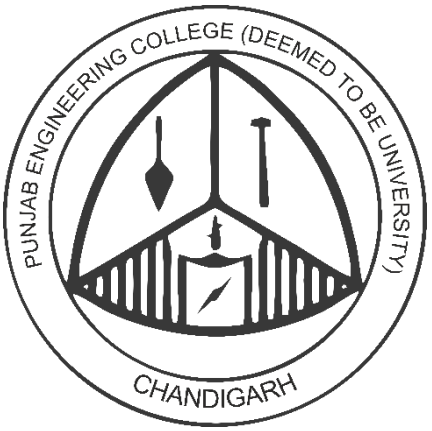

MAP-G

(Mindset Analysis using Psychometric Games)

Capstone Project Report

(CSN 451)

Under the Supervision of:

Dr. Manish Kumar

Department of Computer Science & Engineering

Punjab Engineering College

(Deemed to be University)

Chandigarh

Submitted By:

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Navdeep Kaur (16103078)

DECLARATION

We hereby declare that the project work entitled “MAP-G” is an authentic record of our own work carried out at Punjab Engineering College (Deemed to be University), as a requirement of 8th semester Capstone project for the award of degree of B.Tech (Computer Science and Engineering), under the guidance of Dr. Manish Kumar (Department of Computer Science and Engineering) during January to May 2020.

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CERTIFICATE

This is to certify that the project entitled MAP-G by Aanshi Bansal, Paritosh Malhotra, Vaibhav Setia, Shreya and Navdeep Kaur is an authentic record of our work carried out under the supervision of Dr. Manish Kumar, Computer Science and Engineering Department, Punjab Engineering College (Deemed to be University), Chandigarh in fulfilment of the requirements as a part of Capstone Project for the award of 06 credits in semester 8 of the degree of **Bachelor of Technology in Computer Science and Engineering**.

Certified that the above statement made by the students is correct to the best of my knowledge and belief.

Dr. Manish Kumar
(Faculty Mentor)
Department of Computer Science and Engineering
Punjab Engineering College
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We would also like to extend thanks to Dr. Neha Sharma, Assistant Professor, Government Home Science College, Sector 10, Chandigarh, guiding Psychologist for the project. She guided us in finalizing the traits and analysing them in a better way.

This project truly wouldn’t have been possible without their mentorship.

ABSTRACT

With the rise of Information Technology, there has been a monumental rise in the number of jobs in the industry. To counter the huge number of applications and to ensure that candidates of proper attitudes are selected, companies have tied up with psychologists to develop games that can quantify and measure favourable traits in the candidates.

This project is an attempt to develop a similar platform for evaluation of teachers, i.e. using Psychometric Games to quantify, measure and evaluate traits that are favourable for teachers to have.

Currently, there is no such framework in use for evaluation of teachers.

Psychometric Games are a highly effective way to filter candidates to find their innate traits. Firstly, the candidates do not know that they are being tested, which ensures that they cannot put up a farce show, as it happens in interviews. Secondly, they provide an effective way to screen a large number of candidates for their psychological mindset, which otherwise is not possible.

A similar framework for teachers has a wide scope of application. It can be used for teacher hiring, evaluation, feedback and to ensure that the correct person enters the teaching field, given that teaching is such a crucial field and affects the future of the country, i.e. children

TABLE OF CONTENTS

CHAPTER 5- RESULTS AND DISCUSSION

CHAPTER 6- CONCLUSION AND FUTURE WORK

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Many people think of the brain as a mystery. They don't know much about intelligence and how it works. When they do think about what intelligence is, many people believe that a person is born smart, average, or dumb and stays that way for life. Bur new research shows that the brain is more like a muscle-it changes and gets stronger when you use it. And scientists have been able to show how the brain grows and gets stronger when you learn.

1.1 Mindset

Mindsets are people's beliefs about human attributes, including abilities. In a fixed mindset, people believe that basic talents and abilities are fixed traits. Some people are well-endowed and some aren't, and you can't do much to change that. However, in a growth mindset, people believe that basic abilities can be developed through hard work, good strategies, and good mentoring (Jennifer *Gunn, Building a Growth Mindset for Teachers, 2018*). People can have different mindsets in different areas, believing that some abilities are fixed but others can be developed. Within any given area, research has shown that people's mindsets play a significant role in their achievement.

Most of the research has been on students' mindsets about their intelligence and abilities. In the research, it has been found that students in a fixed mindset are overly focused on their ability. Research also shows that teaching students a growth mindset changes their motivation and achievement.

1.2 Growth Mindset vs Fixed Mindset

Fostering a growth mindset in students is a priority for most educators, but sometimes teachers themselves operate with a *fixed* mindset. Growth Mindset is the belief that one's abilities, qualities, and intelligence can be developed, while a fixed mindset believes that intelligence and one's qualities are unchangeable. Babies walk, they fall, they get up." Teachers need to show their students that they are a lifelong learner. There has also been work on the impact of teacher's mindsets about students' abilities. Teachers with more fixed mindsets engage in more ability grouping and create more self-fulfilling prophecies when it comes to student achievement.

1.3 Games in Mindset

By merging game-design thinking with trusted and proven psychometric principles, assessment games provide deep insight to inform better hiring decisions, and a rich, immersive experience for the candidate. Instead of asking the candidates to complete a test

that feels like a test, they get to play a series of games. Game-based assessments are perfectly suited for measuring the critical cognitive skills. Gamers typically expend a high degree of cognitive resources whilst playing video and smartphone games, research has revealed. Thus, it is not surprising that games can be adapted to accurately and reliably measure cognitive abilities, as well as job-relevant personality traits. Also, their accuracy is similar (and increasingly higher!) when compared to longer and more repetitive text-based psychometrics. Game-based assessments can accurately evaluate fluid intelligence, working memory, problem solving, creativity etc.

The system we were aiming to develop is to build a comprehensive platform of psychometric games to quantify favourable traits for teachers and generate trait reports for the same and perform analysis on the dataset thus formed to detect patterns and suggest measures for improvement.

CHAPTER 2

BACKGROUND

People who have a growth mindset believe that intelligence can be developed, while people with a fixed mindset believe that intelligence is a fixed trait. People with a fixed mindset think of intelligence kind of like eye colour. They believe that you're born with a certain amount of intelligence, and you can't do much to change that.

People with a growth mindset think of intelligence more like a muscle. They understand that when you put in effort and challenge yourself, you can get smarter, just like when you put in effort at the gym and challenge yourself by lifting heavier weights to make your muscles stronger.

Think about this statement: You can learn new things, but you can't really change your basic intelligence. People who really agree with this statement have a fixed mindset. People who really disagree with this statement have a growth mindset, and, of course, people might be somewhere in the middle. People with a growth mindset had more active brains than people with a fixed mindset when they got feedback that could help them learn. After performing poorly on a test, people with a growth mindset chose to learn from people who did better than them. People with a fixed mindset made them feel better by looking at the scores of people who did worse than them.

2.1 Growth Mindset of Teachers

Growth Mindset Teachers: “Every student has something to teach me” by Carol Dweck. Did they believe that teaching was simply a deep-seated natural ability or did they believe that teaching ability could be substantially improved over time? When they are in a fixed mindset, the child who has trouble learning something is a threat, a threat to the self-concept as a good teacher. In some cases, teachers just blame the child. Similarly, when they are in a fixed mindset, an unmotivated student or a disruptive student is a threat. But in a growth mindset, those students are challenges; they're opportunities to hone their skills, increase understanding, and become a better teacher.

In fact, some teachers tell their students, "Every time you make a mistake, become confused, or struggle, you make me a better teacher." These students go home and boast to their parents, "I really helped my teacher today!" Teachers with growth mindset might set and publicly share teaching goals, reframe deficits as opportunities for growth, ask others for better strategies, seek mentorship, avoid language that implies a fixed mindset about their own abilities, share their own mistakes with students, and vocally embrace it as a chance to get better.

2.2 Why Game based Assessments?

Game-based assessments offer a powerful, candidate-friendly alternative to traditional testing. Games built as games to assess candidates' skills in a quick and engaging experience. Game-based assessments are flexible and can be administered on a standalone basis and are perfectly suited for measuring the critical cognitive skills. Games can be adapted to accurately and reliably measure cognitive abilities, as well as job-relevant personality traits. Games for your brain are a fun way of challenging yourself mentally. Regular training with brain games will keep your brain at its highest level and boost your cognitive performance to its maximum.

