login.

2. Capacity-

The system can support multiple computer but it need to be install on every computer separately.

3   ANALYSIS

3.1   Methodology Used

The programming language used for the development of the project is JAVA and the software model used is the classic lifecycle model.

3.2 USECASE DIAGRAM

:   USECASE DIAGRAM

A simple user interface diagram represents user interaction with a system that shows the relationship between the user and the unique user environment in which users are involved. The application case diagram can identify different types of system users and different operating conditions.

3.5 CLASS FIGURE

USER

+ First Name; String
+ DOB: date
- Password:String
+ Email:String

Play Quiz   1..*

+ Id : Interger

+ Get Score ()
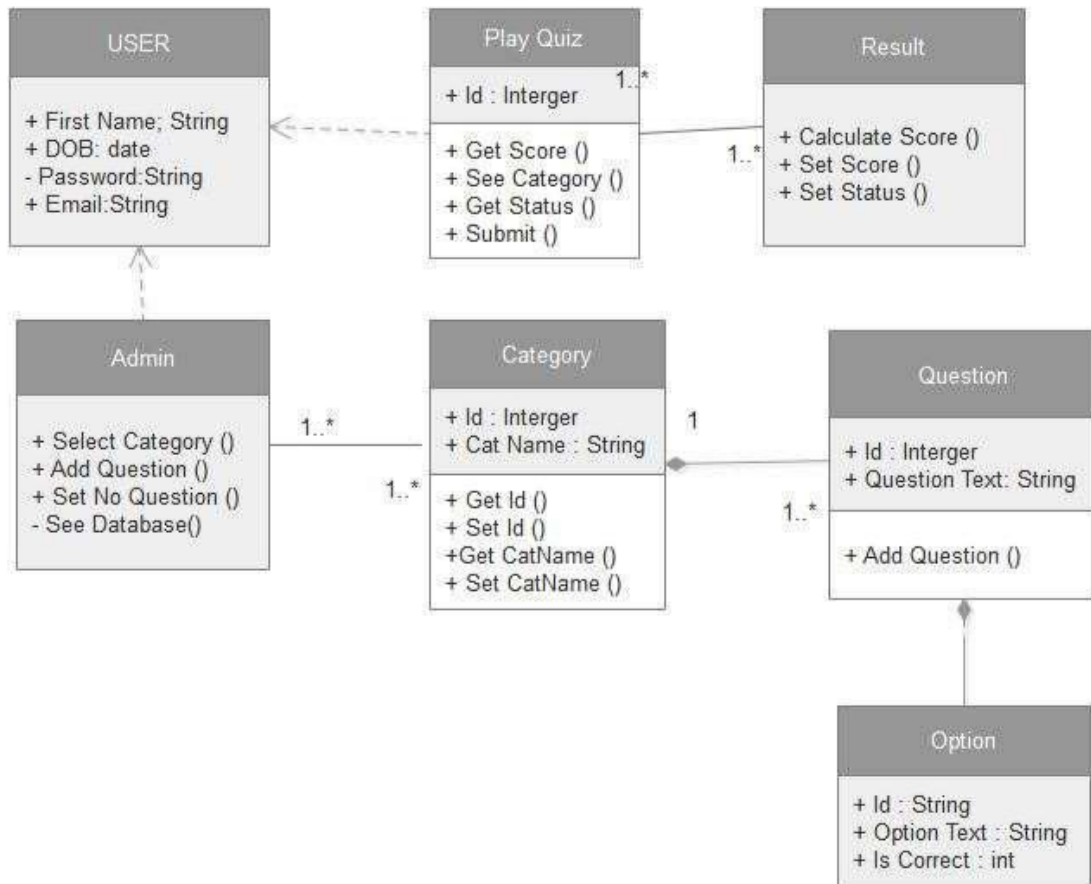+ See Category ()
+ Get Status ()
+ Submit ()

Result

+ Calculate Score ()
+ Set Score ()
+ Set Status ()

