## DIGITAL SOLUTION FOR A GUIDE TO MAKE THE STUDENT CAPABLE OF HOPPING INTO THE CORPORATE WORLD

**A PROJECT REPORT**

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***in partial fulfillment for the award of the degree of***

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**IN**

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**PANIMALAR ENGINEERING COLLEGE, CHENNAI-600123.**

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**AUGUST 2021**

**BONAFIDE CERTIFICATE**

Certified that this project report “**DIGITAL SOLUTION FOR A GUIDE TO MAKE**

## THE STUDENTS CAPABLE OF HOPPING INTO THE CORPORATE WORLD”

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**ABSTRACT**

Colleges are today considered as a stepping stone into the massive corporate world. In addition to top- class education, they have the responsibility of providing quality placements in a well-established company. Now they have realized that there was an urgent need to take up the responsibility to make the student industry ready from day one. Though many colleges and institutions have placement cells, the number of students who get placed is often low due to multiple issues. Even after having been placed, students are unable to cope with the expectations of the corporate world. Collaborative Learning (Digital Platform) is a digital platform which directs the students towards their goal to make them on par with the current industry demands. In this platform students are able to find the path towards their goal. This platform is tracked by a guide who is having his best of the knowledge on the current needs and trends.

## TABLE OF CONTENTS

CHAPTER NO TITLE PAGE NO ABSTRACT iii

[LIST OF TABLES vii](#_TOC_250033)

LIST OF FIGURES viii

LIST OF ABBREVIATIONS ix

1. INTRODUCTION 1
   1. [Overview 1](#_TOC_250032)
   2. [Problem Definition 2](#_TOC_250031)
2. LITERATURE SURVEY 3
3. SYSTEM ANALYSIS 7
   1. [Existing System 7](#_TOC_250030)
   2. [Proposed system 7](#_TOC_250029)
   3. [Requirement Analysis and Specification 8](#_TOC_250028)
      1. Input Requirements 8
      2. Output Requirements 8
   4. [Technology Stack 8](#_TOC_250027)
      1. Definition MERN Stack 8
      2. How does MERN differs from

Other technologies 9

* + 1. [Working of MERN Stack 10](#_TOC_250026)
    2. Benefits Of MERN Stack 13

1. SYSTEM DESIGN 15
   1. [Use Case Diagram 15](#_TOC_250025)
   2. [ER Diagram 16](#_TOC_250024)
   3. [Class Diagram 17](#_TOC_250023)
   4. [Activity Diagram 18](#_TOC_250022)
   5. [Collaboration Diagram 19](#_TOC_250021)
   6. [Component Diagram 20](#_TOC_250020)
   7. [Deployment Diagram 21](#_TOC_250019)
   8. [Package Diagram 22](#_TOC_250018)
2. SYSTEM ARCHITECTURE 23
   1. Architecture Overview 23
   2. [Algorithm 24](#_TOC_250017)
      1. [Clustering 24](#_TOC_250016)
      2. [K-Means Clustering 25](#_TOC_250015)
      3. [Working of K-Means Clustering 26](#_TOC_250014)
      4. Python of implementation of K-

Means Clustering 27

* + - 1. [Data Preprocessing 27](#_TOC_250013)
      2. [Elbow Method 29](#_TOC_250012)
      3. Training the K-means

Algorithm On The Training Dataset 30

* + - 1. Visualizing The Clusters 31

1. SYSTEM IMPLEMENTATION 33
   1. Client-side coding 33
   2. [Server-side coding 52](#_TOC_250011)
2. TESTING AND DEBUGGING 56
   1. [Testing 56](#_TOC_250010)
      1. [Objectives Of Testing 56](#_TOC_250009)
      2. [Black Box Testing 57](#_TOC_250008)
      3. [White Box Testing 58](#_TOC_250007)
      4. [Testing Strategies 58](#_TOC_250006)
         1. [Unit Testing 59](#_TOC_250005)
         2. Integration Testing 60
         3. [Validation Testing 61](#_TOC_250004)
         4. [System Testing 61](#_TOC_250003)
   2. [Debugging 62](#_TOC_250002)
   3. [System Analysis 63](#_TOC_250001)
   4. Test Case & Reports / Performance Analysis 64
3. CONCLUSION 65
   1. Conclusion and Future Enhancements 65

[APPENDICES 66](#_TOC_250000)

A.1 Sample Screens 66

1. REFERENCES 73
2. PUBLICATION 75

# LIST OF TABLES

|  |  |  |
| --- | --- | --- |
| **TABLE NO** | **TITLE** | **PAGE NO** |
| 1 | Difference Between MERN and MEAN | 10 |
| 2 | Test Cases for Login Screen | 64 |

**LIST OF FIGURE**

|  |  |  |
| --- | --- | --- |
| **FIG NO** | **TITLE** | **PAGE NO** |
| 3.4.1 | MERN Stack | 9 |
| 3.4.3 | Architecture of MERN Stack | 11 |
| 4.1 | Use Case Diagram | 15 |
| 4.2 | ER Diagram | 16 |
| 4.3 | Class Diagram | 17 |
| 4.4 | Activity Diagram | 18 |
| 4.5 | Collaboration Diagram | 19 |
| 4.6 | Component Diagram | 20 |
| 4.7 | Deployment Diagram | 21 |
| 4.8 | Package Diagram | 22 |
| 5.1 | System Architecture Diagram | 23 |
| 5.2.3 | K-means Clustering | 26 |
| 5.2.4.1 | Data Preprocessing | 27 |
| 5.2.4.2 | Elbow Method | 30 |
| 5.2.4.4 | Principal Component Analysis | 31 |

**LIST OF ABBREVATION**

|  |  |
| --- | --- |
| TAM  LMS | Technology Acceptance Model  Learning Management System |
| LAMP | Linux + Apache + MySQL + PHP |
| OJ | Online Judge Module |
| HTTP | Hypertext Transfer Protocol |
| XML | Extensible Markup Language |
| URL | Uniform Resource Locator |
| XHRs | Xml Http Request |
| HTML | Hypertext Markup Language |

**CHAPTER-1 INTRODUCTION**

# OVERVIEW

During this current pandemic year, much like many industries, the education sector has gone through advancements due to technological innovations and the necessity. Even though the traditional classroom learning set works, now there is an urgent call for changing the old tradition of doing things manually. Covid-19 created a massive change inour daily life pattern. One of the major sectors affected by this pandemic situation is the education sector. The students are forcibly pushed to a new tradition where they develop themselves in their home. Schools and colleges play a major role in developing a student to get ready to face these current changing trends. The need for the modern world changes rapidly, the student should be given the best of the knowledge which makes them to satisfy the needs and requirements of the trend. Now there is an urgency to make the student industry ready in the early stages itself.