2.3 Psychometric Tests

Psychometric tests are a standard and scientific method used to measure individuals' mental capabilities and behavioural styles. Psychometric tests are designed to measure candidates' suitability for a role based on the required personality characteristics and aptitude (or cognitive abilities). They identify the extent to which candidates' personality and cognitive abilities match those required to perform the role. The information collected from the psychometric test is used to identify the hidden aspects of candidates that are difficult to extract from a face-to-face interview.

Game-based assessments can accurately evaluate identify the following favourable traits for a teacher:

- **Fluid Intelligence:** Fluid intelligence is the ability to solve new problems and adapt to unfamiliar situations. In short, fluid intelligence predicts job performance better than any other ability, personality trait, or skill.
- **Working Memory:** Learning processes are underpinned by a specific component of fluid intelligence, which is working memory, or the ability to assimilate and manipulate new information. Learning and professional development potential is dependent upon the integration of new information and so-called crystallized (previously acquired) knowledge. Quickly forming these connections results in an increased ability to apply newly acquired methods or processes to different contexts or situations.
- **Problem-Solving**: Problem-solvers—people who are able to independently identify and systematically apply the most appropriate solutions to new and complex

problems. Sticking with established ways of doing things is no longer sufficient in today's increasingly competitive and dynamic landscape.

- **Creativity:** Intelligence and creativity are intricately linked—intelligent individuals are able to come up with multiple distinct, yet effective solutions to an unfamiliar problem.
- **Learning:** This is a broad category that incorporates knowledge of the cognitive, social and emotional development of learners. It includes an understanding of how students learn at a given developmental level; how learning in a specific subject area typically progresses like learning progressions or trajectories; awareness that learners have individual needs and abilities; and an understanding that instruction should be tailored to meet each learner's needs.

CHAPTER 3

PROPOSED WORK

After studying various psychometric evaluations being used in leading companies, we decided to develop some psychometric games in consultation with psychologists. The performance of the user in these games and the data collected when the user is playing the games (e.g. response time, score, timings of activities etc.) is analysed to quantify the various traits of the user. The games are small in size, the gameplay taking a few minutes in a typical one. Every game is made with the purpose of evaluating a set of traits of the user.

The user doesn't have the knowledge of the traits being measured (or even if they are being measured). The only objective for the player is to play the game to the best of his ability in the time frame given to him/her.

3.1 The traits that we identified for teachers are:

- **Experiment and innovate**
    - ATTRIBUTE: **RISK**
- **Be flexible**
    - ATTRIBUTE: **FLEXIBILITY**
- **Truly Listen**
    - ATTRIBUTE: **OPEN MINDEDNESS**
- **Reflection**
    - ATTRIBUTE: **RESPONSE AND THOUGHT PROCESS**
- **A Growth Mindset**
    - ATTRIBUTE: **ADAPTABILITY**
- **Asking Questions**
    - ATTRIBUTE: **CURIOSITY**
- **Learning new Technology**
    - ATTRIBUTE: **UNDERSTANDING**
- **Analysing Capability**
    - ATTRIBUTE: **CRITICAL THINKING**

- **Taking Charge**
    - ATTRIBUTE: **LEADERSHIP**

The games have been developed using ReactJS on the frontend, coupled with Redux for session management. The games are state-driven, and the session management is handled using redux states are saved along with the times of various activities. The back-end of the applications is based on the Django framework of Python with database Postgres. Django has been chosen because it is robust, with all batteries included. As it is based on Python, the data has been analysed using comparative models. It has been hosted on AWS with the frontend deployed on Amazon S3 which takes the production build and deploys it and the backend has been hosted on Amazon EC2.

Once the games are built, the next step is to get enough users to play them. The more users play them, it builds up the database and provides data on which we can use comparative models to process and provide results and recommendations.

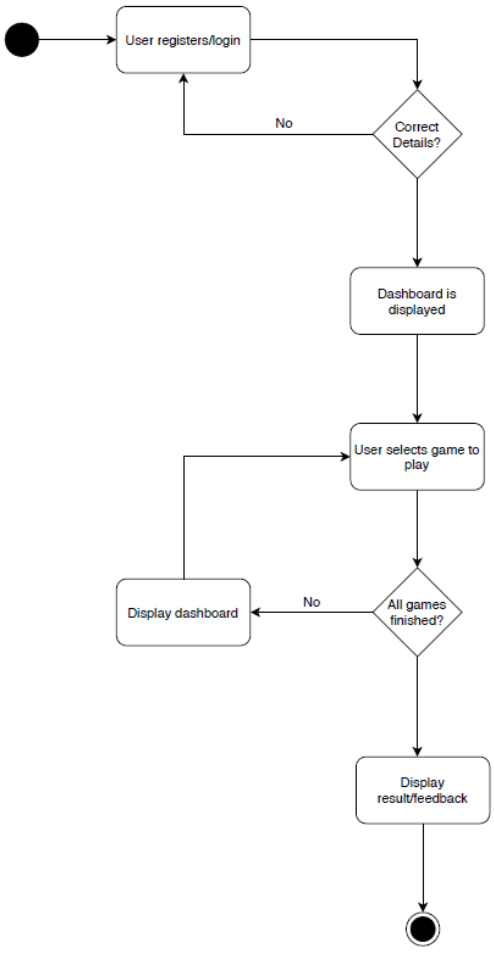

Figure 1: Activity Diagram

3.2 Problem Statement:

The objective of the Project is:

- To research literature and find out the traits that are favourable for teachers to possess.
- To devise small-sized games that can be used to test the traits obtained, in consultation with Psychologists.
- To build a comprehensive platform for the games to quantify favourable traits for teachers and generate trait reports for the same
- To perform analysis on the dataset thus obtained to detect patterns and suggest measures for improvement.

The dataset obtained can be analysed to find correlations, patterns and clusters among the users. The results of the analysis can be provided to the user in the form of reports of his performance. Comparative analysis can also be done within the users, akin to fitness applications, wherein the performance of the users is compared within themselves.

3.3 Methodology:

The games have been developed using ReactJS and Redux are made with the motive that the user's performance in these games can be used to quantify the traits that these games are used to measure. This requires an extensive review of literature to first find out what traits are favourable among teachers. The next step was to research and develop games for each trait, or a game that measures multiple traits. The development is done as a web application portal, into which the user can login and play the various games provided.

- The first constraint during development of games was that the games developed should actually require the traits that are being measured by it. We solved this by consulting with psychologists, to ensure that the games actually measure the traits they are designed to measure.
- The next stage, after the development of the games, was to get a critical mass of users to play the games. The comparative models require data, and that is obtained by users playing the games
- To evaluate the performance of the users, one way was to establish thresholds in the data recorded, to quantify the performance on a scale.

- Another possible way is to have a comparative analysis within the user base, to compare the performances of the users among all the users playing the games. This approach is similar to that used by various fitness apps (e.g. Mi Fit) to provide analysis to the user.

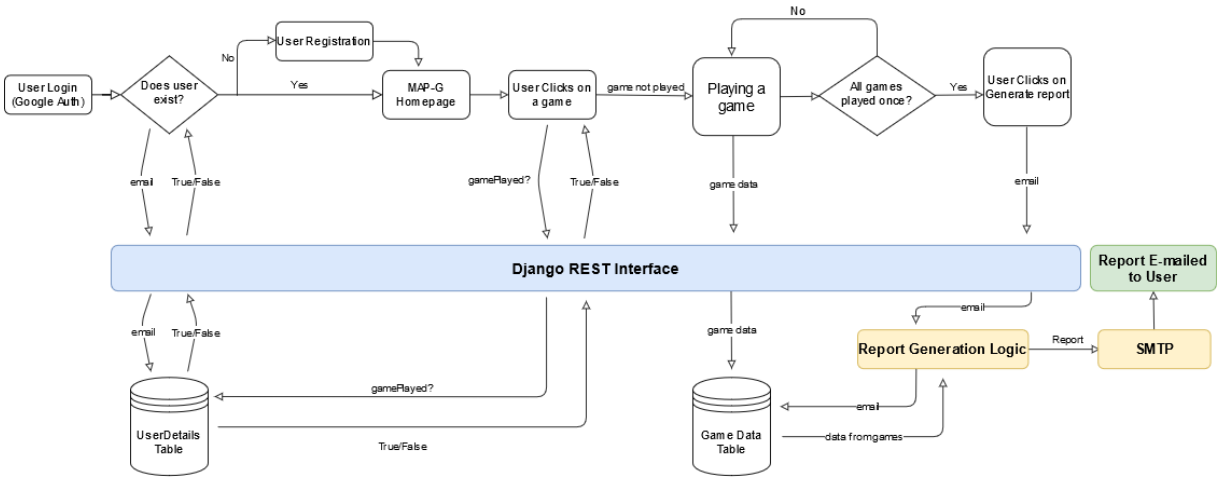

Figure 2: Methodology

CHAPTER 4

IMPLEMENTATION

IMPLEMENTATION

The dashboard displays all the games which the user needs to play and can navigate to any game by selecting the respective name. Before navigating, the user will have to log in from his Gmail account to access the game.

