

**Motivation/Problem statement:**

Choosing an EduPath is crucial for every student as it determines their future earnings and quality of life. Many students are unaware of their interests and need guidance to explore their options. It is important to consider personal aspirations rather than follow family or peer pressure. Making the wrong career choice can lead to failure, unemployment, and depression. Therefore, seeking career counseling can help students make informed decisions and avoid failure. EduPath aims to solve this by providing personalized career guidance. Overcoming these hurdles is crucial for ensuring accurate recommendations and empowering students to make satisfying educational and career choices.

## ABSTRACT

Providing secondary school students with early and ongoing exposure to career-related experiences and information is crucial for their future success. While career counsellors play a vital role in this process, not all schools have the privilege of having dedicated professionals. It is essential for schools to recognize the value of adequate career guidance and allocate resources and support to ensure that every student has access to the necessary guidance to make informed decisions and connect their academics with their future aspirations. By investing in career guidance, we can empower the next generation to thrive in their chosen careers and contribute meaningfully to society.

Effective career guidance is pivotal in helping individuals navigate the complex world of careers and make informed decisions about their future. By considering the individualized needs of students, adopting a holistic assessment approach, and providing access to comprehensive information, we can enhance the overall effectiveness of career guidance programs. The mobile application solution developed through the Agile methodology serves as an innovative tool to introduce students to different career paths and assist them in their career planning journey. With continuous improvements and enhancements, we can provide students with the necessary guidance they need to thrive in the ever-evolving job market.

**Key Words:** Java, XML, TensorFlow, Recycler View

**Chapter No.1**

**INTRODUCTION**

## **1.1 PROJECT BACKGROUND**

EduPath addresses the common struggles students face in making career decisions due to a lack of guidance and awareness. The challenge lies in students often selecting streams without understanding the breadth of opportunities available, leading to dissatisfaction. The proposed EduPath system aims to alleviate these challenges by offering personalized career guidance and make informed choices. EduPath's success is contingent on addressing these challenges effectively, ensuring a balanced integration of technology and personalized counselling. Additionally, the system should counterbalance external pressures and foster a genuine alignment between individual aspirations and chosen career paths. By doing so, EduPath not only aids students in making satisfying educational choices but also provides a valuable resource of Scholarship data, Competitive Exam data and College data, enhancing its potential impact on future generations.

### **1.1.1 Impact of Social Expectations**

The societal influence on students career decisions poses a significant challenge, as the pressure from family, peers, and cultural norms often shapes choices. Students, driven by external expectations, may opt for paths aligned with societal norms rather than their genuine interests. This phenomenon contributes to a misalignment between personal aspirations and chosen career paths. EduPath aims to address this challenge by integrating mechanisms that recognize and counterbalance social expectations. By fostering self-awareness and emphasizing individual values, the system endeavours to guide students towards careers that align not only with societal norms but also with their intrinsic passions, fostering a more authentic and satisfying career decision-making process. This thesis explores the nuanced impact of social expectations on career choices and underscores the importance of EduPath in navigating and mitigating these influences for more informed and personally fulfilling decisions.

## **1.2 PROBLEM STATEMENT**

Choosing an EduPath is a significant decision for students as it shapes their future earnings and overall quality of life. Many students find themselves unsure about their interests and need proper guidance to explore the various career options available to them. It becomes vital to consider one's personal aspirations rather than succumb to familial or peer pressure when making this important decision.

Opting for the wrong career path can lead to challenges such as failure, unemployment, and even feelings of depression. Recognizing the potential consequences, it becomes clear that seeking career counselling is a crucial step for students. Career counselling provides the necessary support for students to make informed decisions, ensuring they avoid pitfalls and setbacks in their educational and career journeys.

EduPath serves as a solution to this common challenge by offering personalized career guidance. By addressing individual interests, skills, and aspirations, EduPath aims to provide accurate recommendations tailored to each student. Overcoming the hurdles in career decision-making is essential, and EduPath strives to empower students with the knowledge and guidance needed to make satisfying and fulfilling choices for their education and future careers. The goal is to pave the way for students to embark on a path that aligns with their strengths and passions, fostering success and personal fulfilment in the long run.

## **1.3 PURPOSE OF STUDY**

EduPath: Personalized Educational and Career Guidance serves as a crucial solution to the common challenge faced by Students confusion regarding career choices in Engineering field. Many students lack proper guidance and awareness about which branch is suitable for best career option of the diverse career opportunities available, leading them to choose paths that may not align with their interests. The Career Guidance system steps in as a valuable resource, offering detailed career insights to help students make informed decisions. This EduPath system goes beyond more assistance; it becomes a catalyst for students to make appropriate, satisfying, and interesting educational and occupational choices in selecting their careers. EduPath's role in the career decision-

making phase is pivotal. It offers a wealth of tools and data tailored for students interested in various Engineering fields. The application streamlines the decision process, eliminating the need for extensive research. It simplifies the exploration of a wide array of options, ensuring that students make well-informed decisions effortlessly. The system's initiation involves selecting a career for students based on an interest approach.

Personality-based questions gauge a student's preferences, knowledge of subjects, intelligence, skills, and interest in Engineering fields. Unlike traditional methods, EduPath doesn't rely on academic scores, it takes into account the individual's personality, providing a comprehensive recommendation about colleges and competitive exams regarding engineering fields like General Aptitude in Engineering (GATE), Maharashtra Common Entrance Cell Test (MHTCET) and many more. The application conducts a variety of tests, and the Machine Learning Algorithm Model predicts future career options, offering insights into competitive exams and suggesting suitable Engineering colleges for admission. In leveraging Machine Learning Algorithms, EduPath emerges as a powerful tool that accurately predicts career data. This predictive capability empowers students to choose the right path in the Engineering field, fostering a seamless transition from education to a fulfilling career. In essence, EduPath plays a transformative role in guiding students toward their professional journeys and contributing to their overall success.

**Objectives:**

- To Understand the problem facing by 12<sup>th</sup> Students and make it is easy to choose a right career path in the field of Engineering.
- To Convert the Skills, Interest of field into the Prediction format.

## **1.4 TECHNOLOGIES BASE**

This Project be implemented by using various technologies like

### **1.4.1 Java**

Java is a computer language and platform that was first introduced by Sun Microsystems in 1995. Since then, it has grown to become a crucial part of the digital world, providing a reliable foundation for many services and applications. Even today, new, and innovative digital products rely on Java for their development. While most modern Java applications combine the Java runtime and the application itself, there are still some websites and applications that won't work unless you have Java installed on your computer. This website, Java.com, is designed for people who still need Java for certain desktop applications, particularly those targeting Java 8.

#### **Features:**

- **Platform-Independent:** Java is platform-independent, meaning you can write the code once and run it anywhere. The code you write on one system can be executed on another without modification.
- **Object-Oriented:** Java follows an object-oriented programming (OOP) approach, where everything is treated as an object. This makes it easier to organize and structure code.
- **Simple and Easy to Learn:** Java was designed to be simple, making it easier for programmers to learn and use. It omits complex features and emphasizes a clean syntax.
- **Automatic Memory Management:** Java has a built-in garbage collector that automatically manages memory. It deallocates memory occupied by objects that are no longer in use, reducing the risk of memory leaks.

### **1.4.2 Machine Learning**

Machine learning is a branch of artificial intelligence and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy. Machine learning is a big deal in the world of data science. It uses math and computer tricks to teach computers to make guesses or find important things in big piles of data. To make the smart software that does this, we use tools like TensorFlow and PyTorch.