1..*

Admin

+ Select Category ()
+ Add Question ()
+ Set No Question ()
- See Database()

1..*

Category   1

+ Id : Interger
+ Cat Name : String

+ Get Id ()
+ Set Id ()
+Get CatName ()
+ Set CatName ()

1..*

Question

+ Id : Interger
+ Question Text: String

+ Add Question ()

1..*

Option

+ Id : String
+ Option Text : String
+ Is Correct : int
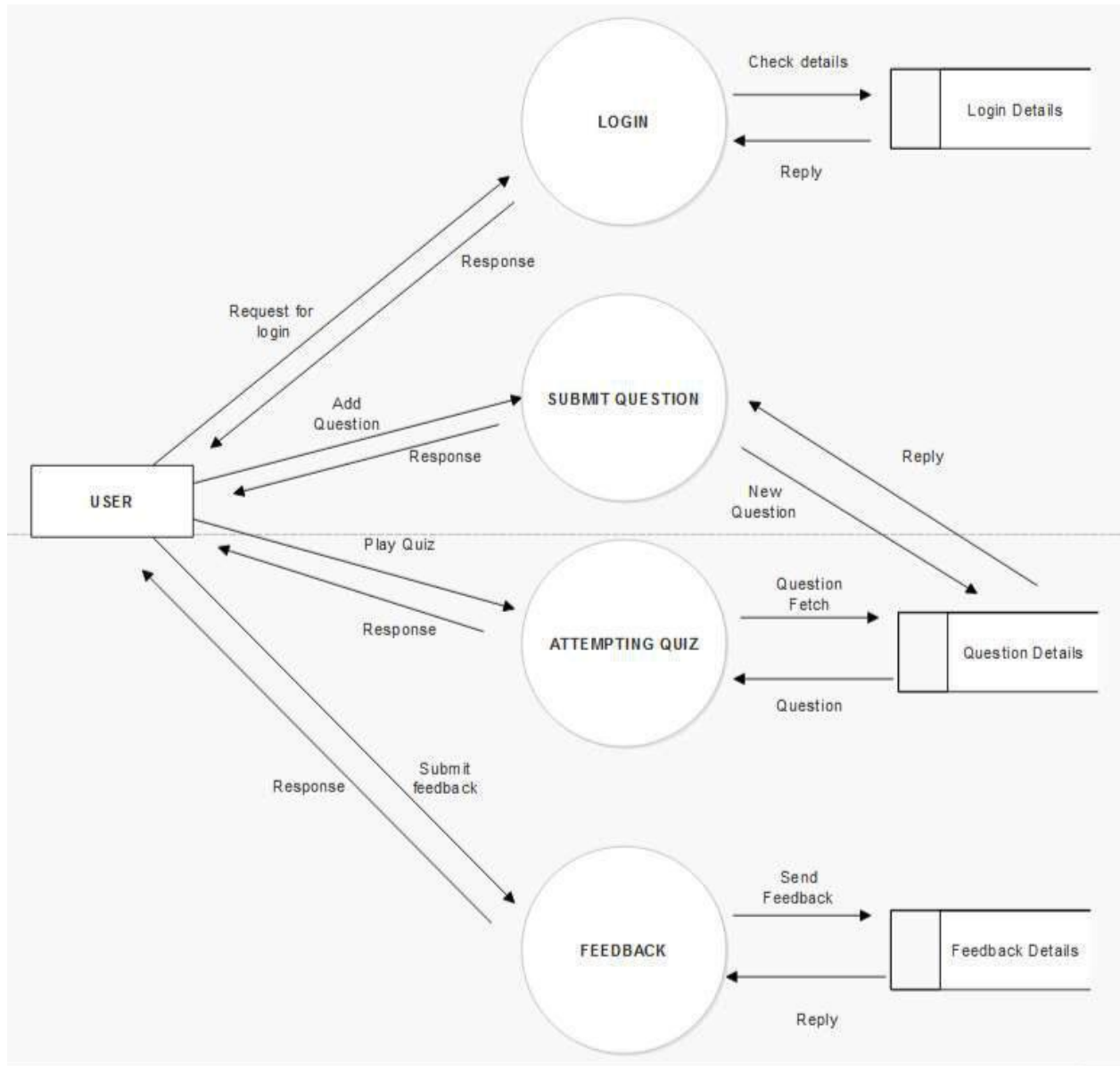
3.6   Data flow diagram