4.1 Logging into MAP-G system via Gmail

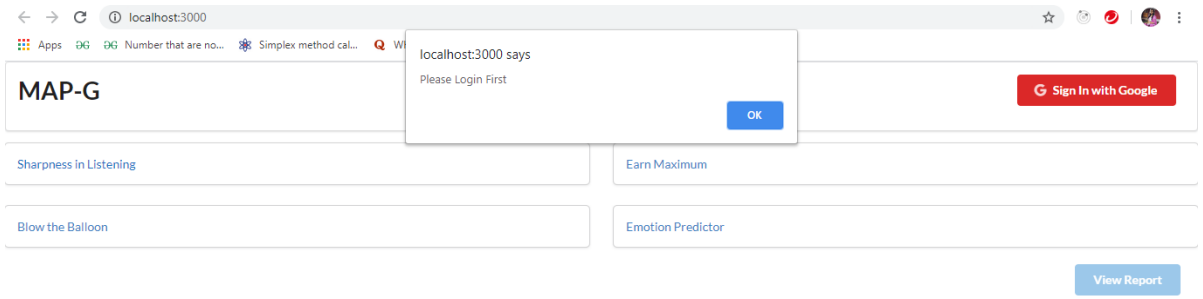

Figure 3: Login

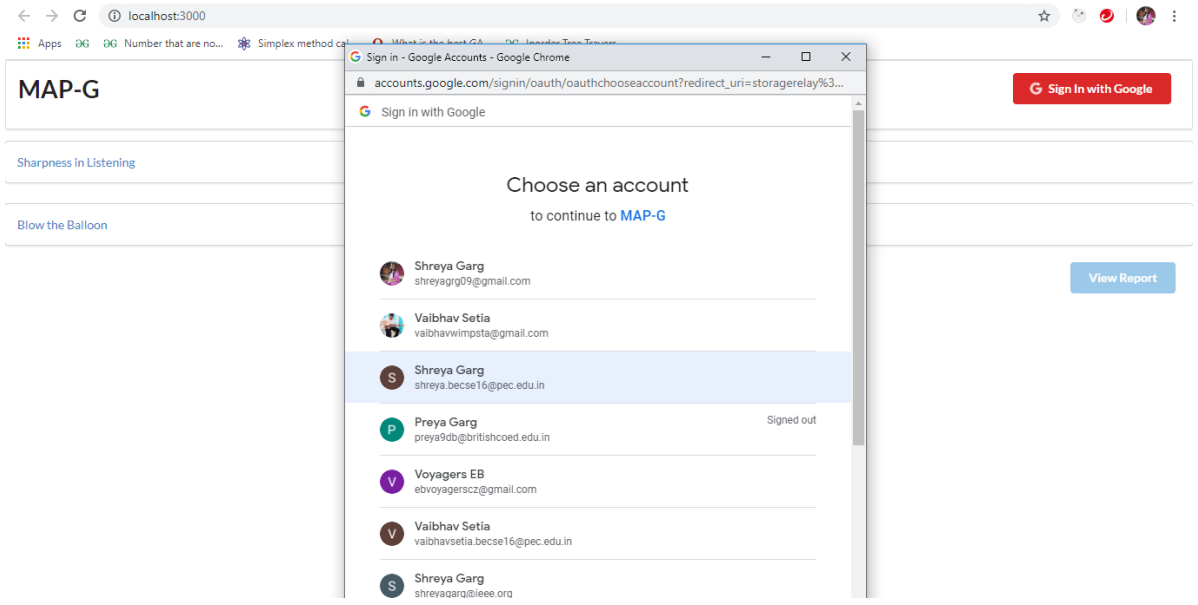

Figure 4: Login

4.2 Filling the details on logging in for the first time

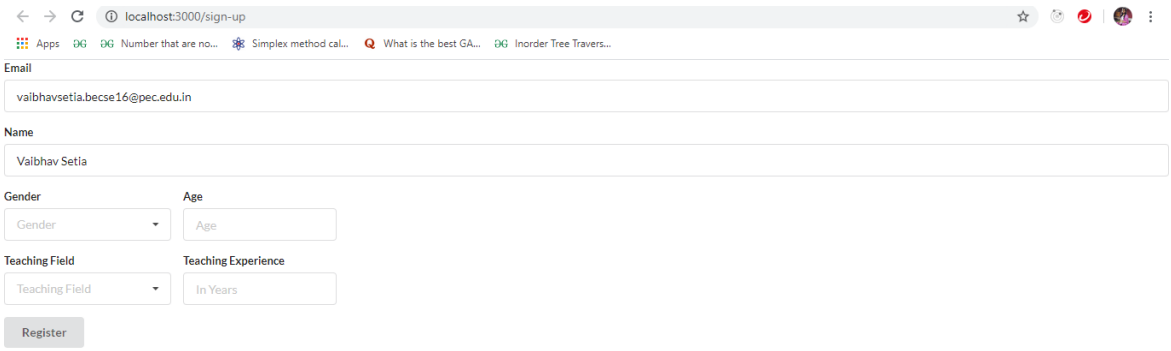

Figure 5: Login

4.3 Selecting Games on Dashboard

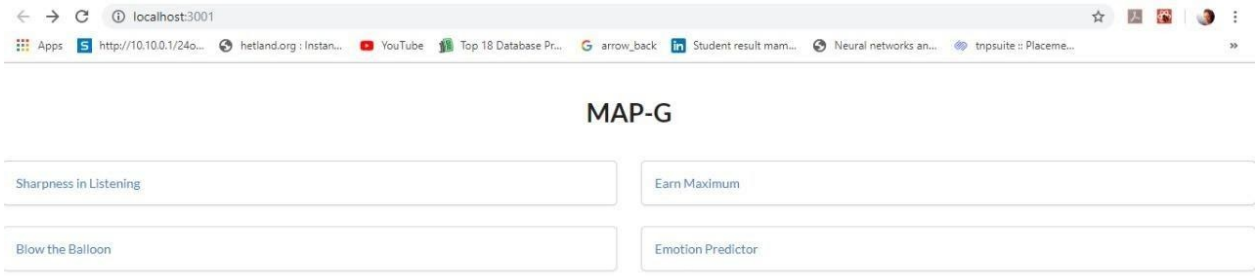

Figure 6: Dashboard

4.4 Playing Sharpness in Listening

Person has to listen to an audio, and on the basis of the audio he has to answer a few questions,

He can play/pause/rewind audio as many times and all the actions are stored and observed.

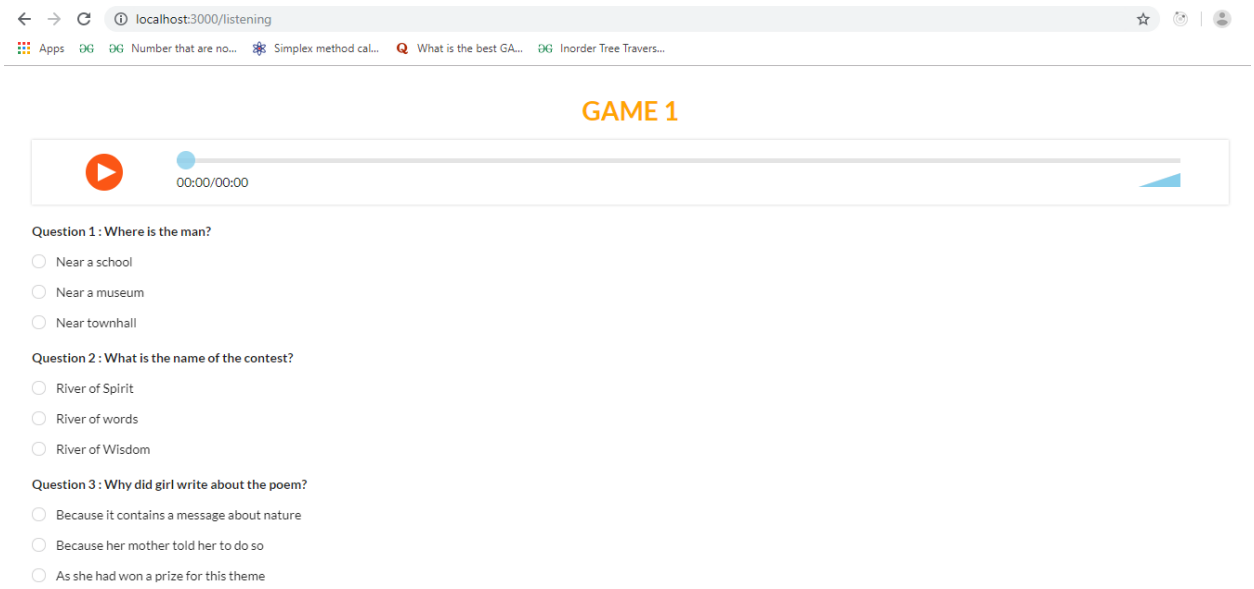

Figure 7: Listening Game

4.5 PLAYING EARN MAXIMUM

Person has to select a pile of cards and a random number amount pops up. The random amount can be negative or positive and the objective of the user is to maximize the amount. Every pile has some characteristics according to which the amount is generated.