Hereby, college is the best environment where the student can find the best out of them and shape them into the person who suits the current industrial trend. Many students of our country have many different goals, ideas and talents. Even though having talents and ideas, the probability of students getting lost into the dark shadow of the fast- running world is very high. The major reason behind this is students have ideas, but they are unaware of how to develop it. They talents are not exposed because they don’t know where to express them. The most common and best solution for this issue is a guide. The

student must have someone who has the knowledge of how to develop his/her ideas, how to execute his/her talent and how to make the student find his/her strength.

# PROBLEM DEFINITION

In the current massive corporate world, colleges take a major role in a student’s life to make them on par with society. In addition to top-class education, they have the responsibility of providing quality placements in a well- established company. Now they realised that there was an urgent need to take up the responsibility to make the student industry ready from day one. Though many colleges and institutions have placement cells, the number of students that get placed is often low due to a multitude of reasons. Even after having been placed, students are unable to cop up with the expectations of the corporate world. When we look at the reasons behind this problem, many questions arise in our mind.

* + - What do you do when disasters strike, for instance, the COVID-19 virus causing lockdown on a global scale and students cannot come to schools and colleges?
    - How do you help educators provide the best learning experiences while making sure that they are working efficiently?
    - How to make a student exposed to quality and necessary courses?
    - What are modes a guide can use in analysing the qualities of each student?
    - How do you deal with managing student-related information such as grades and scores?

# CHAPTER-2

**LITERATURE SURVEY**

**TITLE:** Web-based Learning Management System Considerations for Higher Education

**AUTHOR:** Chih-Hung Chung,

Laura A. Pasquini, Chang E. Koh

**JOURNAL:** International Journal of Scientific & Engineering Research (2013)

## OBJECTIVE:

The purpose of this study is to present a model which incorporates the concepts and findings from research on LMS application in higher education. The alternative model was modified based on the TAM. This study provides several recommendations including a model of development and design of an LMS for future implementation in higher educational environment

## KEY FEATURES:

Transmitting course content, evaluating students, evaluating course and instructors, creating class discussion and creating computer based instructions. In addition to midterm exam, course information, article reading and specific task.

## OBSERVATION:

This paper is made only for higher education and this is modified based on technology acceptance model (TAM). This paper gives a solution of unlimited distance education with flexible learning timing.

**TITLE:** Learning Management System (LMS) Success: An Investigation Among the University Students

**AUTHOR:** Seyed Mohammadbagher Jafari, Suha Fouad,

Mohaddece Sadat Moaddab, Sharif Omar

**JOURNAL:** IEEE (2015)

## OBJECTIVE:

This study is an attempt to investigate the factors influence the success of LMS. Research model was developed by examining the relationship between students’ outcomes (perceived usefulness) and information quality, system quality, and readiness for online learning through system use and user satisfaction.

## KEY FEATURES:

This project consists few disadvantages:

* This paper consists of data which has been collected in only one university
* So we cannot guarantee that it is applicable other universities.

## OBSERVATION:

In project reduces the time and cost when compared with normal schools and university. There is no limitation to number of student user at particular time. Student can access /view the quiz, study materials, assignments, videos, doubt clarifications and submit homework.

**TITLE:** A survey paper on e-learning based learning management system

**AUTHOR:** Chirag Patel,

Mahesh Gadhavi, Dr. Atul Pate

**JOURNAL:** International Journal of Scientific & Engineering Research (2013)

## OBJECTIVE:

This paper includes study of numerous e-learning based learning management systems(LMS). Each system is classified as per the parameters such as technology, features and platform-tools. Based on these parameters a new unified cloud based system is proposed with all these parameters and other new features.

## KEY FEATURES:

* Automatic assignment evaluation with integration of plagiarism detector and keyword matching
* Web-based virtual workshop management
* Single sign on

## OBSERVATION:

This paper is for rural area people who is suffering to study in their own place. This paper is describing fully about a cloud based learning system

**TITLE:** Online Learning Management System

**AUTHOR:** Zheng Ninghan,

Tian Shuzhen, Chen Yongqiang

**JOURNAL:** IEEE (2015)

## OBJECTIVE:

This paper is about an online teaching management system called Tsinghua University Online Judger (THUOJ). In this article, the author made his design according to the potential users of the system, and proposed a design of the system’s structure on the basis of the frame using Linux + Apache + MySQL + PHP(LAMP).

## KEY FEATURES:

This project consists of 4 processes

* Process a - Profiling preprocessing section
* Process two - Profiling compilation section
* Process three - the operative part of the evaluation function
* Process four - Profiling answer judgment section

## OBSERVATION:

This project is for coding test (example: Hacker Rank). Especially, the author adopted C and PHP to program the online judge module. Finally, there is a simple website demo has been implemented on the basis of OJ module, in order to demonstrate the usage of proposed system and online judge module

# CHAPTER-3 SYSTEM ANALYSIS

# EXISTING SYSTEM

Nowadays, the academic studies taught in schools and college are not enough for a student to build their skills. They try to increase their skills and gain knowledge about the latest thing of day-to-day life. This idea pushes students to hop into the world of online learning platforms. This lead to the creation of a new digital learning environment called Learning Management System, commonly stated as LMS. There are plenty of LMS systems available on our internet, where students learn lots and lots of skills and knowledge from a variety of topics. In these students are given the opportunity of choosing the courses on their own based on their interest. They enroll in the course, take up the study materials such as live sessions, recorded video’s, documents, power point presentations and many other. They are also given with exercises, assignment, test and exams to test themselves.