Fig: 3.6.1

4. DESIGN

4.1 Architectural Plan

4.1.1 System - Architectural Design

A three-phase architecture is a client software software architecture in which the visual interface of the application (presentation), working system intellect ("occupational rules"), data storage & access are industrialized and preserved as separate components, usually on separate stages. .

In addition to the common advantages of modular software with a well-defined interface, the three-phase Architecture is intended to allow any of these three categories to be developed or replaced independently due to required changes or technologies. For example, the change of the operating system in the launch stage will only affect the use of the line.

Typically, the visual application works on a desktop computer or workstations and uses a standard user interface operating system that may include one or more different modules running on operating system servers, as well as RDBMS on a stored server or a large frame containing a computer. data storage logic. The middle class may have many sections of its own (where the whole architecture is called "n-tier architecture").

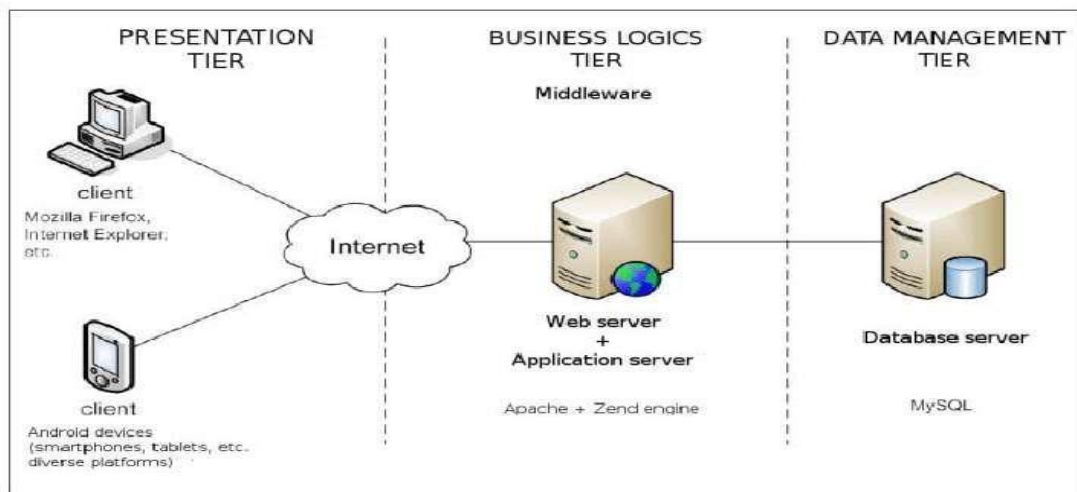#### 4.1.2 Description of Architectural Diagram

Fig: 4.1.2.1 A 3-Tier Architecture

Cloud Computing

Cloud computing is a framework by means of which virtualized infrastructure resources are delivered as a service to customers by using a public network which is the Internet.

Cloud infrastructure refers to the hardware and software components, such as servers, storage, networking, virtualization software, services and management tools, that support the computing requirements of a cloud computing model.

Cloud infrastructure underpins cloud computing by disaggregating the functions and features of those hardware and software components. Then, a cloud service provider -- or information technology (IT) department in the case of private cloud -- hosts those virtualized resources and delivers them to users over the internet or a network. These resources include virtual machines (VMs) and components, such as servers, memory, network switches, firewalls, load balancers and storage. These resources often support extensive and task-specific services, such as artificial intelligence (AI) and machine learning.