#### **Features:**

- **Prediction and Classification:** In simple terms, machine learning helps computers make predictions or classify things. It's like teaching a computer to recognize patterns and use that knowledge to guess what might happen next.
- **Decision Making:** Machine learning enables computers to make decisions based on data. Imagine having a smart assistant that learns from your preferences and suggests what movie to watch or which restaurant to try, making your decisions easier.

### **1.4.3 TensorFlow**

TensorFlow is a free and open-source software library for machine learning. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks. TensorFlow is a symbolic math library based on dataflow and differentiable programming. It is used for both research and production at Google. TensorFlow was developed by the Google Brain team for internal Google use.

#### **Features:**

- The libraries are deployed on a hardware machine, which is a cellular device to the computer with a complex setup.
- TensorFlow has better computational graph visualizations. Which are inherent when compared to other libraries like Torch and Theano.
- TensorFlow is designed to use various backend software (GPUs, ASIC), etc. and also, highly parallel.



**Chapter No.2**

**LITERATURE SURVEY**

## **2.1 Historical Study**

Historically, the challenge of students grappling with career choices due to a lack of guidance has been a persistent issue. In earlier decades, limited access to information and resources made it challenging for students to explore diverse career options in Engineering Fields. The absence of dedicated career guidance systems often resulted in individuals choosing paths based on Skills, Interest, or limited exposure to available opportunities.

Over time, as educational systems evolved, there was a growing recognition of the need for structured career guidance. In the mid-20th century, career counseling began to emerge as a formalized field, aiming to assist individuals in making informed decisions about their professional journeys. However, these early efforts were often constrained by the availability of career counselors and the breadth of information accessible to students.

As technology advanced, the late 20th century witnessed the integration of computer-based tools in career guidance. This marked a significant shift, enabling students to access information about various careers and educational paths digitally in various Engineering Field. Despite these advancements, the tools were often generic and lacked the personalization needed to address individual preferences and aptitudes.

In recent years, with the rise of Artificial Intelligence (AI) and Machine Learning (ML), there has been a transformative shift in career guidance systems. The EduPath initiative represents a contemporary solution leveraging these technologies. It builds upon the historical evolution of career guidance by offering personalized recommendations based not only on academic scores but also on individual personality traits, preferences, and skills.

The historical study underscores the journey from a lack of guidance in the past to the current era where technology plays a pivotal role in shaping career choices. EduPath, with its personalized approach and advanced machine Learning algorithms, represents a culmination of historical challenges addressed through technological innovation. As we move forward, this historical perspective highlights the continued

importance of adapting career guidance to the evolving needs of students in an ever-changing professional landscape.

In addition, the development of this career guidance system has also led to increased awareness for choosing a right career path in Engineering Field. This Career Guidance System has helped to promote Engineering Field, which were previously marginalized and underrepresented.

## **2.2 RELATED WORK**

1. The Report [1] Published by M. Qamhieh, H. Sammaneh and M. N. Demaidi, choosing a university specialization is a challenging decision for high-school students. Due to the lack of guidance and limited online resources, students base their decisions on subjective perceptions of family and friends. This increases the risk of high university dropout rates, and students changing their university disciplines. To address the aforementioned drawbacks, this research paper presents a Personalized Career-path Recommender System (PCRS) to provide guidance and help high school students choose engineering discipline. The design of PCRS is based on fuzzy intelligence of N-layered architecture and uses students' academic performance, personality type, and extra-curricular skills. The association between personality type and engineering discipline was built using a sample of 1250 engineering students enrolled in seven engineering disciplines at An-Najah National University. PCRS is implemented as a mobile application, and it is tested against an evaluation sample of 177 engineers. The sample consists of graduate or undergraduate engineers who are satisfied with their engineering disciplines. The evaluation examined the agreement between the recommendations generated by PCRS and the 177 actual engineering discipline of the sample. The evaluation results proved a slight agreement between the suggested recommendations of PCRS and the actual discipline of the research sample. Hence, PCRS can provide guidance to high-school students who are interested in pursuing their studies in Engineering. The PCRS application is the first career-path recommender to target Palestinian community and other developing countries in the MENA region. The design of PCRS is scalable and it can be expanded in the future to consider other academic majors of higher education.

2. The Report [2] Published by Perry Xiao they introduced This chapter introduces Java programming for mobile applications. It also introduces the mobile software development tool Android Studio, and then provides three mobile example programs, and finally presents the deployment of mobile application programs. The chapter presents Massachusetts Institute of Technology (MIT) App Inventor, another popular way of developing Android applications. It describes the next-generation mobile network technology, 5G, and outlines how 5G works and what it can be used for. The chapter shows how to use Android Studio to develop mobile phone applications— apps—for Android phones. 5G's small cells have a size of a few hundred meters, compared with several kilometers of 4G/3G/2G cells. The Multiple-Input, Multiple-Output describes wireless systems that use two or more transmitters and receivers to send and receive more data at once. Beamforming is designed for base stations to identify the most efficient data-delivery route to a particular user and to reduce interference for nearby users in the process.
3. The Report [3] Published by V. D. Kamath, A. Meher, V. Vidhya and S. Deepthi they introduced that V. D. Kamath, A. Meher, V. Vidhya and S. Deepthi, "An Android based Mobile Application for Career Guidance," 2018 Second International Conference on Inventive Communication and Computational Technologies (ICICCT), Coimbatore, India, 2018, pp. 854-860, doi: 10.1109/ICICCT.2018.8473128. Abstract: The application can be used by students and parents as it provides complete details of colleges like tuition and accommodation fees, eligibility criteria, campus placement opportunities, accommodation facilities, scholarship schemes, campus support services, rules and regulations etc. It helps students to select colleges in engineering and management field in India and abroad based on the factors like qualifying exam details, technical expertise, and other details. The application prepares the college list as per the entrance examination marks and the eligibility criteria of colleges and the courses chosen. The college list is filtered based on parameters like institution ranking, fee limits and location chosen. The registration to the selected college involves student extensive details of students and Aptitude Test (AT). The Aptitude Test is multiple choice question (MCQ) based and includes verbal section, quantitative section, and general knowledge. The application will help the

students to get the most appropriate college and the course in the field of their interest in India or abroad.

4. The Report [4] Published by J. Liu and J. Yu they introduced that the Android platform and the features of Android applications, gave a detailed description of Android application framework from the prospective of developers. A simple music player is provided as an instance to illustrate the basic working processes of Android application components. This paper could provide guidance to understanding the operation mechanism of Android applications and to developing applications on Android platform.

**Chapter No.3**

**METHODOLOGY/ PROPOSED  
SOLUTION**

### **3.1 PROPOSED SOLUTION**

The aim of our project is that should be able to predict the future for selecting the right field in engineering based on their skills, interest, and personality assessment by using Machine Learning. Our application is a simple Deep Learning Sequential Neural Network base software. Our EduPath system provides personalized guidance. Through a user-friendly interface, students gain insights into diverse Engineering fields, eliminating the need for extensive research. Our guidance system, backed by personality-based assessments and machine learning, offers holistic recommendations based on interests and skills, not just academic scores. Students can consult counselors for further clarity, creating a supportive ecosystem. EduPath predictive modeling suggests suitable career options, competitive exams, and recommended colleges, ensuring a well-informed choice, promising a satisfying, and fulfilling educational journey.