# PROPOSED SYSTEM

Our model is LMS based platform, which is maintained by the colleges to make the students exposed to the changing needs of the existing corporate world. The course recommended on this digital platform helped the students to develop themselves in such a way to make them on par with current industrial demand. This platform is maintained by a guide who has the best of his knowledge on the industrial requirements, upcoming technologies, trends, etc. The courses in our platform are recommended by filtering the courses available on our internet. This

filtering process is done by the means of past rating and reviews of those who had gone through that particular course. The students are also raising the awareness of what is currently trending courses and skills. This helps the student to be updated.

# REQUIREMENT ANALYSIS AND SPECIFICATION

* + 1. **INPUT REQUIREMENT**

A new user has to create an account by providing their personal details, academic details, college details and skills details. After creating an account, the user will be given a login id and a password. By using this, the user can get into his/her dashboard.

# OUTPUT REQUIREMENT

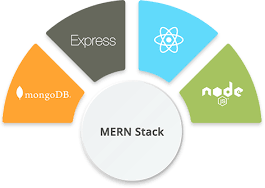
The users are provided with a list of trending courses for their study. They are monitored by a guide who will track them on the right path. Students are also given an opportunity where they can analyze them on their own. The final year students are provided with an extra module where they find their placement details.

# TECHNOLOGY STACK

* + 1. **DEFINITION OF MERN STACK**

MERN Stack is a JavaScript Stack that is used for easier and faster deployment of full-stack web applications. MERN Stack comprises of 4 technologies namely: [MongoDB](https://www.geeksforgeeks.org/mongodb-an-introduction/), [Express](https://www.geeksforgeeks.org/introduction-to-express/), [React](https://www.geeksforgeeks.org/react-js-introduction-working/) and [Node.js.](https://www.geeksforgeeks.org/introduction-to-nodejs/) Each of these 4 powerful technologies provides an end-to-end framework for the developers to

work in and each of these technologies play a big part in the development of web applications.



## Fig 3.4.1: MERN Stack

* + 1. **HOW DOES MERN DIFFERS FROM OTHER TECHNOLOGIES**

It is designed to make the development process smoother and easier. MERN is one of several variations of the [MEAN stack](https://www.mongodb.com/mean-stack) (MongoDB Express Angular Node), where the traditional Angular.js frontend framework is replaced with React.js. Other variants include MEVN (MongoDB, Express, Vue, Node), and really any frontend JavaScript framework can work Express and Node make up the middle (application) tier. Express.js is a server-side web framework, and Node.js the popular and powerful JavaScript server platform. Regardless of which variant you choose, ME(RVA)N is the ideal approach to working with JavaScript and JSON, all the way through.

.

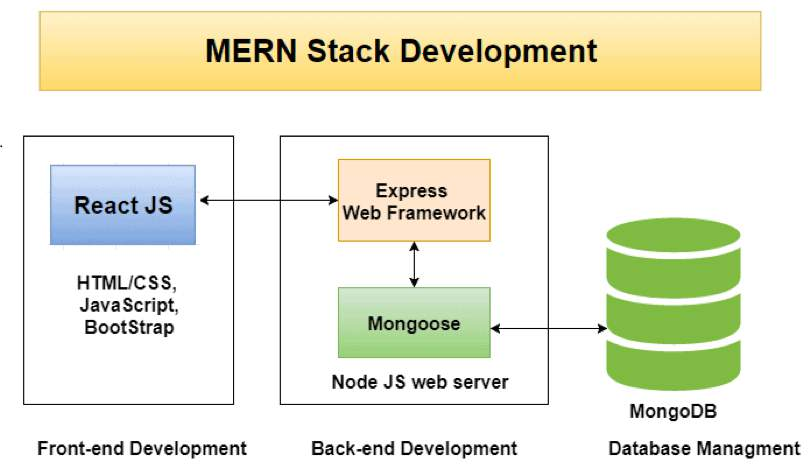
|  |  |  |
| --- | --- | --- |
| **S.NO** | **MEAN STACK** | **MERN STACK** |
| **1** | It’s technology stack comprises of MongoDB, Angular, Express and Node. | It’s technology stack comprises of MongoDB, React, Express and Node. |
| **2** | It uses Typescript language. | It uses JavaScript, JSX |
| **3** | It is a JavaScript framework | It is open source JS library |
| **4** | It offers better productivity. | Its offers low productivity. |
| **5** | Its learning curve is steep. | It offers far better documentation |
| **6** | It helps in managing and rendering the code. | It facilitates smooth rendering. |
| **7** | It does not support mobile application | It supports mobile application. |
| **8** | It’s flow of data is bidirectional | It’s flow of data is unidirectional |

.

## Table 1: Difference Between MEAN and MERN

# WORKING OF MERN STACK

The MERN architecture allows you to easily construct a 3-tier architecture (frontend, backend, database) entirely using JavaScript and JSON.



## Fig 3.4.3: Architecture of MERN Stack

**React.js Front End**

The top tier of the MERN stack is React.js, the declarative JavaScript framework for creating dynamic client-side applications in HTML. React lets you build up complex interfaces through simple Components, connect them to data on your backend server, and render them as HTML. Reacts strong suit is handling stateful, data-driven interfaces with minimal code and minimal pain, and it has all the bells and whistles you’d expect from a modern web framework: great support for forms, error handling, events, lists, and more.

# Express.js and Node.js Server Tier

The next level down is the Express.js server-side framework, running inside a Node.js server. Express.js bills itself as a “fast, un-opinionated, minimalist web framework for Node.js,” and that is indeed exactly what it is. Express.js has powerful models for URL routing (matching an incoming URL with a server function), and handling HTTP requests and responses. By making XML HTTP Requests (XHRs) or GETs or POSTs from your React.js front-end, you can connect to Express.js functions that power your application. Those functions in turn use MongoDB’s Node.js drivers, either via callbacks for using Promises, to access and update data in your MongoDB database.