In a cloud computing architecture, cloud infrastructure refers to the back-end technology elements found within most enterprise data centers -- servers, persistent storage and networking equipment -- but on a much greater scale. Some large cloud providers, including hyperscale cloud companies, such as Facebook and LinkedIn, form partnerships with vendors to design custom infrastructure components that are optimized for specific needs, such as power efficiency or workloads that include big data and AI

Public vs. private vs. hybrid cloud architectures
Cloud infrastructure is present in each of the three main cloud computing deployment models: private cloud, public cloud and hybrid cloud.

Private cloud
In a private cloud, an organization typically builds and owns the cloud infrastructure components and houses them within its own data center. This setup is a single-tenant environment, meaning the organization is the only one using the dedicated infrastructure and services. This architecture seeks the best of both worlds: versatility and convenience of cloud-delivered services, with the tighter control, management and security that come with data center ownership.

Organizations may choose a private cloud infrastructure because their computing needs are irregular and would be too costly to run in a public cloud model. They may require greater control or security over infrastructure assets, critical applications or sensitive data or must meet specific regulatory and governance requirements.

Public cloud
In a public cloud model, the cloud infrastructure components are owned by a third-party public cloud provider, and these resources are shared among customers in multi-tenant environments. Customers pay for services and capabilities based on core infrastructure resources -- central processing unit (CPU) cycles, storage, bandwidth, etc., as well as higher-level services -- but do not own or manage those underlying resources themselves. Cloud providers sell these services on demand, typically per minute or hour, often through long-term commitments.

Hybrid cloud
A hybrid cloud consists of a mix of both models to form a single logical cloud for the user. A business can rely on a private cloud to run certain workloads or sensitive applications or host private sensitive data, while it runs other apps and data in a public cloud. Public cloud resources also can be tapped to handle bursts or spikes in demand to provide flexibility for private cloud use.

A related model is a multi-cloud model, in which an enterprise uses multiple cloud providers. This may be to run services concurrently for resiliency or migrate apps between providers.

What are the different types of cloud computing delivery models?
Cloud computing services are delivered in three models that reflect the levels of resources accessed and provided.

Infrastructure as a service
In an infrastructure as a service (IaaS) model, organizations consume cloud infrastructure components as resources and services over a dedicated internet connection. This typically carries recurring periodic costs to the user and enables providers to generate revenue through rental or other pay-as-you-go models.

On top of those basic cloud infrastructure services, providers offer an array of more granular, specialized services. Examples include container infrastructure, service fabrics, serverless functions and managed network services -- virtual private clouds, load balancers, domain name services, application delivery controllers, firewalls, etc.

Cloud providers typically price IaaS on a metered basis, with rates corresponding to usage at a given level of performance. Examples include the following:

increments of a standard virtual CPU size and corresponding memory; storage service type (object or block), performance level (SSD or HDD) and availability; and capacity measured by usage per unit time, typically per month.
IaaS vendors also provide discounts for sustained usage or the use of a consistent level of compute capacity for a specified amount of time. Customers also can achieve

savings through reserved capacity, where they prepay for a guaranteed level of capacity for a month, year or multiple years.

Platform as a service
In recent years, the lines have blurred between IaaS and platform as a service (PaaS), which builds additional capabilities on top of those infrastructure resources. These include functions such as load balancing, autoscaling, application development frameworks and automated deployment mechanisms. Customers' overall IT and business requirements should determine how far up and down the stack they rely upon a cloud provider's services.

Software as a service
A third type of cloud delivery model, software as a service (SaaS), does not directly involve customers using cloud infrastructure-based resources as they do with IaaS and PaaS models. With SaaS, a provider hosts and manages an application, typically set up as a multi-tenant architecture. Customers log in to use the service, typically through a browser. The customer's data used with the application can be stored locally, in the cloud or both.