#### **3.1.1 Modules:**

##### **Module 1: Dataset Gathering and Pre-Processing:**

We have generated our own dataset for the training model. The dataset consists of more than 100 personality assessments, skills and interest-based questions.

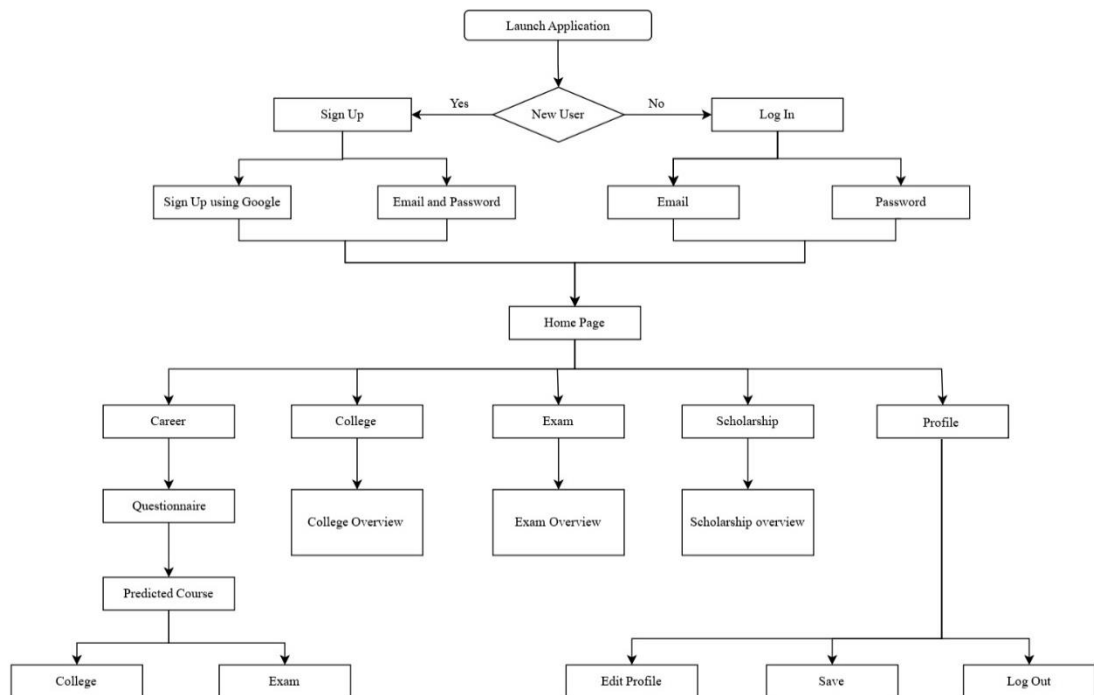
##### **Module 2: Training the Model:**

In this Module we trained the model by providing the dataset and by using TensorFlow model.

##### **Model 3: Predicting:**

Here we implemented the trained model to predict the future in the right career in Engineering field. Also provide a information about the Competitive Exam and provide short information about the Engineering colleges.

### 3.2 SYSTEM ARCHITECTURE



**Figure 3.2: System Architecture**

The primary focus of your project is to provide a good way for predicting a right career path in the Engineering field between the user and application. We have accomplished by training a model for predicting right field in engineering, here user can enter in application in career option and solve personality assessment test and then Machine Learning model predicting a right career path. The system architecture above describes the complete working of the project from training the model to the process of predicting the result and displaying it.



### **3.3 ALGORITHM**

We are using Deep Learning Sequential Neural Network which help for predicting right path in career.

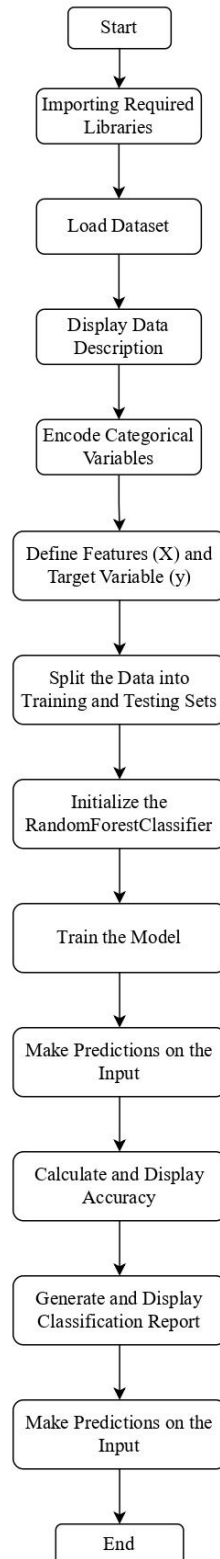
#### **3.3.1 Deep Learning Sequential Neural Network**

A Deep Learning Sequential Neural Network is a type of artificial neural network designed for sequential data processing, making it well-suited for applications like time-series prediction and natural language processing. In the context of a prediction model, it excels at capturing intricate patterns and dependencies within sequential data, allowing it to make nuanced predictions. The "sequential" aspect refers to its ability to analyze data in a specific order, considering the temporal or sequential relationships present. This neural network architecture is often used in predictive modeling scenarios where the input data's order and context play a crucial role, enhancing the accuracy and effectiveness of predictions in dynamic and evolving datasets.

### 3.4 FLOWCHART OF THE PROPOSED SYSTEM

Below is the flowchart of our system which shows how the system is going to work.

The algorithm of the flowchart is further explained below.



**Figure 3.4: Flowchart of the System**

### **Working flow of the application**

1. User/Student Registration
2. Home page interface with options like career, scholarship, college, exam
3. In Career Option, take a personality assessment test which is based on skills, interest and then predictor model predict right career option based on test. After that, applications suggest Competitive Exams and Colleges based on their career path.
4. In Scholarship option, shows various opportunities regarding scholarship in engineering field.
5. In the Competitive Exam option, there are various exams which is based on the Engineering.
6. In Profile Page, show personal information about user/student name, email id, contact number, city, state, language, age, etc.

**Chapter No.4**

**TOOLS /PLATFORM**

## 4.1 ANDROID STUDIO

The popular Integrated Development Environment (IDE) for creating android apps is Android Studio. Android Studio is an open-source integrated development environment (IDE) used to develop Android applications. It was developed by Google and is available for free download on Windows, Mac, and Linux operating systems. Android Studio provides a range of features and tools that simplify the process of developing, testing, and debugging Android applications. It offers a graphical user interface (GUI) designer for building UI layouts and a code editor for writing code in languages such as Java and Kotlin. Additionally, Android Studio includes a code analyzer that detects potential errors and provides suggestions for improvement.

Android Studio also includes support for the latest Android SDKs, allowing developers to take advantage of the latest features and APIs available on the Android platform. It also integrates with popular version control systems like Git, making it easy for developers to manage their code and collaborate with other team members. Overall, Android Studio is a powerful tool for Android app development that can help developers streamline their workflow and build high-quality applications for the Android platform.

One of the key features of Android Studio is its ability to provide an Android emulator, which allows developers to test their applications on different devices without the need for physical devices. It also includes a range of tools for testing, debugging, and profiling applications, as well as for building and deploying apps to the Google Play Store. Furthermore, Android Studio is regularly updated to support the latest Android SDKs and features, providing developers with access to new tools and libraries that can enhance the functionality and user experience of their apps. Overall, Android Studio is a comprehensive IDE that provides a complete development environment for building Android applications. It is widely used by Android developers due to its ease of use, range of features, and seamless integration with the Android ecosystem.