# MongoDB Database Tier

If your application stores any data (user profiles, content, comments, uploads, events, etc.), then you’re going to want a database that’s just as easy to work with as React, Express, and Node. That’s where MongoDB comes in: JSON documents created in your React.js front end can be sent to the Express.js server, where they can be processed and (assuming they’re valid) stored directly in MongoDB for later retrieval. Again, if you’re building in the cloud, you’ll want to look at Atlas.

# 3.4.3 BENIFITS OF MERN STACK

The growing trend towards [Big Data](https://www.simplilearn.com/how-big-is-big-data-rar335-article) and NoSQL databases like MongoDB has seen a surge in commercial and open-source MongoDB deployments across multiple industries. MongoDB is designed for fast and powerful data analytics and easy scalability. It can deliver the most common Big Data functions, including data modeling, query optimization, query isolation, and scalable storage. MongoDB's strength lies in its being the only NoSQL database that supports SQL-based queries, making it ideal for advanced data analytics and ad hoc data management. Today, MongoDB is deployed either on-premises or as a service. Most organizations are experimenting with this technology to gain better insights into the data through advanced analytics and provide faster user experiences.

The ExpressJS API is a great starting point, especially if you are looking for an easy way to create a very minimal server. ExpressJS has powerful features that allow you to add a backend API dynamically. This capability comes in very handy to add additional functionality to the front end by using a third-party library. ExpressJS is easy to start using. It doesn't come with any frameworks or plugins, and it doesn't need any third-party dependencies. It's very lightweight and can work well as a standalone server.

React provides a robust and opinionated way to build modern apps. It allows you to write components that are extensible, adaptable, and scalable. It's highly declarative, flexible, and most importantly fast. React avoid writing pure function calls and provides a simple, compact way to describe what your app will do. React components are easily testable and compostable, and they usually re-use

a single abstract component tree. React has its way of passing data and state through your components. React also handles state management and resetting for us. That means you can split your UI into multiple components that re-use some parts of the state tree and easily keep details up-to-date.

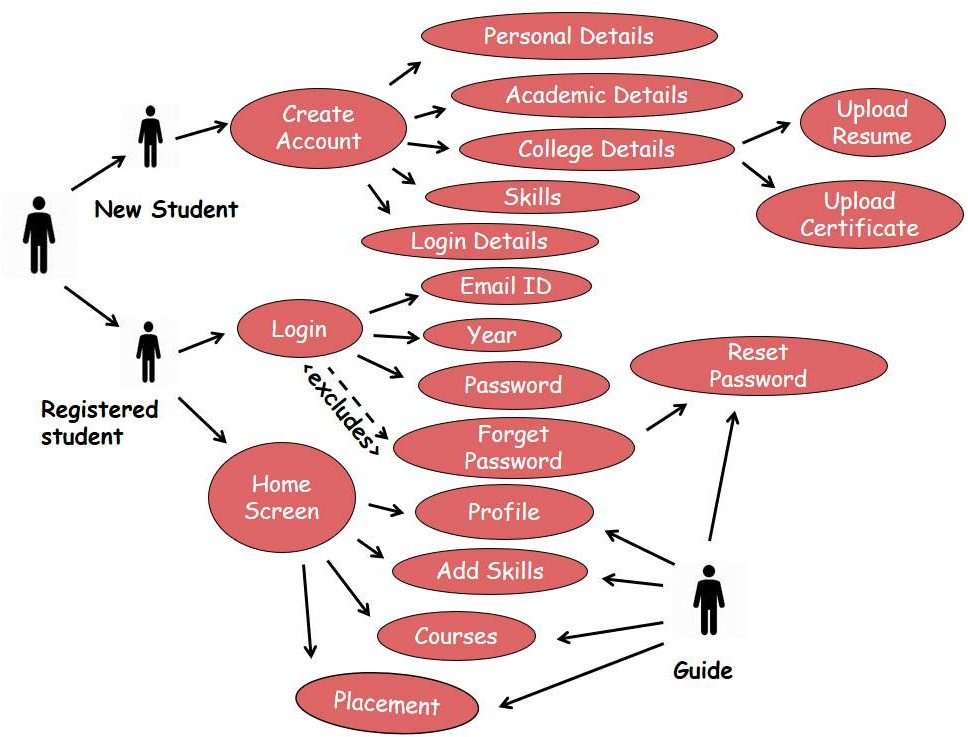
React uses props and state to build the UI. Your state is passed through as props and kept inside your component tree, rather than your having to hold the state in an object tree like a traditional C++ class. This feature is great because it means you can dispatch and modify the state dynamically within a single component. This is an opinionated approach that requires you to leave most of your code alone and declaratively describe how your UI should be laid out.

Main benefits of using NodeJS for developing web applications include, there is a variety of libraries and tooling available, allowing you to build robust applications with only a few code lines. It helping in developing highly interactive applications by leveraging HTTP, database, and other third party software without creating an API first. It's written in the JavaScript language, which is widely used globally and allows you to build cross-platform applications that can be used in the browser, iOS, Android, and other operating systems. It's built on the v8 JavaScript engine, allowing developers to run JavaScript code in the browser without any external libraries' needs. The large existing community of NodeJS developers contribute code to the project, thus speeding up development. Unlike Python or Ruby, NodeJS supports numerous data types, allowing you to write data-heavy applications familiarly and easily.