Cloud infrastructure vs. cloud architecture
Cloud architecture refers to the blueprint for a cloud environment of components and services at massive scale, from which a provider offers a vast array of cloud services. These are delivered through isolated locations -- availability zones -- each with multiple connected physical data centers.

Cloud infrastructure is the physical representation of those plans: hardware, operating systems and virtual resources that deliver services for compute, storage, networking and middleware, all integrated together. Public clouds provide the abstracted capabilities of these physical resources to provide them as services that can easily scale to match individual customers' workloads. This includes separating control and management of those physical resources, such as using locally attached storage rather than shared disk arrays.

Public cloud services are designed to support multiple thousands of unique customers through multi-tenancy, and their architecture and infrastructure must ensure sufficient performance, reliability and security of that infrastructure.

on an hourly, weekly or monthly basis. Additionally, the large capital expenditures for on-premises infrastructure investments is converted to a smaller, recurring and predictable operational expense.

Security. Initial concerns about the security of public cloud resources have diminished. Cloud providers constantly invest in and improve their abilities to protect their infrastructure from security threats. Most cloud security issues can be traced to user misconfigurations of individual services, rather than external bad actors.

Disadvantages of cloud infrastructure
At the same time, there are several challenges to consider when using a cloud infrastructure.

Shared security. Although cloud providers are vigilant to secure their cloud infrastructure, it's exceedingly complex to oversee that scale of infrastructure and services. Moreover, the shared responsibility model means providers only secure their infrastructure -- customers are responsible for protecting their workloads and data through proper configuration, access controls and monitoring.
Visibility and management. The virtualization layer of a cloud infrastructure generally means customers do not have visibility into the actual physical hardware upon which their workloads run. Public cloud providers do offer dedicated hardware and bare-metal servers, which provide control over the entire server stack and also typically higher performance but at higher costs.
Out-of-control costs. A pay-as-you-go model works for cloud customers as long as they closely allocate and monitor the services they use. Overprovisioning, inactive resources and failure to understand service dependencies all can quickly add up to unexpected cloud costs. Customers must diligently monitor and manage cloud use as they consume increasingly granular, complex and integrated cloud services.
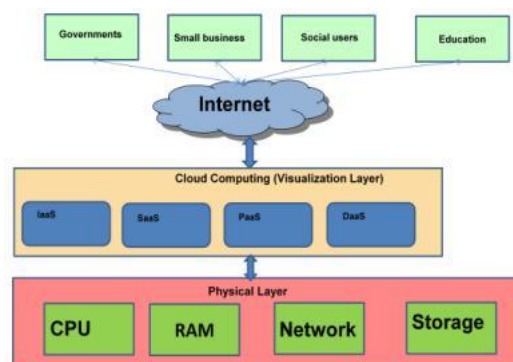

Cloud Computing Architecture

Instance Type	EC unit	Cores	Architecture	Disk (GB)	RAM (GB)
Small	1	1	32	160	1.7
Medium (H-CPU)	5	2	32	350	1.7
Large	4	2	64	850	7.5
Extra Large	8	4	64	1690	15
Extra Large (H-CPU)	20	8	64	1690	7

Features of Amazon EC2

| Small	Medium (H-CPU)	Large	Extra Large	Extra Large (H-CPU)	Local Machine
656	375	110	125	125	360
734	375	125	172	125	360
844	375	109	124	125	359
650	438	172	187	125	360
STDDEV 122.9	STDDEV 23.5	STDDEV 48.9	STDDEV 27.7	STDDEV 7.2	STDDEV 1.1
Average 769.3	Average 383.2	Average 126.9	Average 153.8	Average 129.6	Average 359.8