## **4.2 BACKEND TOOLS**

### **4.2.1 JAVA**

Java stands as a versatile, general-purpose programming language initially crafted by Sun Microsystems, now under Oracle's wing, during the mid-1990s. This class-based, object-oriented language prioritizes portability and platform independence. Code written in Java is designed to seamlessly run on any platform with a Java Virtual Machine (JVM) installed. Noted for its simplicity, readability, and user-friendly nature, Java exhibits a syntax akin to C and C++, albeit with distinctions enhancing ease of learning and utilization. Automatic memory management and integrated exception handling contribute to its accessibility.

A standout characteristic of Java is its "write once, run anywhere" philosophy. Java code can be compiled into bytecode, facilitating execution on diverse platforms with a JVM, eliminating the need for recompilation. This feature makes Java a preferred choice for cross-platform applications, spanning desktop, web, and mobile domains. Java's security prowess is evident through its sandbox environment, allowing the execution of untrusted code without jeopardizing system integrity. Built-in support for encryption and authentication further solidifies Java's standing in secure application development. The language boasts an extensive standard library, encompassing diverse classes and methods for routine programming tasks like file handling, networking, and GUI creation. The Java ecosystem is enriched by a plethora of third-party libraries and frameworks, extending its functionality, and simplifying common operations.

Overall, Java remains a sought-after, adaptable language suitable for a spectrum of applications from desktop and web to mobile and embedded systems. Its widespread adoption is attributed to attributes like simplicity, portability, and robust security, rendering it a top choice for developers and organizations globally.

**Features:**

- Platform Independence
- Object-oriented programming
- Security
- Multithreading
- Exception Handling
- High Performance
- Memory Management

**4.2.2 Python 3.0**

Python serves as a versatile, general-purpose programming language crafted for readability and ease of use. Unlike languages that require compilation before execution, Python is interpreted, allowing developers to swiftly write and test code directly with the interpreter. While this agility can impact performance compared to compiled languages, Python's interactive nature enables developers to input code directly into the interpreter, facilitating experimentation and idea testing.

Embracing an object-oriented approach, Python leverages objects to represent data and behavior, fostering organized, modular, and reusable code. It operates as a high-level language, abstracting away low-level complexities like memory management, enhancing code readability and maintenance. Python, under the GNU General Public License (GPL), allows free modification and distribution of its source code. Dynamically typed, Python permits variables to hold values of any type, with the type determined at runtime. Although this flexibility allows for expressive code, it necessitates careful usage to avoid errors. Python's garbage collection automates memory management, relieving developers from manual allocation concerns.

Supporting various programming paradigms, including procedural, object-oriented, and functional programming, Python emerges as a versatile language suitable for a myriad of tasks. Often dubbed a "battery included" language, Python boasts a comprehensive standard library, featuring modules for diverse tasks such as working with

regular expressions and accessing network resources. This inclusive library furnishes developers with pre-built tools, saving time and effort in their projects.

**Features:**

- Easy to learn.
- Easy to code
- Free and Open Source
- Object-Oriented Language
- High-Level Language
- GUI Programming Support
- Platform Independent

### **4.2.3 FIREBASE**

Firebase is a comprehensive mobile and web application development platform provided by Google. It simplifies the development process by offering a suite of tools and services, allowing developers to focus on creating engaging user experiences rather than managing infrastructure. At its core, Firebase provides real-time database services, enabling developers to store and sync data in real time across multiple clients. This makes it ideal for applications requiring collaborative features, such as chat apps or collaborative document editing.

Firebase Authentication is another key feature, allowing developers to easily implement secure user authentication with various providers like email, Google, or Facebook. This ensures that only authorized users can access specific features or data. Hosting on Firebase allows developers to deploy and host web applications effortlessly. The platform provides fast and secure hosting, ensuring a seamless experience for users. Firebase Cloud Functions enable the execution of serverless functions in response to events triggered by changes in data, authentication status, or other Firebase features. This serverless architecture simplifies scaling and maintenance. Firebase also includes a powerful and easy-to-use analytics tool, providing insights into user behavior, engagement, and app performance. This data-driven approach aids developers in making informed decisions to enhance their applications.



## **4.3 FRONTEND TOOLS**

### **4.3.1 Extensible Markup Language (XML)**

In Android Studio, XML (Extensible Markup Language) plays a crucial role in defining various elements like user interfaces, layout designs, menus, and more. Specifically tailored for Android development, Android XML is a specialized version of XML. It comes with unique elements and attributes designed for creating Android-specific user interface components and behaviors. This makes it easier for developers to describe how different parts of an Android app should look and behave using a structured and readable format. So, in simple terms, XML in Android Studio helps developers define the visual and interactive aspects of their apps in a way that's specific and effective for the Android platform.

Here are some common ways in which XML is used in Android Studio:

- **Layouts:** XML is used to define the layout of user interfaces in Android Studio. The layout file defines the structure and appearance of user interface components such as buttons, text fields, and images.
- **Menus:** XML is used to define menus and menu items in Android applications.
- **Styles and themes:** XML is used to define styles and themes that can be applied to user interface components throughout the application.
- **Animations:** XML can be used to define animations and transitions in Android applications.
- **Resources:** XML is used to define various resources such as strings, colors, and dimensions that are used throughout the application.

## **4.4 LIBRARIES USED**

### **4.4.1 TensorFlow**

TensorFlow is like a special toolbox created by the smart folks at Google. It's not just any toolbox; it's made for easily putting machine learning and deep learning ideas into action. Think of it as a helper for doing complicated math and optimizing things quickly. TensorFlow is well-explained and comes with lots of tools for machine learning. It knows how to handle different math problems and has methods to make it easy. People sometimes call it a "Google" thing because it's made by them. This toolbox is packed with useful tools for training and using deep neural networks, like recognizing handwritten digits, understanding images, figuring out words, and creating all sorts of smart models.

### **4.4.3 TensorFlow lite**

TensorFlow Lite is a library developed by Google that extends the capabilities of TensorFlow, a popular open-source machine learning framework. TensorFlow Lite is specifically designed for mobile and edge devices, providing a lightweight and efficient solution for deploying machine learning models on devices with limited computational resources. TensorFlow Lite enables on-device machine learning, allowing applications to run inference tasks directly on smartphones, tablets, IoT devices, and other embedded systems. This eliminates the need for constant internet connectivity and reliance on cloud-based servers, contributing to faster inference times and improved privacy.

### **4.4.3 JUnit**

JUnit is a popular testing library in the Java programming language. It's designed to help developers write and run tests for their Java code in a systematic and efficient manner. The primary goal of JUnit is to ensure that each piece of code, typically a method or function, behaves as expected.

#### **4.4.4 Firebase-Auth**

Firebase Authentication is a library that provides a straightforward and secure way for developers to implement user authentication in their applications. Developed by Firebase, it simplifies the process of managing user identities, allowing app creators to focus on building engaging features rather than dealing with complex authentication systems.

#### **4.4.5 scikit-learn**

Scikit-learn is a user-friendly and versatile machine learning library for Python that provides tools for various tasks related to data analysis and machine learning. Developed on the foundation of other popular scientific computing libraries like NumPy, SciPy, and Matplotlib, scikit-learn is designed to be accessible to both beginners and experienced developers. Scikit-learn acts as a toolbox that contains a wide array of tools and algorithms for machine learning, making it easier for developers to implement and experiment with different techniques.