# CHAPTER-4 SYSTEM DIAGRAM

# USE CASE DIAGRAM

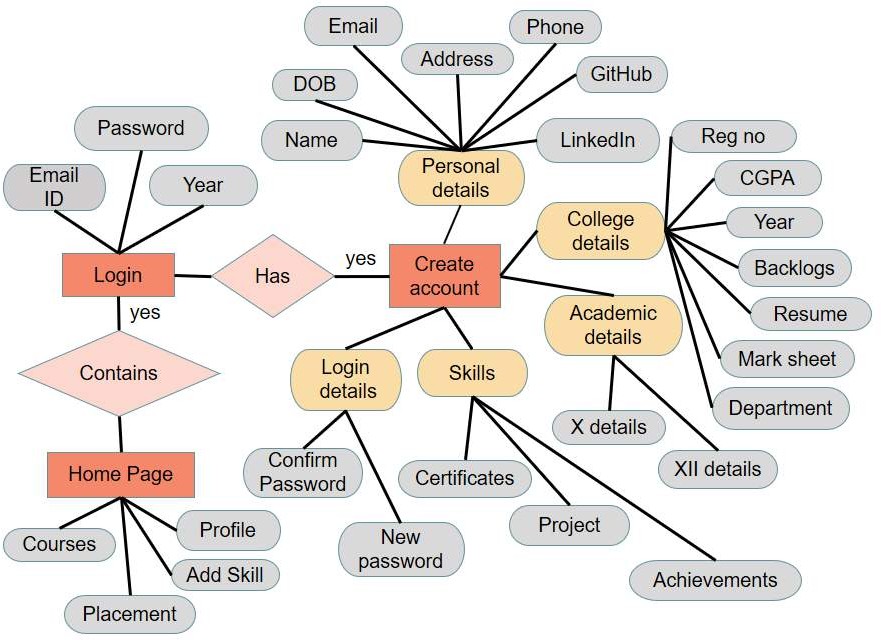
A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different [use cases](https://en.wikipedia.org/wiki/Use_case) in which the user is involved. A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses.



# Fig 4.1: Use Case Diagram

# ER DIAGRAM

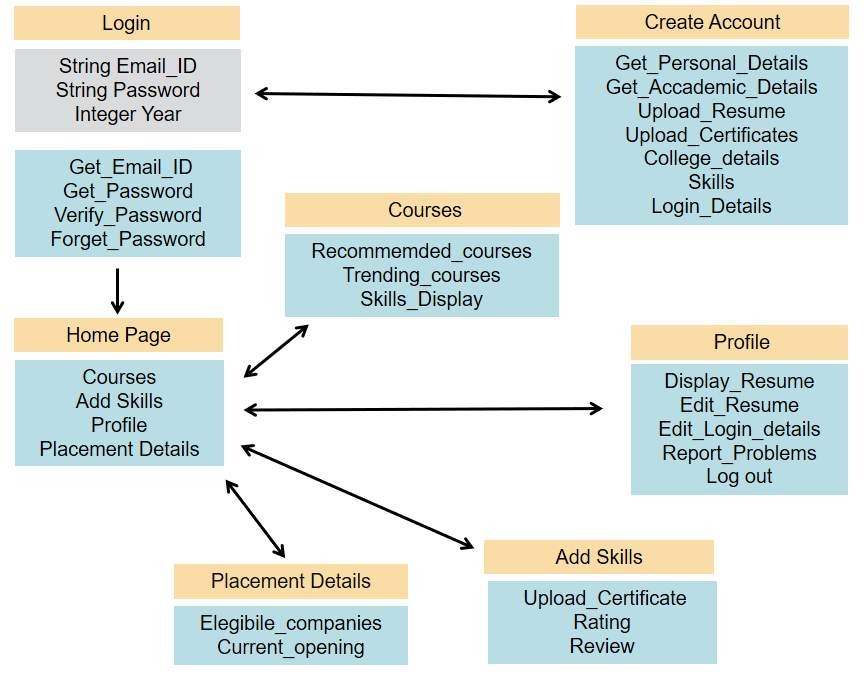
ER Diagram stands for Entity Relationship Diagram, also known as ERD is a diagram that displays the relationship of entity sets stored in a database. In other words, ER diagrams help to explain the logical structure of databases. ER diagrams are created based on three basic concepts: entities, attributes and relationships. ER Diagrams contain different symbols that use rectangles to represent entities, ovals to define attributes and diamond shapes to represent relationships.



# Fig 4.2: ER Diagram

# CLASS DIAGRAM

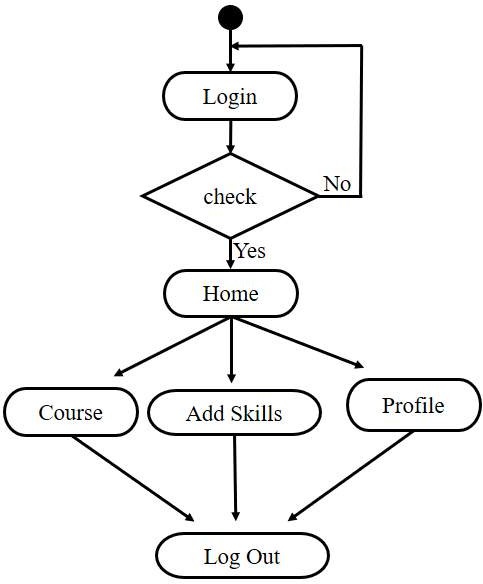
Class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also for constructing executable code of the software application. Class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class diagrams are widely used in the modeling of object oriented systems because they are the only UML diagrams, which can be mapped directly with object-oriented languages. Class diagram shows a collection of classes, interfaces, associations, collaborations, and constraints. It is also known as a structural diagram.