Response time of EC2 Instance (in milliseconds)
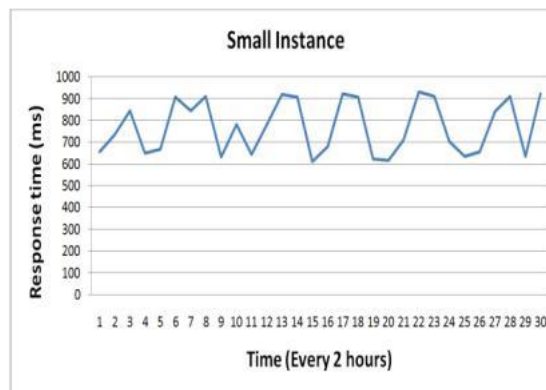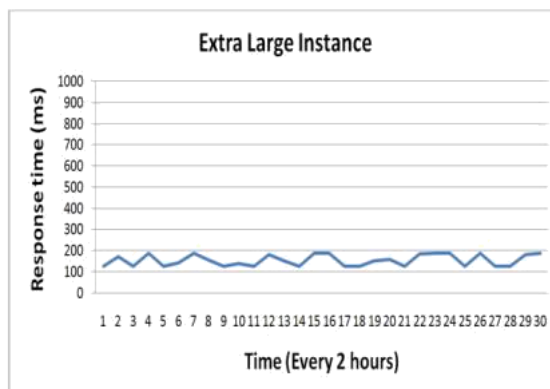

Response Time of Small instances
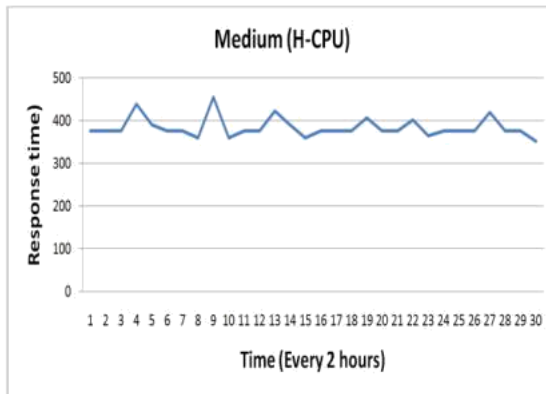
Response time of medium instances
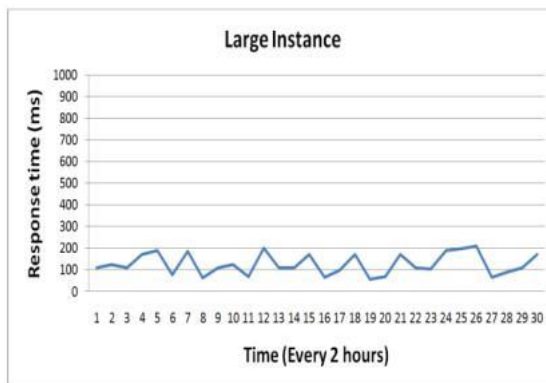
Response Time of Large instances

Response Time of Extra Large instance

4.2 Database Design

4.2.1 Normalization

It is a process of forming data on a site. Normal performance is a systematic way of decomposing a table in order to eliminate the reuse of data with undesirable features such as adding, updating and deleting Confusion. This is a multi-case process that puts data in a table form by extracting duplicate data into related tables.

Normalization is mainly used for two purposes:
Eliminate unwanted data.

Ensuring data dependence makes sense i.e. data is stored reasonably.

Our table on the Application is in 1 NF form.
It states that table attributes cannot hold multiple values. Must hold a single value attribute. 1 NF does not allow quantity attribute, composite attribute, and your combinations.