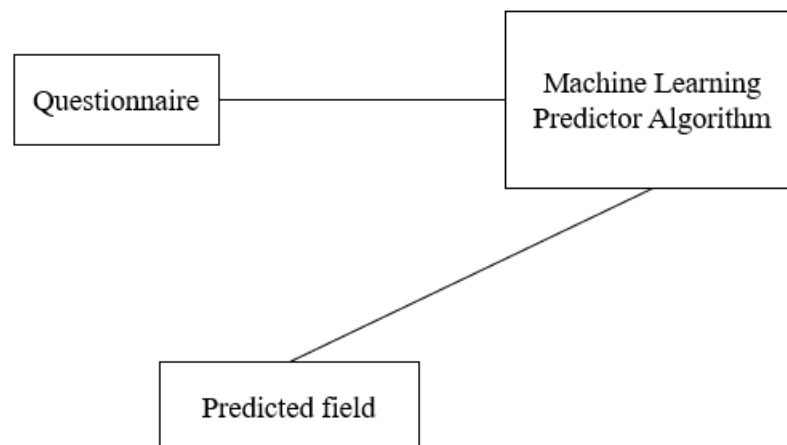
#### **4.4.6 Pandas**

Pandas is a Python library that serves as a powerful tool for data manipulation and analysis. It is widely used by data scientists, analysts, and developers for handling and exploring structured data in a flexible and intuitive manner.

## **Chapter No.5**

# **DESIGN AND IMPLEMENTATION**

## 5.1 SYSTEM DESIGN AND MANAGEMENT

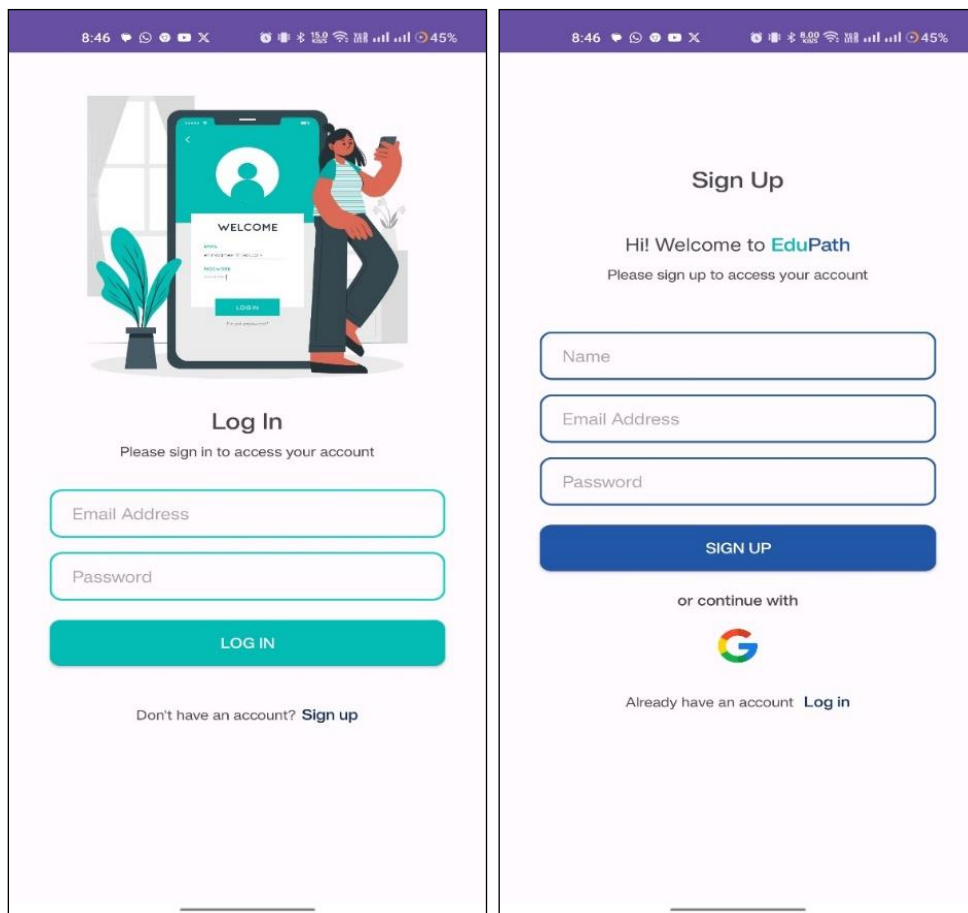


### 5.1 System Design and Management

In above diagram, working of whole program is represented. The App class in main class from where all other classes can be accessed and itself is responsible for predicting a future in right stream in Engineering field. The Creer Guidance System shows window to the user so that the user can select a various option like career, scholarship, exam, colleges. Then the system works on the input based on personality, interest and skills.

## 5.2 USER INTERFACE DESIGN

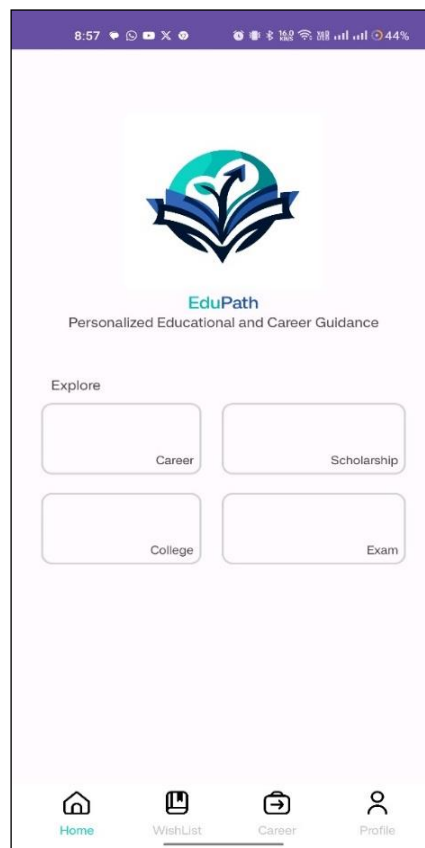
### 5.2.1 Registration Page/Login Page



**Figure 5.2.1 Registration Page/Login Page**

In the above Figure we can see the registration page where user/student are can register themselves and if the user has already registered to the app, he or she can login into the device. We have tried to make a simple design which can be understood by the end user. We must simply enter the Email address and a suitable password or user can directly signup by using google account, we are already to explore the application.

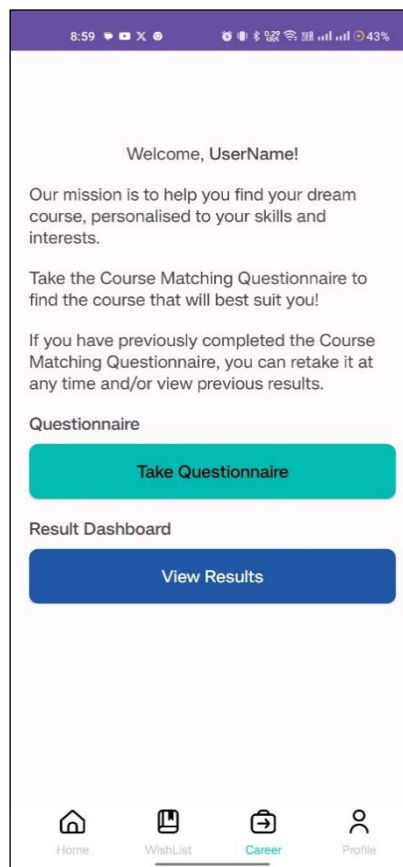
### 5.2.2 Home Page



**Figure 5.2.2 Home Page**

The Home page consists of various options like career, scholarship, college, and exam. In Career option user/student take an advantage of personality assessment and then machine learning model predict a career option in engineering field based on their assessment test. In scholarship, college and exam options that is provide a basic information about various competitive exam, various engineering colleges and various scholarship schemes in engineering fields and bottom navigation button that consisting various options for directly changing pages.