# Fig 4.3: Class Diagram

# ACTIVITY DIAGRAM

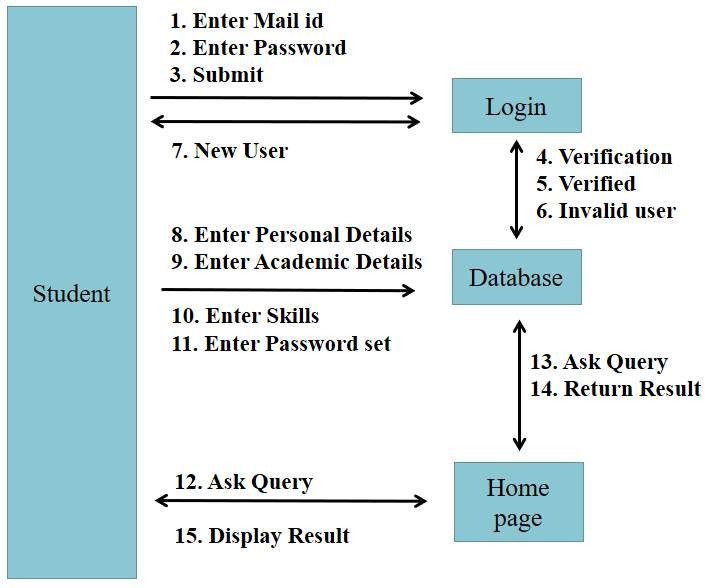
Activity diagrams are graphical representations of [workflows](https://en.wikipedia.org/wiki/Workflow) of stepwise activities and actions with support for choice, iteration and concurrency. In the [Unified Modeling Language](https://en.wikipedia.org/wiki/Unified_Modeling_Language), activity diagrams are intended to model both computational and organizational processes (i.e., workflows), as well as the data flows intersecting with the related activities. Although activity diagrams primarily show the overall flow of control, they can also include elements showing the flow of data between activities through one or more data stores.



# Fig 4.4: Activity Diagram

# COLLABORATION DIAGRAM

The collaboration diagram is used to show the relationship between the objects in a system. Both the sequence and the collaboration diagrams represent the same information but differently. Instead of showing the flow of messages, it depicts the architecture of the object residing in the system as it is based on object-oriented programming. An object consists of several features. Multiple objects present in the system are connected to each other. The collaboration diagram, which is also known as a communication diagram, is used to portray the object's architecture in the system.

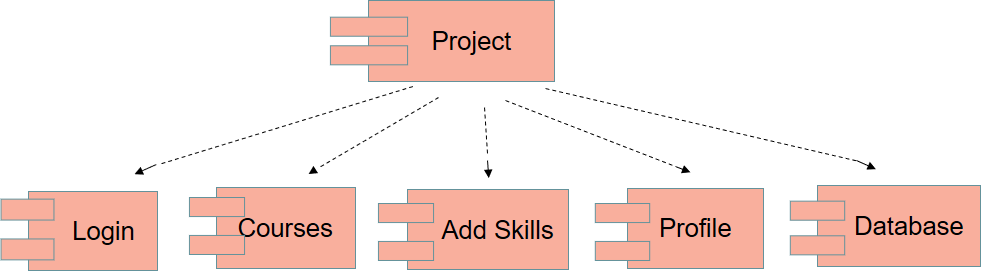


# Fig 4.5: Collaboration Diagram

# COMPONENT DIAGRAM

A component diagram is used to break down a large object-oriented system into the smaller components, so as to make them more manageable. It models the physical view of a system such as executables, files, libraries, etc. that resides within the node. It visualizes the relationships as well as the organization between the components present in the system.

It helps in forming an executable system. A component is a single unit of the system, which is replaceable and executable. The implementation details of a component are hidden, and it necessitates an interface to execute a function. It is like a black box whose behavior is explained by the provided and required interfaces.



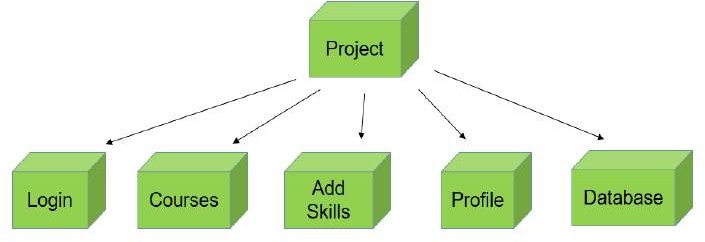
# Fig 4.6: Component Diagram

# DEPLOYMENT DIAGRAM

The deployment diagram visualizes the physical hardware on which the software will be deployed. It portrays the static deployment view of a system. It involves the nodes and their relationships. It ascertains how software is deployed on the hardware. It maps the software architecture created in design to the physical system architecture, where the software will be executed as a node. Since it involves many nodes, the relationship is shown by utilizing communication paths. The deployment diagram does not focus on the logical components of the system, but it put its attention on the hardware topology.

Following are the purposes of deployment diagram enlisted below:

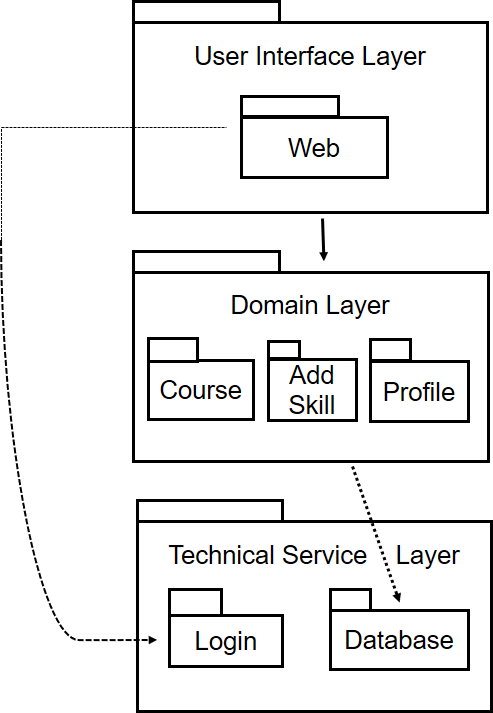
* + 1. To envision the hardware topology of the system.
    2. To represent the hardware components on which the software components are installed.
    3. To describe the processing of nodes at the runtime.