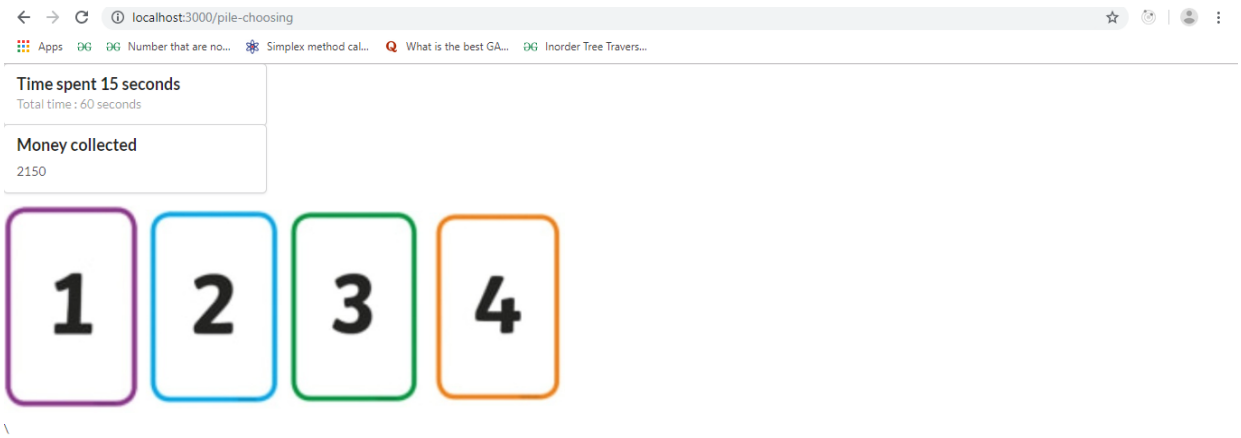

Figure 8: Earn Maximum Game

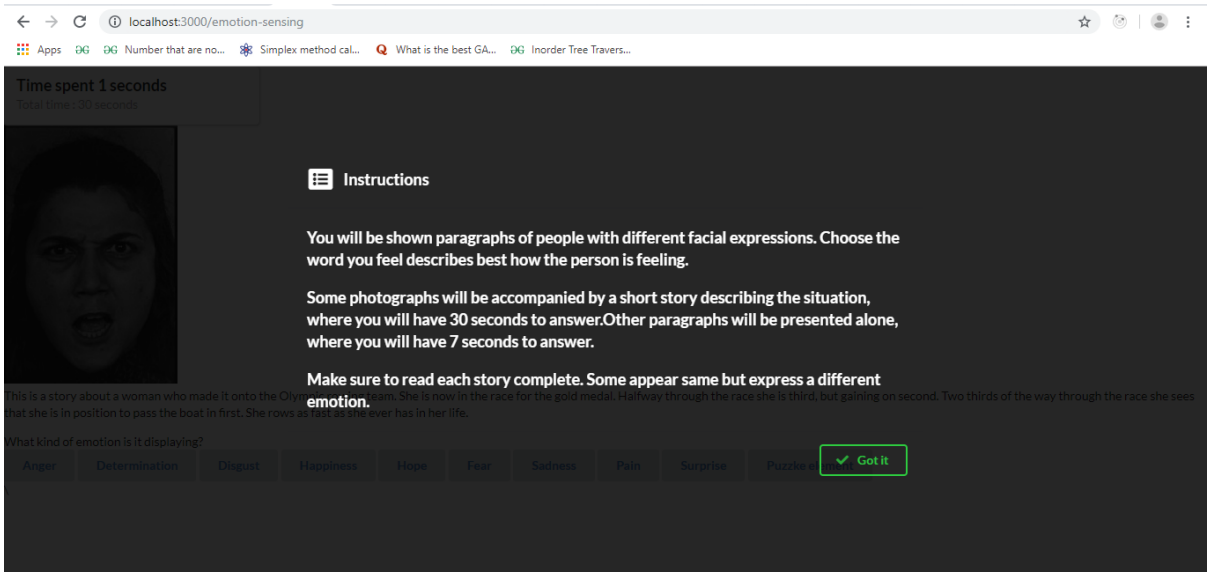

Figure 9: Emotion Predictor Game-1

4.6 PLAYING EMOTION PREDICTOR

Person has to decide the emotion of the person shown in the picture, either by reading the text if provided or by his intuition.

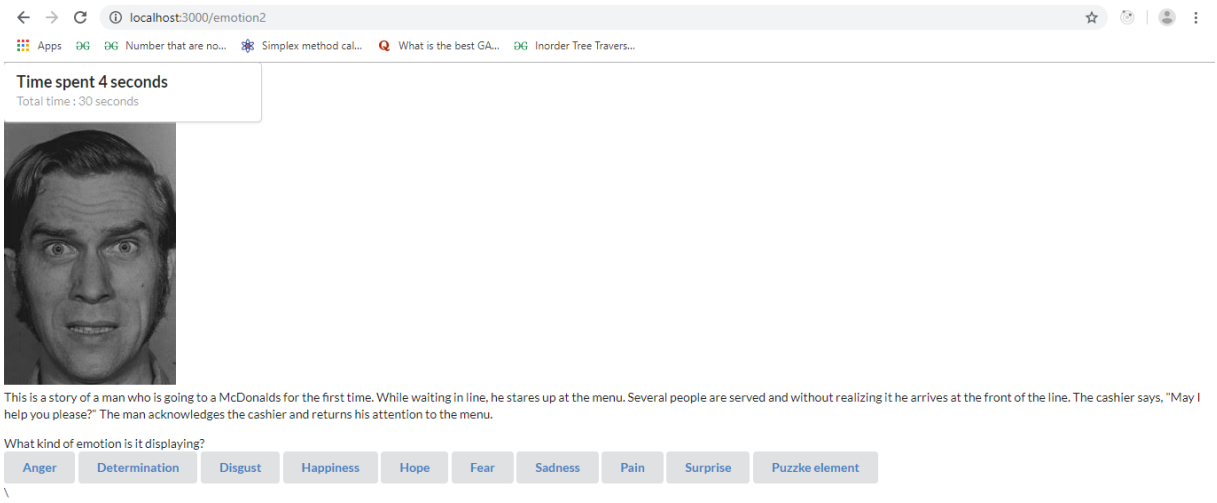

Figure 10: Emotion Predictor Game-2

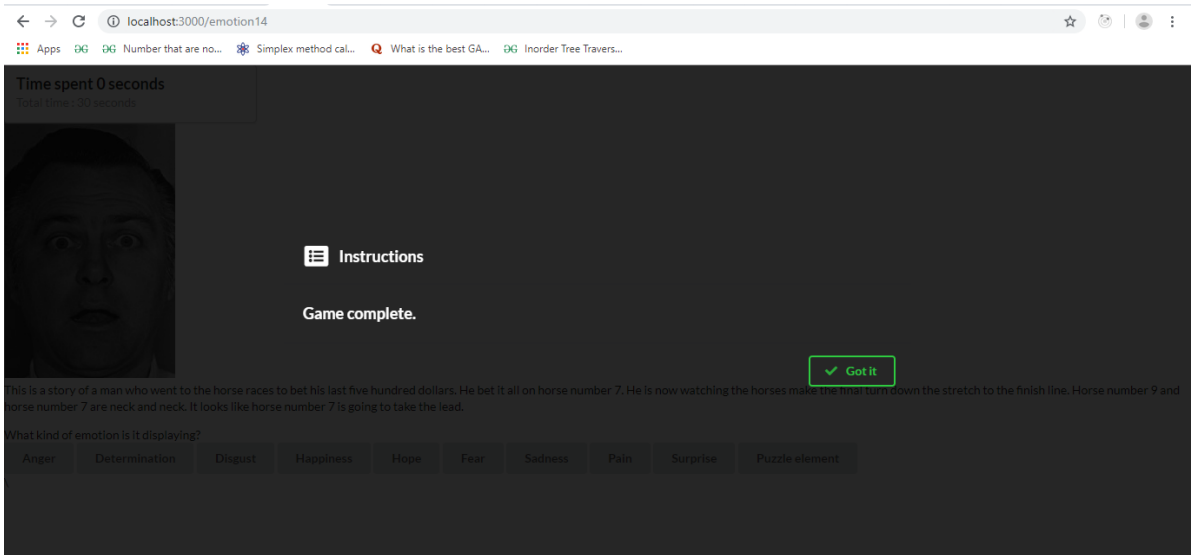

Figure 11: Emotion Predictor Game-3

4.7 BLOW BALLOON GAME:

Person has to blow a balloon, every blow earns a potential amount. If a person collects the amount before the balloon bursts, it is added to his account. Every colour balloon follows a certain characteristic pattern.