Name
Password
Email id
Mobile no.
Address
DOB

Fig:4.2.1.1 Database Table

4.3 Component Diagram

4.1 Flow diagram

It is a type of illustration which symbolizes an process, a roadmap or process, showing steps such as boxes of many types, and connecting them with arrows. This diagram shows a model of a solution to a particular problem. Flow charts are used in examining, scheming, writing or working a process in a variety of fields.
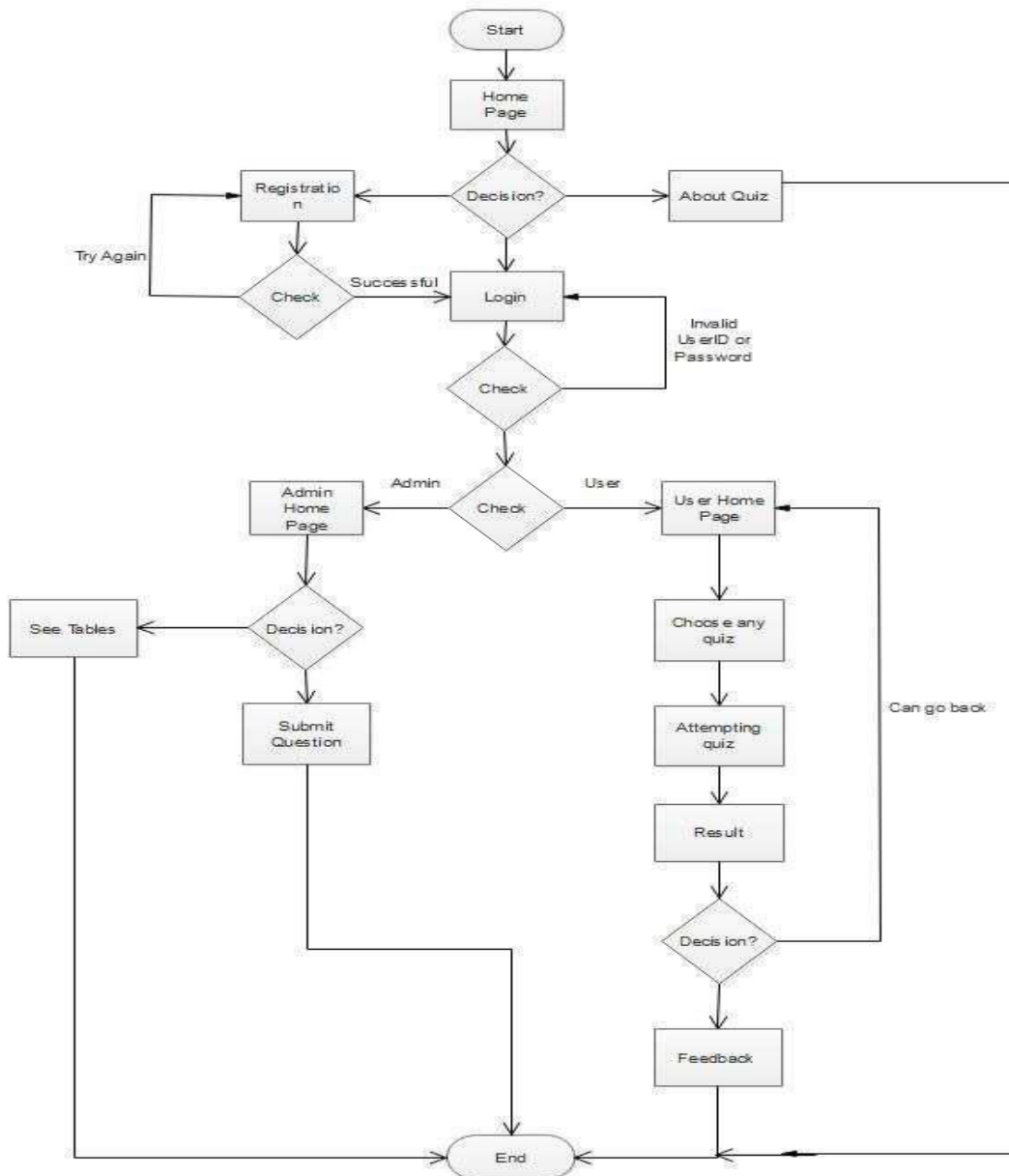
Flowchart

4.4 Interface Design

The user interface is a view of the end-to-end application where the user interacts with the software. The user can trick and control the software and hardware using the user interface.

The UI can be image-based, text-based, video-based, depending on the combination of fake computer software and software. The UI can be hardware or software or a combination of both.