# Fig 4.7: Deployment Diagram

# PACKAGE DIAGRAM

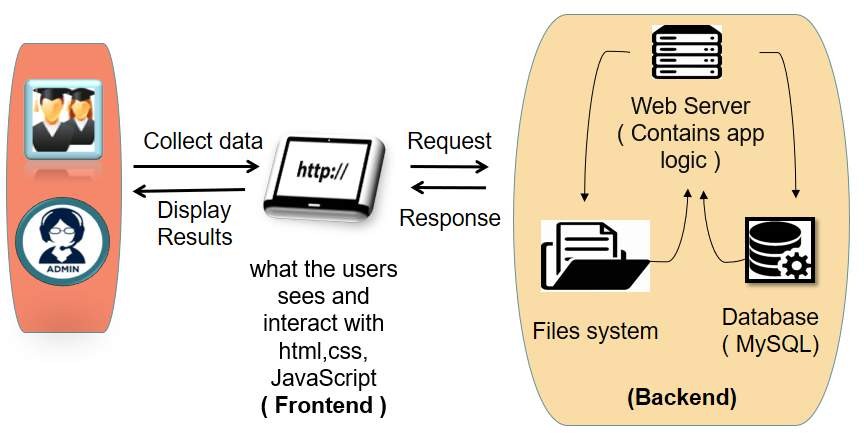
A package is a grouping of model elements which means that a package can contain model elements of different kinds, including other packages to create hierarchies. A package defines a namespace for its contents using for various purposes. Package diagram is used to simplify complex class diagrams, you can group classes into packages. A package is a collection of logically related UML elements.



# Fig 4.8: Package Diagram

**CHAPTER-5 SYSTEM ARCHITERTURE**

* 1. **ARCHITERATURE OVERVIEW**

A system architecture is the [conceptual model](https://en.wikipedia.org/wiki/Conceptual_model) that defines the [structure](https://en.wikipedia.org/wiki/Structure), [behavior](https://en.wikipedia.org/wiki/Behavior), and more [views](https://en.wikipedia.org/wiki/View_model) of a [system](https://en.wikipedia.org/wiki/System). An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the [structures](https://en.wikipedia.org/wiki/Structure) and [behaviors](https://en.wikipedia.org/wiki/Behavior) of the system. A system architecture can consist of system [components](https://en.wikipedia.org/wiki/System) and the sub-systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture, collectively these are called [architecture](https://en.wikipedia.org/wiki/Architecture_description_languages) [description languages](https://en.wikipedia.org/wiki/Architecture_description_languages)

## Fig 5.1: System Architecture Diagram

# ALGORITHM

Algorithms are the patterns and procedures used to accomplish the goal at hand. In this project the students are clustered using a clustering algorithm. They are clustered into groups of specific characteristics. K-means clustering is the algorithm that we use here.

# CLUSTERING

Clustering is one of the most common exploratory data analysis technique used to get an intuition about the structure of the data. It can be defined as the task of identifying subgroups in the data such that data points in the same subgroup (cluster) are very similar while data points in different clusters are very different. In other words, we try to find homogeneous subgroups within the data such that data points in each cluster are as similar as possible according to a similarity measure such as Euclidean-based distance or correlation-based distance. The decision of which similarity measure to use is application-specific. Clustering analysis can be done on the basis of features where we try to find subgroups of samples based on features or on the basis of samples where we try to find subgroups of features based on samples. Clustering is used in market segmentation; where we try to find customers that are similar to each other whether in terms of behaviors or attributes, image segmentation/compression; where we try to group similar regions together, document clustering based on topics, etc. Unlike supervised learning, clustering is considered an unsupervised learning method since we don’t have the ground truth to compare the output of the clustering algorithm to the true labels to evaluate its performance.

# K-Means Clustering

**K-means** algorithm is an iterative algorithm that tries to partition the dataset into *K* pre-defined distinct non-overlapping subgroups (clusters) where each data point belongs to **only one group**. It tries to make the intra-cluster data points as similar as possible while also keeping the clusters as different (far) as possible. It assigns data points to a cluster such that the sum of the squared distance between the data points and the cluster’s centroid (arithmetic mean of all the data points that belong to that cluster) is at the minimum. The less variation we have within clusters; the more homogeneous (similar) the data points are within the same cluster. The way k-means algorithm works is as follows:

* + - 1. Specify number of clusters *K*.
      2. Initialize centroids by first shuffling the dataset and then randomly selecting *K* data points for the centroids without replacement.
      3. Keep iterating until there is no change to the centroids. i.e assignment of data

points to clusters isn’t changing.

Compute the sum of the squared distance between data points and all centroids. Assign each data point to the closest cluster (centroid). Compute the centroids for the clusters by taking the average of the all data points that belong to each cluster

# Working of K-Means Clustering

The working of the K-Means algorithm is explained in the below steps: Step-1: Select the number K to decide the number of clusters.

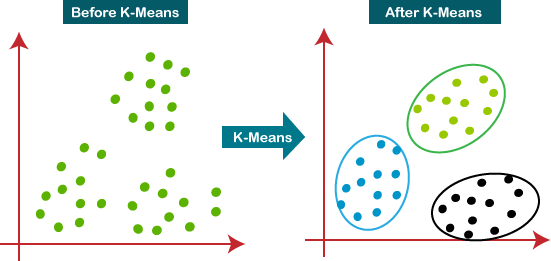
Step-2: Select random K points or centroids. (It can be other from the input dataset).

Step-3: Assign each data point to their closest centroid, which will form the predefined K clusters.

Step-4: Calculate the variance and place a new centroid of each cluster.

Step-5: Repeat the third steps, which means reassign each data point to the new closest centroid of each cluster.

Step-6: If any reassignment occurs, then go to step-4 else go to FINISH. Step-7: The model is ready.



## Fig 5.2.3 K-means Clustering

* + 1. **Python Implementation of K-Means Clustering**

The steps to be followed for the implementation are given below:

* Data Pre-processing
* Finding the optimal number of clusters using the elbow method
* Training the K-means algorithm on the training dataset
* Visualizing the clusters

# Data Preprocessing

Data Preprocessing or Data Preparation is a data mining technique that transforms raw data into an understandable format for ML algorithms. Real- world data usually is noisy (contains errors, outliers, duplicates), incomplete (some values are missed), could be stored in different places and different formats. The task of Data Preprocessing is to handle these issues. In the common ML pipeline, Data Preprocessing stage is between Data Collection stage and Training / Tunning Model.



## Fig 5.2.4.1 Data Preprocessing

**Stages of Data preprocessing for K-means Clustering:**

* + - * 1. Data Cleaning - Removing duplicates, removing irrelevant observations and errors, removing unnecessary columns, handling inconsistent data and handling outliers and noise.
        2. Handling missing data
        3. Data Integration
        4. Data Transformation - Feature Construction, handling skewness and data Scaling.
        5. Data Reduction - Removing dependent (highly correlated) variables, feature selection and PCA.