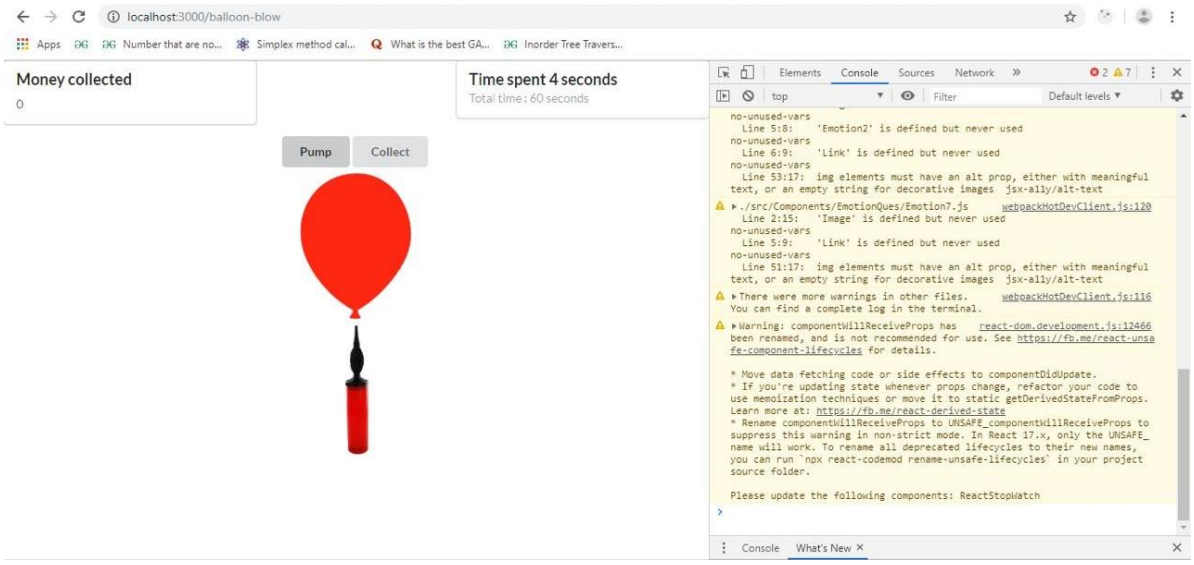

Figure 12: Blow Balloon Game -1

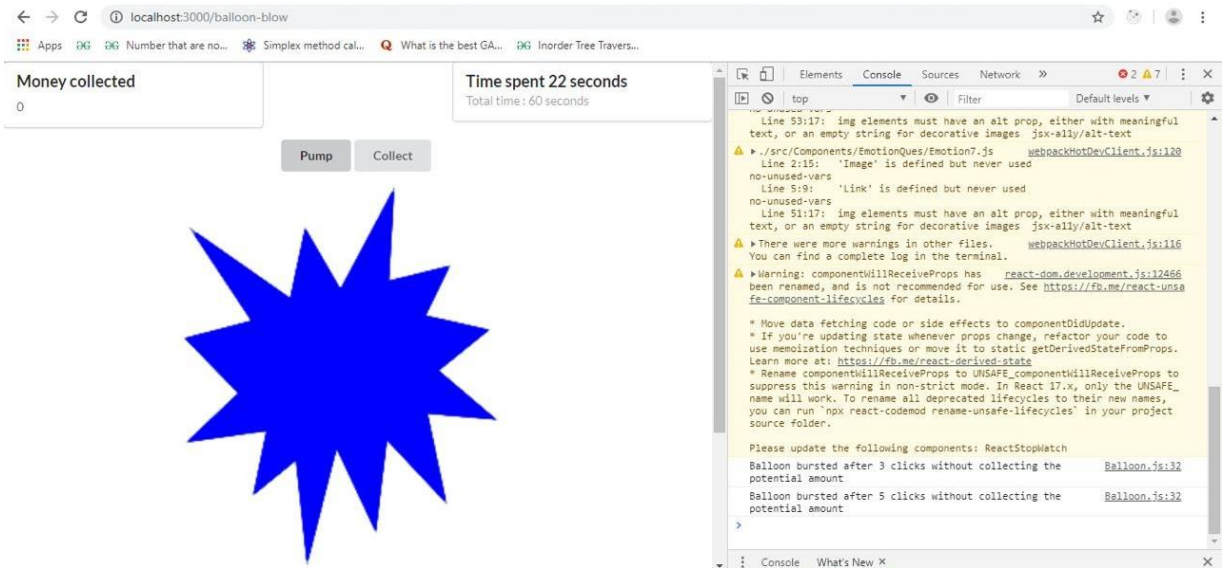

Figure 13: Blow Balloon Game -2

4.8 Generating Report

On clicking generate report button the report in the following format is generated

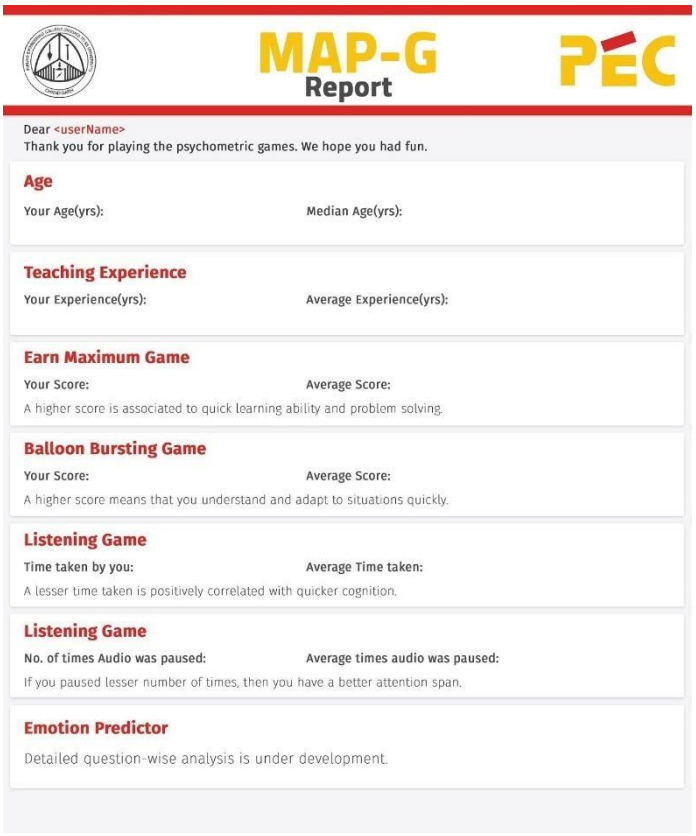

Figure 14: Report Generation

4.9 Storing data on Backend

i.USER DATA


```
[
    {
        "emailId": "ebvoyagerscz@gmail.com",
        "audioStart": [
            "0",
            "12:03:27 PM",
            "12:03:29 PM",
            "12:03:31 PM",
            "12:03:42 PM",
            "12:03:50 PM",
            "12:03:51 PM",
            "12:03:53 PM",
            "12:12:46 PM",
            "12:13:11 PM",
            "12:16:04 PM"
        ],
```

```
{
    "email": "ebvoyagerscz@gmail.com",
    "name": "Voyagers EB",
    "age": 27,
    "teachingExp": 4,
    "teachingField": 2,
    "openID": "112780732191938856088",
    "gender": 2,
    "games_played": [
        false,
        true,
        true,
        true,
        true
    ]
},
```

```
{
    "email": "vaibhavwimpsta@gmail.com",
    "name": "Vaibhav Setia",
    "age": 22,
    "teachingExp": 2,
    "teachingField": 2,
    "openID": "106905864720884456841",
    "gender": 1,
    "games_played": [
        false,
        true,
        true,
        true,
        true
    ]
}
```