4.4.1 Screen Shots
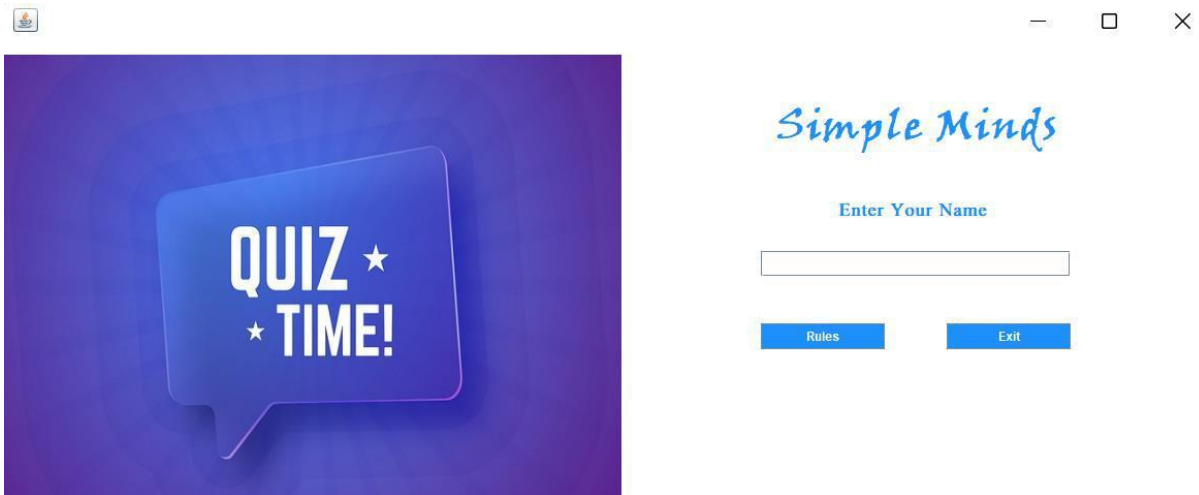
Home Page

Welcome Naman to Simple Minds

1. You are trained to be a programmer and not a story teller, answer point to point

2. Do not unnecessarily smile at the person sitting next to you, they may also not know the answer

3. You may have lot of options in life but here all the questions are compulsory

4. Crying is allowed but please do so quietly.

5. Only a fool asks and a wise answers (Be wise, not otherwise)

6. Do not get nervous if your friend is answering more questions, may be he/she is doing Jai Mata Di

7. Brace yourself, this paper is not for the faint hearted

8. May you know more than what John Snow knows, Good Luck

Back   Start

Rules Page

3. Which package contains the Random class?

○ java.util package
○ java.lang package
○ java.awt package
○ java.io package

Time Left - 7 seconds

Next

50-50 Lifeline

Submit

Quiz Page

Thankyou Naman for Playing Simple Minds

Your Score is 10

Play Again

Score Page

5. Implementation

5.1 Language And Database For Implementation

For the frontend development:

Java AWT, Swing

For the backend development:
Java Applets

For the Database Management:
MySQL

5.2 Feature Of language & database used for the project

Java Applets: Applet is a special type of program embedded in a web page to produce dynamic content. It works within the browser and works on the client side**.**

MySQL: Single & Integrated Location, Analysis Services, Reporting Services, Management Services.

5.3 Third Party tools used

IDE: Netbeans (Glass fish server).

Designing phase: UML Diagram (Draw.io).

6.CONCLUSION

This online quiz app gives you the opportunity to play queries anywhere and anytime. Save time as user needs to wait for the result. Therefore the reader / user cannot wait for the result. All students / user gain additional knowledge and skills. The administrator reserves the right to ask multiple questions at any given stage of the application. The user can register, log in, and provide testing with his or her unique id, and can see results.

REFERENCE

https://www.W3schools.com/
 https://stackoverflow.com/
https://www.quora.com/
https://www.draw.io/