### 5.2.3 Assessment Test Page



**Fig 5.2.3 Assessment Test Page**

The Assessment test page provides a test in take questionnaire option user can give a personality that a check interest in engineering fields.

The features of this application are as follows:

#### **1. Personalized Career Recommendations:**

EduPath employs a sophisticated guidance system that considers individual factors like personality, subject preferences, intelligence, and skills. The application provides personalized career recommendations tailored to each student, going beyond academic scores to ensure a comprehensive and accurate suggestion.

#### **2. Wide Variety of Engineering Fields:**

EduPath offers an extensive database with tools and data covering a diverse range of engineering fields. Students interested in various branches of engineering can



explore options without the need for extensive research, relying on the software to present a comprehensive array of choices.

### **3. Personality-Based Assessment:**

The guidance system initiates its process with personality-based questions, providing insights into a student's preferences and inclinations.

### **4. Machine Learning Algorithm for Future Prediction:**

EduPath utilizes a Machine Learning Algorithm Model to predict future career options based on conducted tests. This predictive modeling aids students in understanding potential career paths, guiding them toward suitable choices in the engineering field.

## **5.3 IMPLEMENTED MODULES**

### **5.3.1 Train a Learning Model**

The Machine Learning Model will be trained on the suitable prediction provided.

### **5.3.2 Engineering Field Prediction**

The Engineering field is predicted based on their interest, skills and personality.

## **Chapter No.6**

# **DATA ANALYSIS, RESULTS AND DISCUSSION**

## **6.1 TESTING**

### **6.1.1 Manual Testing**

Manual testing is when a person, known as a tester, checks a software application without using any automated tools or scripts. Instead, they act like an end-user, testing the software to find any unexpected issues or bugs. Manual testing involves different stages, including unit testing, integration testing, system testing, and user acceptance testing. Testers follow test plans, test cases, or scenarios to ensure thorough testing of the software. Additionally, manual testing includes exploratory testing, where testers explore the software to discover errors in a more intuitive manner. The aim is to make sure that the testing process is comprehensive and effective.

Following are the testing techniques that are performed manually during the test life cycle:

- Unit Testing
- Integration Testing
- System Testing
- Acceptance Testing
- Regression Testing
- Usability Testing
- Security Testing
- Performance Testing

### **6.1.2 Automation Testing**

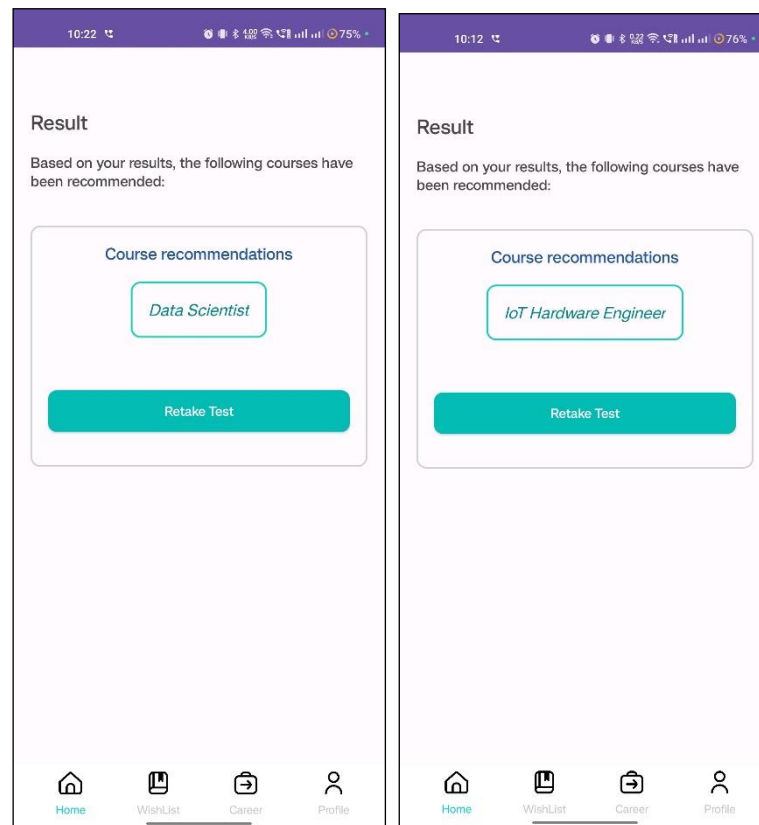
Automation testing, or Test Automation, is a method where testers create scripts and utilize software to test a product. It's a way of automating tasks that were initially done manually. The primary purpose of Automation Testing is to rerun test scenarios that were initially performed manually, doing so rapidly and repeatedly. In addition to regression testing, automation testing is employed to assess the application from perspectives like load, performance, and stress testing. The goal is to execute tests efficiently and consistently through automated processes.

Test Automation should be used by considering the following aspects of a software:

- Large and critical projects.
- Project that requires testing the same areas frequently.

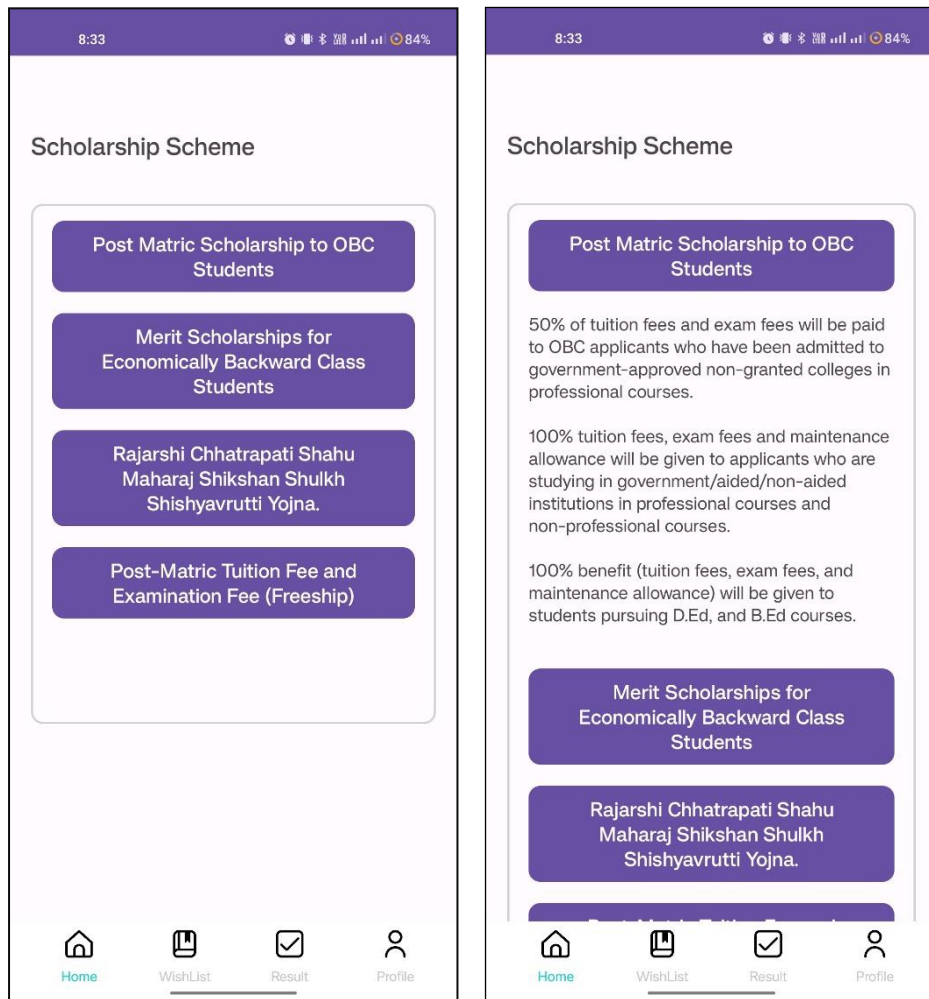
- Requirements not changing frequently.
- Accessing the application for load and performance with many virtual users.
- Stable software with respect to manual testing.
- Availability of time.