ii. LISTENING GAME


```
"audioPause": [
    "0",
    "12:03:29 PM",
    "12:03:30 PM",
    "12:03:42 PM",
    "12:03:49 PM",
    "12:03:51 PM",
    "12:03:53 PM",
    "12:03:55 PM",
    "12:13:10 PM",
    "12:13:19 PM",
    "12:16:51 PM"
],
```

```
"audioAdjust": [
    "0",
    "12:03:29 PM",
    "12:03:29 PM",
    "12:03:29 PM",
    "12:03:29 PM",
    "12:03:29 PM",
    "12:03:29 PM",
    "12:03:29 PM",
    "12:03:29 PM",
```

```
"audioEnd": [
    "0",
    "12:03:55 PM",
    "12:13:19 PM",
    "12:16:51 PM"
],
```

```
"answers": [
    [
        "0",
        "0",
        "0"
    ],
    [
        "1",
        "B",
        "12:16:54 PM"
    ],
    [
        "2",
        "B",
        "12:16:56 PM"
    ],
    [
        "3",
        "A",
        "12:16:57 PM"
    ]
]
```


iii. BALLOON BLOW


```
{
    "emailId": "ebvoyagerscz@gmail.com",
    "color": [
        0,
        1,
        2,
        0,
        1,
        2,
        0,
        1,
        2,
        0,
        1,
        2,
        0,
        1,
        2
    ],
```

```
"clicksBursted": [],
"clicksCollected": [
    3,
    0,
    2,
    0,
    0,
    3,
    0,
    0,
    2,
    3,
    0,
    0,
    0,
    0,
    0
],
"amountCollected": [],
"total": 130
```

iv. PILE CHOOSING


```
{
    "emailId": "shreyagarg@ieee.org",
    "pile": [
        1,
        2,
        3,
        4,
        3,
        2,
        1,
        2,
        2,
        3,
        3,
        4,
```

```
"scores": [
    100,
    50,
    -60,
    10,
    -30,
    60,
    -150,
    200,
    -170,
    100,
    -160,
```

```
    "total": 2608
},
```


v. EMOTION PREDICTOR


```
{
    "emailId": "shreyagrg09@gmail.com",
    "answers": [
        [
            "1",
            "Hope",
            "12:10:49 PM"
        ],
        [
            "2",
            "Disgust",
            "12:10:52 PM"
        ],
        [
            "3",
            "Puzzle",
            "12:11:00 PM"
        ],
        [
            "4",
            "Disgust",
            "12:11:02 PM"
        ],
        [
            "5",
            "Determination",
            "12:11:08 PM"
        ],
```

```
    "6",
    "Fear",
    "12:11:12 PM"
],
[
    "7",
    "Surprise",
    "12:11:17 PM"
],
[
    "8",
    "Fear",
    "12:11:19 PM"
],
[
    "9",
    "Surprise",
    "12:11:21 PM"
],
[
    "10",
    "Fear",
    "12:11:24 PM"
],
[
    "11",
    "Fear",
    "12:11:26 PM"
```

4.10 WEB HOSTING

Both the front end and backend are hosted on Amazon AWS using the free tier usage provided by amazon.

4.10.1 FRONT END

Front End has been hosted on AWS S3 bucket.A 3rd party app Buddy has been used to automatically deploy new builds from the code being pushed to Github.

The URL for frontend is: http://map-g.s3-website.ap-south-1.amazonaws.com/

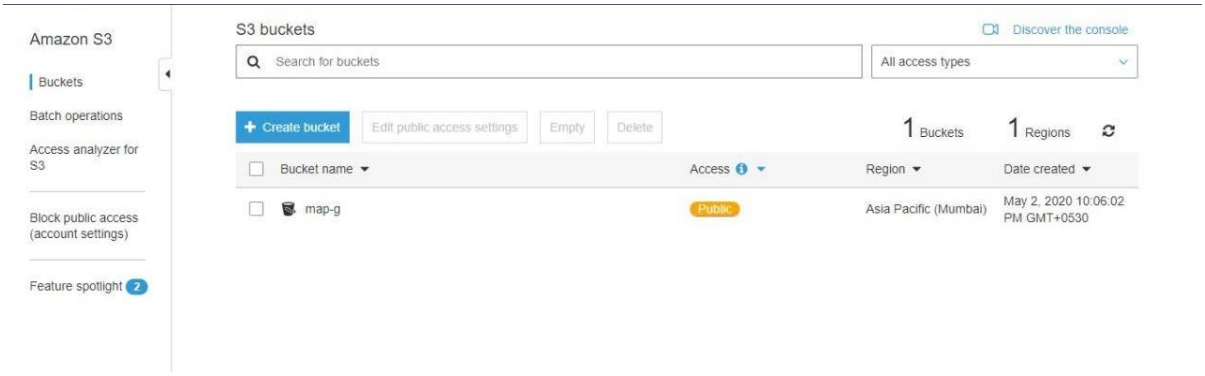

Figure 15: AWS S3 Instance

4.10.1 BACK END

Back End has been hosted on AWS Ec2 instance. The linux instance runs a Django rest framework on it captures all the requests from the front end.

The IP address for backend is: http://54.224.51.29/

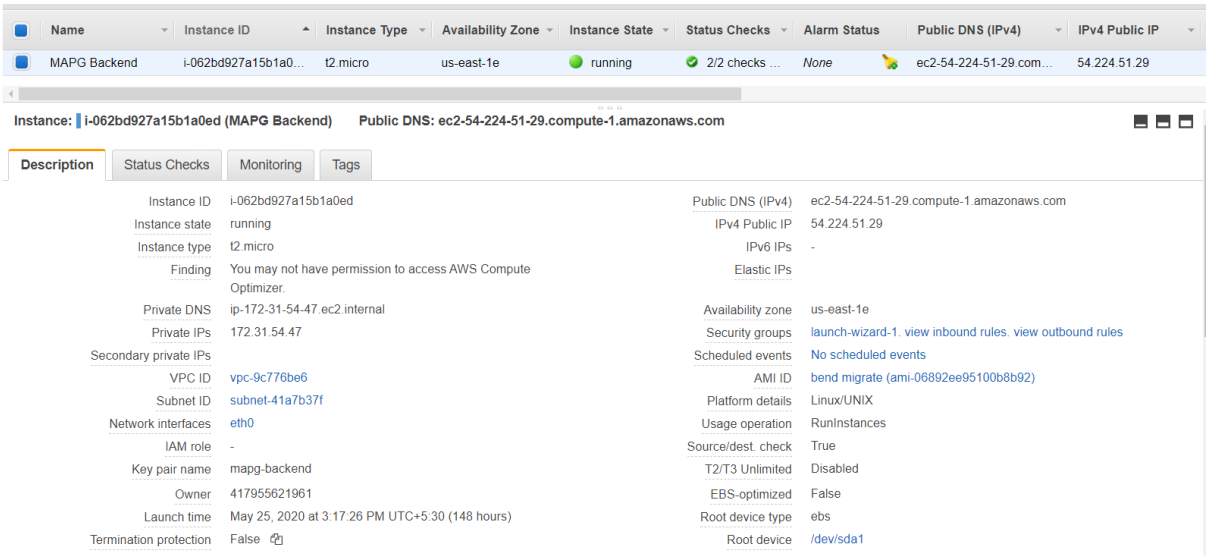

Figure 16: AWS Ec2 Instance

4.11 LANGUAGES AND FRAMEWORKS USED:

The app built is a full stack app. The technologies and softwares used to build and host the app are as follows:

4.11.1 FRONT END TECH STACK

Also referred to as “CSS frameworks,” these are packages containing pre-written, standardized code in files and folders. They give you a base to build on while still allowing flexibility with the final design.

4.11.1.1 HTML

Figure 17: HTML Logo

Hypertext Markup Language (HTML) is the standard markup language for creating webpages and web applications. With Cascading Style Sheets (CSS) and JavaScript it forms a triad of cornerstone technologies for the World Wide Web. HTML code ensures the proper formatting of text and images so that your Internet browser may display them as they are

intended to look. HTML also provides a basic structure of the page, upon which Cascading Style Sheets are overlaid to change its appearance.

4.11.1.2 Cascading Style Sheets (CSS)

Figure 18: CSS Logo

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language. It has been used to define the front-end styling of various extension components. Styling of all pages has been done with the help of CSS.
The Styling of the webpages in the project has been done using CSS.

4.11.1.3 JavaScript

Figure 19: JavaScript Logo

JavaScript is a programming language that adds interactivity to the website. JavaScript is a full-fledged dynamic programming language that, when applied to an HTML Document, can provide dynamic interactivity on websites. It is an interpreted programming language with object-oriented capabilities. JavaScript is the primary language to add interactivity on the web and is used in conjunction with ReactJS and Redux.
JavaScript has been used for creating the page templates and for alert boxes.

4.11.1.4 ReactJS

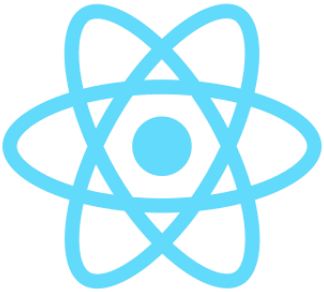

Figure 20: ReactJS Logo

ReactJS is a JavaScript library for building user interfaces. It is maintained by Facebook and a community of individual developers and companies. ReactJS can be used as a base in the development of single-page or mobile applications, as it is optimal for fetching rapidly changing data that needs to be recorded.

ReactJS bundles HTML, CSS and JavaScript into a single component, which can be hot reloaded and can be reused across different ReactJS applications.

4.11.1.6 Redux

Figure 21: Redux Logo

Redux helps write applications that behave consistently, run in different environments (client, server, and native), and are easy to test. Redux is an open-source JavaScript library for managing application state. ReactJS is a state-driven JavaScript library and it uses the application state to keep track of the execution status. Redux is used to manage the state of ReactJS applications. It is most commonly used with ReactJS or Angular for building user interfaces

4.11.1.6 AWS S3 and Buddy

Figure 22: AWS S3 Logo

Amazon Simple Storage Service (Amazon S3) is an object storage service that is used for hosting front end. It offers industry-leading scalability, data availability, durability, security, and performance. Customers of all sizes and industries can use it to store and protect any amount of data for a range of use cases, such as websites, mobile applications, backup and restore, archive, enterprise applications, IoT devices, and big data analytics.

4.11.7 Django REST framework

Figure 23: Buddy Logo

Buddy is a web-based and self-hosted continuous integration and delivery software for Git developers that can be used to build, test and deploy web sites and applications with code from GitHub, Bitbucket and GitLab.employs Docker containers with pre-installed languages and frameworks for builds, alongside DevOps, monitoring and notification actions.

4.11.2 BACK END TECH STACK

Server-side web frameworks (a.k.a. "web application frameworks") are software frameworks libraries that simplify common web development tasks, including routing URLs to appropriate handlers, interacting with databases, supporting sessions and user authorization.

4.11.2.1 Django

Figure 24: Django Logo

Django is a Python-based free and open-source web framework, which follows the model-template-view architectural pattern. It is maintained by the Django Software Foundation, an independent organization established as a 501 non-profit. Django's primary goal is to ease the creation of complex, database-driven websites.

Django is one of the most robust web frameworks and comes with all batteries included. It can be used for rapid prototyping of web applications with minimal effort. It also plays well with ML applications, as it is Python-based.

4.11.2.2 Django REST framework

Figure 25: Django Rest Framework Logo

REST stands for Representational State Transfer. RESTful APIs are a structured set of HTTP resources. Those resources describe functions/database models and perform manipulation upon those structures via a set of standard HTTP requests.

These standards specify how URLs should be structured and what functions should happen based on a given HTTP method.

4.11.2.3 Python 3

Figure 26: Python 3 Logo

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It supports functional and structured programming methods as well as OOP. It can be used as a scripting language or can be compiled to byte-code for building large applications. It provides very high-level dynamic data types and supports dynamic type checking and also supports automatic garbage collection. It can be easily integrated with C, C++, COM, ActiveX, CORBA, and Java.

4.11.2.4 Postgres Database

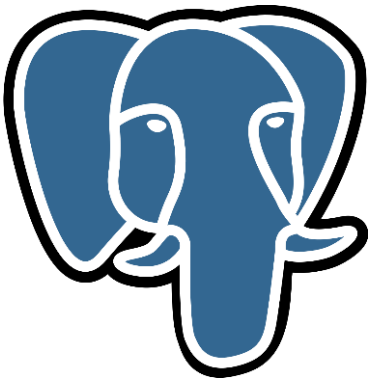

Figure 27: PostGres SQL Logo

PostgreSQL is a powerful, open source object-relational database system that uses and extends the SQL language combined with many features that safely store and scale the most complicated data workloads. PostgreSQL has a strong architecture, reliability, data integrity, robust feature set. It runs on all major operating systems, and has powerful add-ons such as the popular PostGIS geospatial database extender.

4.11.2.5 AWS EC2

Figure 28: AWS EC2 Logo

Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) cloud. Using Amazon EC2 eliminates your need to invest in hardware up front, so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic.

CHAPTER 5

RESULTS & DISCUSSION

5.1 COLLECTING DIFFERENT ATTRIBUTES OF EACH GAME

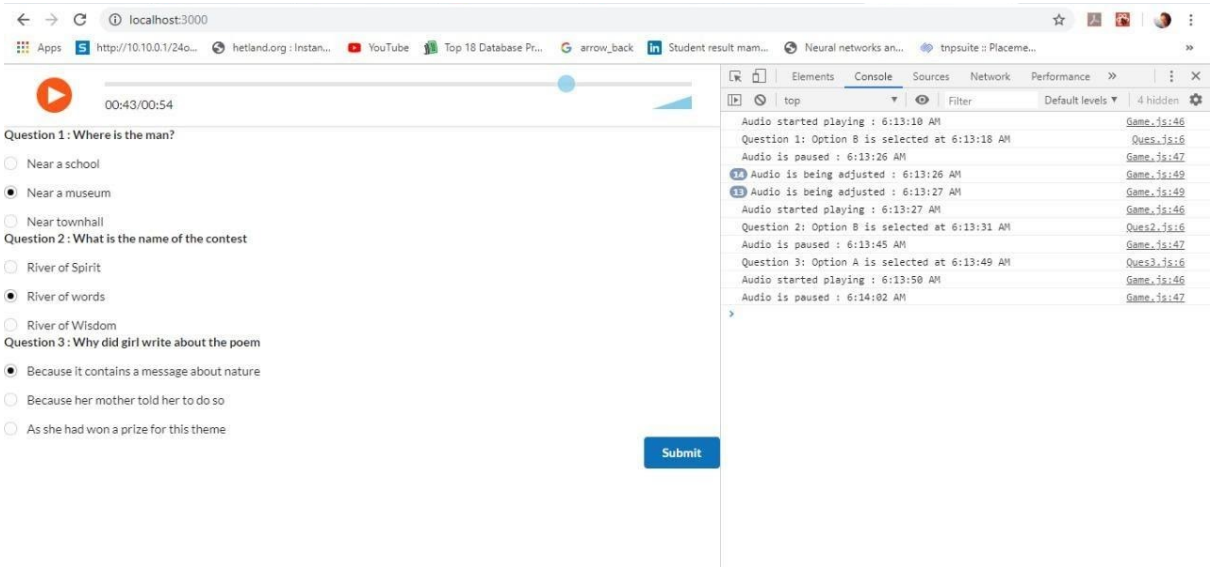

Figure 29: Attributes: Listening Game

Attributes collected for **Sharpness in Listening**:-

- Number of times start/stop of audio.
- Correct answer or not
- Number of times answer was changed
- When was the question answered

  Traits Measured: Critical Listening, Understanding Capability

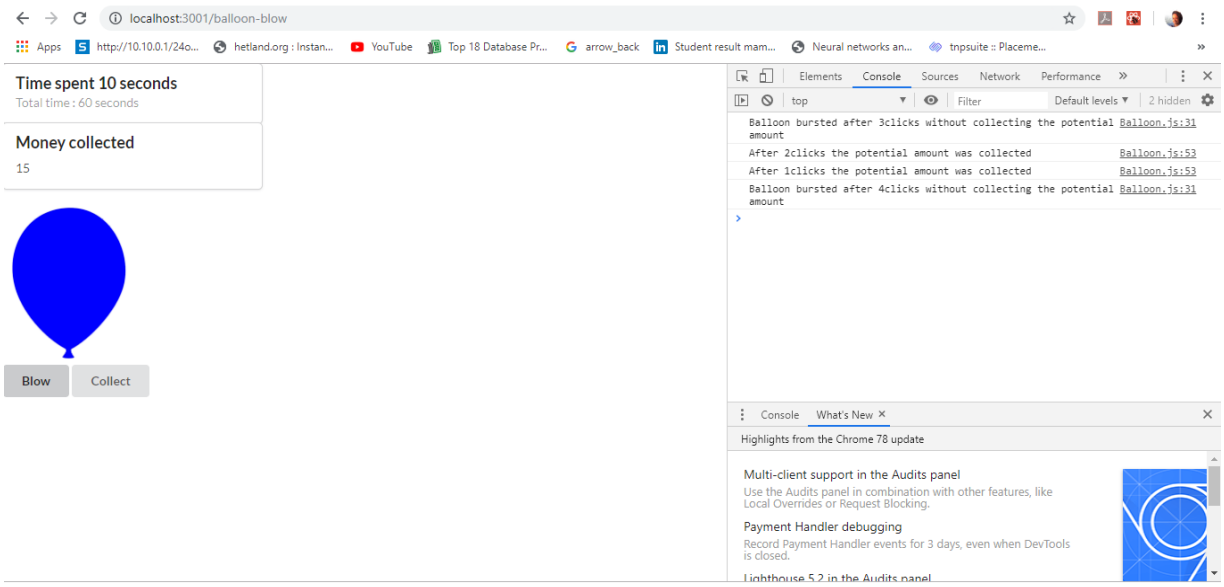

Figure 30: Attributes: Blow the Balloon

Attributes collected for **Blow the Balloon**:-

- Number of clicks a balloon is blown to
- Balloon collected or burst
- Which kind of balloon is collected