## 6.2 RESULT AND DISCUSSION



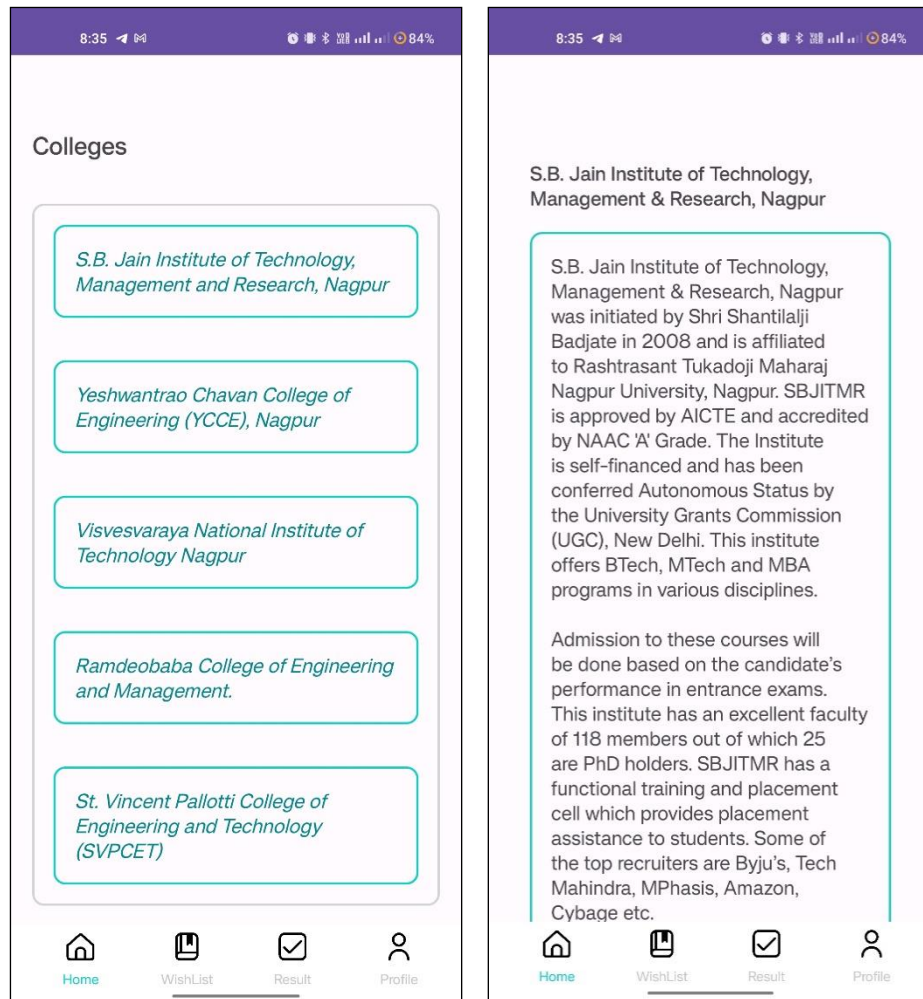
**Figure 6.2.1: Predicted Path**

Figure 6.2.1 shows the predicted career path in the field of engineering by using machine learning predictor model. After the user/student is done with assessment test or solve the questionnaire then machine learning model predicting the right path based on skill, interest and knowledge.



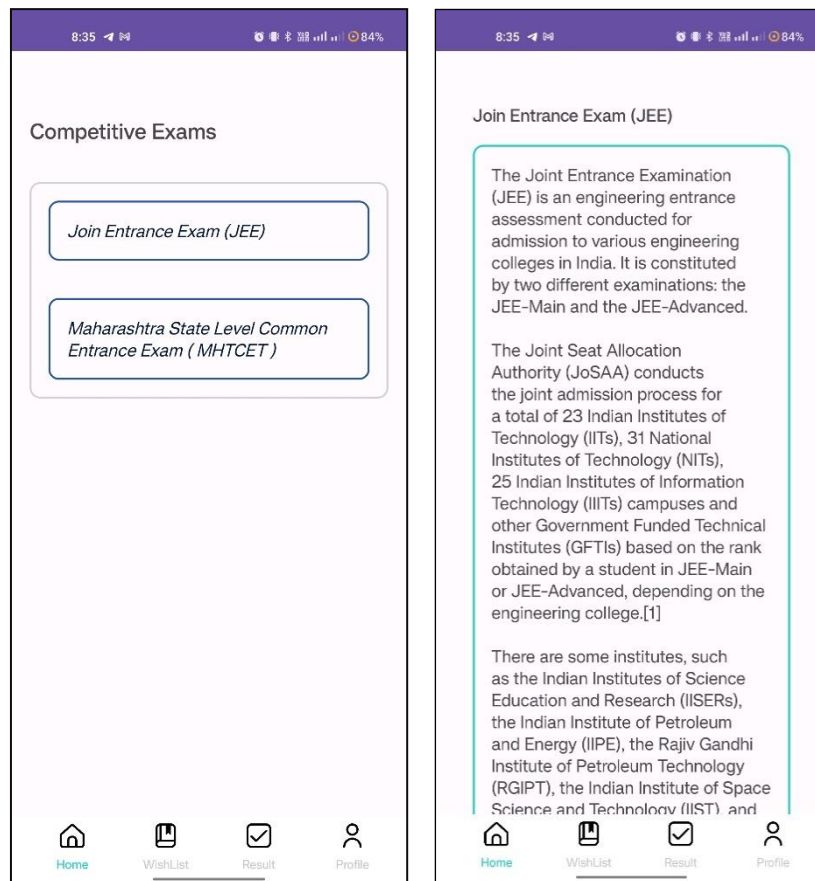
**Figure 6.2.2: Scholarship Scheme**

Fig 6.2.2 shows the various scholarship opportunities or schemes to the user/student that help the student gain knowledge about various scholarship schemes in the field of engineering which depend on cast.



**Figure 6.2.3: Colleges**

Fig 6.2.3 shows the various engineering colleges that help the student for taking a admission in high ranking engineering colleges or provide a small overview about college campus, ranking and various engineering branches.