Traits Measured: Risk, Learning Capability

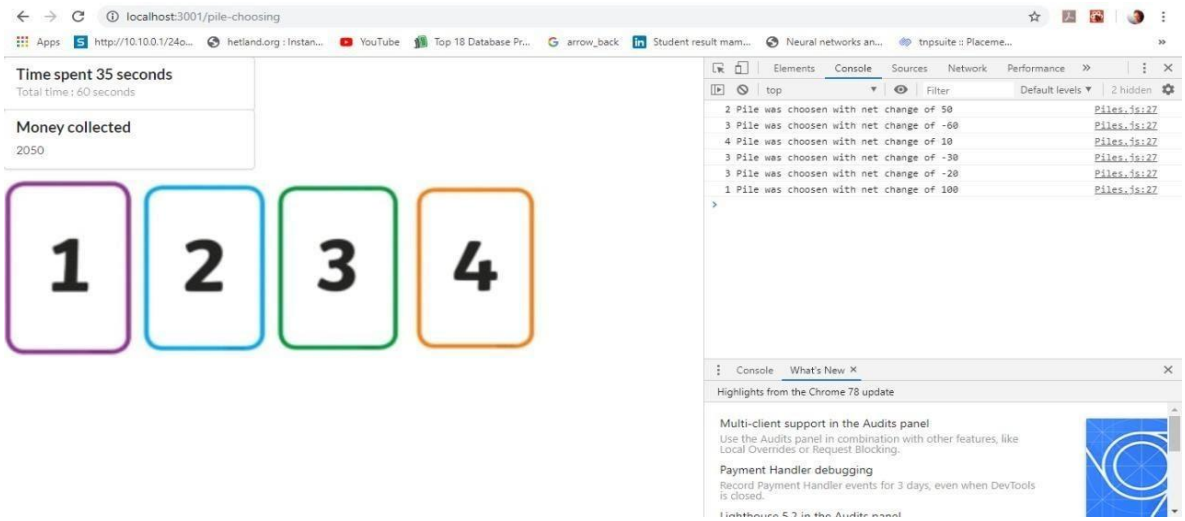

Figure 31: Attributes: Earn Maximum Game

Attributes collected for **Earn Maximum**:-

- Which Pile clicked
- A positive change or negative
- Total money collected

Traits Measured : Risk , Behavioural analysis

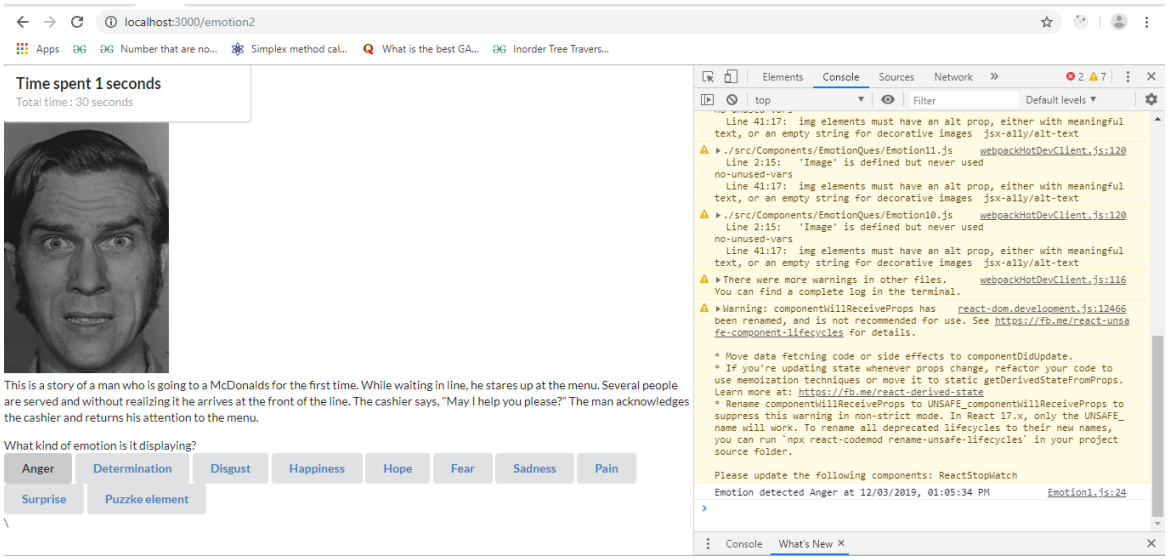

Figure 32: Attributes: Emotion Predictor Game

Attributes collected for **Emotion Predictor**:-

- Which emotion selected
- Time taken to choose the emotion

Traits Measured: Personality reflection, Face study

5.2 Discussions

In consultation with Dr. Neha Sharma, Assistant Professor, Gov. Home Science College, Sector 10 all these attributes of various games have been chosen.

After having meetings with her twice a week, we discussed various traits for evaluation of teachers, we in consensus with her we have developed 5 major games to measure the traits of:

1) Personality reflection and face study- It is important that the teachers know about the mental state of students by looking at their face

2) Learning Capability- It is important that the teachers learn themselves in order to make the students learn.

3) Risk- Important that the teachers take risk themselves in order to inspire students to take risk

4) Listening & Understanding - It is important to know how well teachers listen and understand another's point of view

5.3 Report Output

Figure 33: Report Output

In consultation with **Dr. Neha Sharma** it was decided to go for comparative analysis as suggesting a quantitative analysis for the same is not possible.

Following the same lines, the data has been analysed using comparative models in Django. The results of the report are explained as:

1. In the earn Max game the player needs to collect maximum money in a limited time from 4 piles where the behaviour of each pile is different and a higher score indicates

that the person is not only able to grasp the logic quickly but also aces problem solving capabilities nicely

2. The balloon bursting game is made with the purpose to collect max money before the balloon bursts as if it bursts then the money collected for that balloon would be zero. Each balloon exhibits a different behaviour but there is similarity in behaviour of balloons of one colour, so more is the score it indicates the person can understand and adapt to changing situations quickly.
3. Listening Game is a concentration test. The person needs to listen to an audio before answering certain questions related to it. The audio can be adjusted and paused as many times the user wants, but this audio adjustment pause gives an idea of how much time the user is taking for comprehending a basic audio and after that there are 3 questions to be answered which tells about the accuracy. If the audio is paused a lesser no of times with correct answers it indicates more attention.
4. Emotion Predictor Game The data of the emotion game is still under analysis and development as the game provides a series of ambiguous emotions and it can be analysed after getting some sufficient amount of data

CHAPTER 6

CONCLUSION & FUTURE WORK

6.1 CONCLUSION

MAP-G is a framework that adapts from psychometric tests and expands them to a sphere they are not currently being used in: to evaluate the mindset of teachers and candidates who aspire to be teachers someday.

It has the potential for a wide variety of Applications, like evaluating prospective candidates for teaching positions, mindset analysis of present teachers etc. It can also be incorporated into teacher feedback systems to better reflect the suitability of the teacher for the subject and for the general profession of teaching.

6.2 FUTURE SCOPE:

1. **Analysis of the data**

   Can be furthered using ML techniques, like K-nearest neighbours to identify the correlations and patterns in it

2. **Recommendations for improvement**

   After the comparative analysis is complete we can suggest the users some activities/measures/resources to improve upon the underlying ability that a particular game targets. Eg: A low score in listening game indicates lack of concentration that can be improved upon by mediation.

3. **Emotion predictor game analysis**

   As the questions in the emotion predictor game have no correct answer hence a detailed comparative analysis of emotion predictor game requires considerable amount of data

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