**Figure 6.2.4 Exams**

Fig 6.2.4 the various competitive exams for taking an admission in engineering field that help the student for taking a admission in high ranking engineering colleges or provide a small overview about competitive exams.

## **Chapter No.7**

# **CONCLUSION AND FUTURE SCOPE**



## 7.1 CONCLUSION

EduPath: Personalized Educational and Career Guidance system stands as a beacon of support for students grappling with the crucial decision of choosing their career paths. The prevalent confusion among students, stemming from a lack of guidance and awareness about diverse opportunities, is effectively addressed by this innovative system. EduPath not only serves as a guiding light for students but also proves to be an asset for career counsellors, opening avenues for their professional growth. The system's personalized approach, integrating factors like personality traits, subject knowledge, intelligence, and critical skills, ensures a holistic recommendation beyond mere academic scores.

The vast array of tools and data made available for students interested in diverse engineering fields sets EduPath apart. By streamlining the decision-making process, it eliminates the need for extensive research, allowing students to make informed choices effortlessly. The initiation of the EduPath journey begins with the system choosing a career for the students. Through a meticulous process involving personality-based questions and comprehensive tests, the embedded guidance system predicts students' preferences and provides tailored recommendations. The incorporation of Machine Learning Algorithms adds a layer of sophistication, enabling accurate predictions for future career options.

The predictive modeling aspect of the system, driven by Machine Learning, not only aids in career selection but also offers insights into competitive exams and suitable engineering colleges. This predictive capability serves as a powerful tool for students navigating the complex landscape of educational and career choices. Looking forward, the future scope of EduPath is vast and promising. Its role in alleviating the confusion and indecision prevalent among students is pivotal.

The personalized and data-driven approach not only benefits individuals but contributes to the overall growth and efficiency of the educational and counselling sectors. In essence, EduPath emerges as a transformative force, guiding students towards fulfilling and satisfying career choices while providing counsellors with a valuable resource. The fusion of technology, data analysis, and personalized guidance positions

EduPath at the forefront of educational and career support systems, poised for continued success and positive impact on the lives of countless students.

## **7.2 FUTURE SCOPE**

The requirement of machine-based career guidance system is very important in present scenario due to lack of knowledge about that field. Even though we have found initial success in this regard, a lot of work needs to be done.

- The main areas where this can be used is in Education sector, Counselling services, Engineering fields, Human Resources, Government sectors.
- Further this can be used to take interest, skill and personality assessment and display the prediction of engineering field for the same which will provide a best career path.

## **APPLICATIONS**

1. The Dataset can easily be extended and customized according to the need of the user and can prove to be an important step toward reducing the lack of guidance in engineering field.
2. The Machine learning model can be used by any person with a basic knowledge of tech and thus available for everyone.
3. This model can be implemented at elementary school level so that kids at a very young age can get to know about a great career path in engineering field.

## REFERENCES

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- [2] Bysshe, S., Hughes, D. & Bowes, L. (2002). The Economic Benefits of Career Guidance: A Review of Current Evidence. Centre for Guidance Studies: University of Derby
- [3] M.Fatih Akay, Ebru Cetin, Imdat Yarim, Ozge Bozkurt, M.Mikail Ozciloglu, "Using Machine Learning Techniques to Earlier Predict Student's Performance", IEEE 2018
- [4] Guide on Life Planning Education and Career Guidance for Secondary Schools (1st Edit.) [C.G.S.S.D.D., Education Bureau -May 2014]
- [5] Shah, H., Rather, M.A., Rafaqi, M.Z.H. & Singh, S.P. (2016). Guidance and Counselling. Srinagar: University of Kashmir.

## APPENDIX A

### Datasheets/Software Details (Code if Any)

#### Loginpage.java

```
package com.example.edupath;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.Toast;

import com.google.firebase.FirebaseApp;

import com.google.firebase.auth.FirebaseAuth;

import com.google.firebase.auth.FirebaseUser;

public class MainActivity extends AppCompatActivity {

    private FirebaseAuth auth;

    EditText emailEditText, passwordEditText;

    Button loginButton;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        // In your Application class or the first activity's onCreate method

        FirebaseApp.initializeApp(this);
```

auth = FirebaseA

### **loginpage.xml**

```
<?xml version="1.0" encoding="utf-8"?>

<ScrollView

    xmlns:android="http://schemas.android.com/apk/res/android"

    xmlns:app="http://schemas.android.com/apk/res-auto"

    xmlns:tools="http://schemas.android.com/tools"

    android:layout_width="match_parent"

    android:layout_height="match_parent"

    tools:context=".MainActivity">

    <androidx.constraintlayout.widget.ConstraintLayout

        android:layout_width="match_parent"

        android:layout_height="wrap_content">

        <LinearLayout

            android:id="@+id/whole_layout"

            android:layout_width="match_parent"

            android:layout_height="wrap_content"

            android:orientation="vertical"

            android:padding="16dp"

            app:layout_constraintBottom_toBottomOf="parent"

            app:layout_constraintEnd_toEndOf="parent"

            app:layout_constraintStart_toStartOf="parent"

            app:layout_constraintTop_toTopOf="parent">

            <ImageView
```

```

        android:id="@+id/login_page"

        android:layout_width="wrap_content"

        android:layout_height="350dp"

        app:srcCompat="@drawable/login_page" />
<TextView

        android:id="@+id/textView1"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_gravity="center"

        android:text="Log In"

        android:textSize="25sp"

        android:textStyle="bold" />
<TextView

        android:id="@+id/textView2"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_gravity="center"

        android:layout_marginTop="8dp"

        android:text="Please sign in to access your account"

        android:textSize="15sp" />
<EditText

        android:id="@+id/email"

        android:layout_width="match_parent"

        android:layout_height="50dp"

```

```

        android:layout_marginHorizontal="20dp"

        android:layout_marginTop="30dp"

        android:background="@drawable/textbox"

        android:hint="Email Address"

        android:inputType="textPersonName"

        android:paddingHorizontal="20dp" />
<EditText

        android:id="@+id/password"

        android:layout_width="match_parent"

        android:layout_height="50dp"

        android:layout_marginHorizontal="20dp"

        android:layout_marginTop="15dp"

        android:background="@drawable/textbox"

        android:hint="Password"

        android:inputType="textPassword"

        android:paddingHorizontal="20dp" />
<androidx.appcompat.widget.AppCompatButton

        android:id="@+id/login_btn"

        android:layout_width="match_parent"

        android:layout_height="wrap_content"

        android:layout_marginHorizontal="20dp"

        android:layout_marginTop="20dp"

        android:background="@drawable/custom_login"

        android:shadowColor="@color/black"

```

```

        android:text="Log in"

        android:textColor="@color/white"

        android:textSize="16sp"/>
<LinearLayout

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_gravity="center"

    android:layout_marginTop="40dp"

    android:orientation="horizontal">

    <TextView

        android:id="@+id/textView4"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:text="Don't have an account?"

        android:textSize="15sp" /

    <Space

        android:layout_width="5dp"

        android:layout_height="wrap_content" />

    <TextView

        android:id="@+id/signup"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:clickable="true"

        android:onClick="onSignUpClick"

```



```
        android:text="Sign up"

        android:textColor="@color/c_b2"

        android:textSize="16sp"

        android:textStyle="bold" />

    </LinearLayout>

</LinearLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

</ScrollView>
```