## Importance of Data Preprocessing stage:

1. Different ML models have different required input data (numerical data, images in specific format). Without the right data, nothing will work.
2. Because of “bad” data, ML models will not give any useful results, or even may

give wrong answers, that may lead to wrong decisions ([GIGO principle](https://en.wikipedia.org/wiki/Garbage_in%2C_garbage_out)).

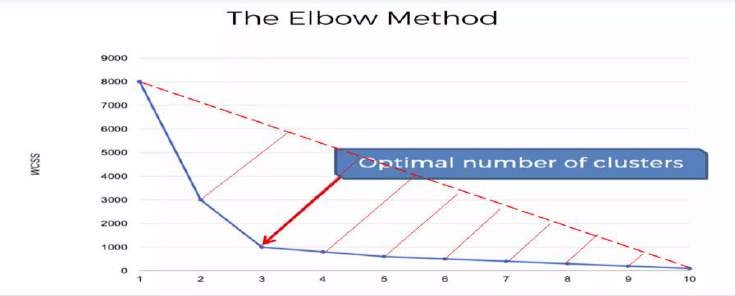
1. The higher the quality of the data, the less data is needed.

# ELBOW METHOD

[K-means](https://en.wikipedia.org/wiki/K-means_clustering) is a simple [unsupervised machine learning](https://en.wikipedia.org/wiki/Unsupervised_learning) algorithm that groups a dataset into a user-specified number (*k*) of clusters. The algorithm is somewhat naive--it clusters the data into *k* clusters, even if *k* is not the right number of clusters to use. Therefore, when using k-means clustering, users need some way to determine whether they are using the right number of clusters. One method to validate the number of clusters is the elbow method*.* The idea of the elbow method is to run k-means clustering on the dataset for a range of values of *k* (say, *k* from 1 to 10 in the examples above), and for each value of *k* calculate the sum of squared errors (SSE).

Then, plot a line chart of the SSE for each value of *k*. If the line chart looks like an arm, then the "elbow" on the arm is the value of *k* that is the best. The idea is that we want a small SSE, but that the SSE tends to decrease toward 0 as we increase *k* (the SSE is 0 when *k* is equal to the number of data points in the dataset, because then each data point is its own cluster, and there is no error between it and the center of its cluster). So our goal is to choose a small value of *k* that still has a low SSE, and the elbow usually represents where we start to have diminishing returns by increasing *k*.

When using K-Means algorithm, unlike algorithms such as DBSCAN, you need to always specify the number of clusters that you need the data set clustered into. So the easiest way of doing this is the use of Elbow method. Most of the time, Elbow method is used with either squared error(sse) or within cluster sum of errors(wcss). In this example, I will be using wcss to find the optimal number of clusters.



## Fig 5.2.4.2 Elbow Method

* + - 1. **TRAINING THE K-MEANS ALGORITHM ON THE TRAINING DATASET**

We have got the number of clusters, so we can now train the model on the dataset. To train the model, we will use the same two lines of code as we have used in the above section, but here instead of using i, we will use 5, as we know there are 5 clusters that need to be formed. The code is given below:

1. kmeans = KMeans(n\_clusters=5, init='k-means++', random\_state= 42)
2. y\_predict= kmeans.fit\_predict(x)

The first line is the same as above for creating the object of K-Means class. In the second line of code, we have created the dependent variable **y\_predict** to train the model. By executing the above lines of code, we will get the y\_predict variable. We can check it under **the variable explorer** option in the Spyder IDE. We can now compare the values of y\_predict with our original dataset.

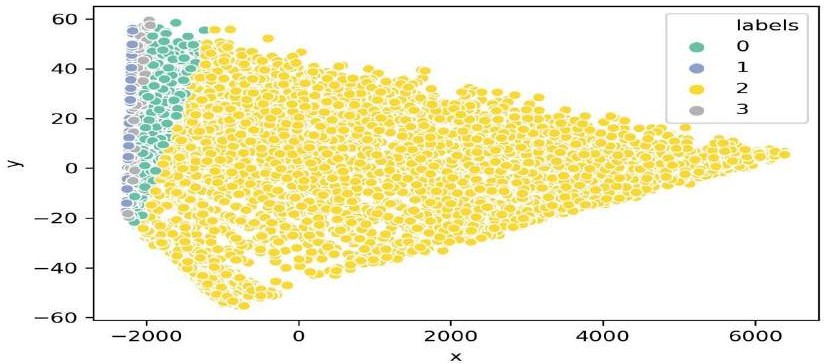
# VIZUALIZING THE CLUSTERS

The k-means algorithm captures the insight that each point in a cluster should be near to the center of that cluster In the above visualization, the

color of the small data points represents the cluster to which they have been assigned. To visualize the clusters, you can use one of the most popular methods for dimensionality reduction, namely PCA and t-SNE.

## Principal Component Analysis (PCA)

PCA works by using orthogonal transformations to convert correlates features into a set of values of linearly uncorrelated features. What is left are features that contain the largest possible variance. Although PCA might have been successful in reducing the dimensionality of the data, it does not seem to visualize the clusters very intuitively



## Fig 5.2.4.4 Principal Component Analysis

. This happens often with high dimensional data, they are typically clustered around the same point and PCA extracts that information. Instead, we can use an algorithm called t-SNE which is specifically made to create an intuitive representation/visualization of the data.

## t-distributed Stochastic Neighbor Embedding (t-SNE)

t-SNE is an algorithm for visualizing high dimensional data. It uses local relationships between points to create a low-dimensional mapping which results in capturing non-linear structures. It starts by creating a probability distribution (i.e., Gaussian) which dictates the relationships between neighboring points. Then, it constructs a low dimensional space that follows that distribution as closely as possible using the Student t-distribution. Now you may wonder why it uses a Student t-distribution at this step. Well, a Gaussian distribution has a short tail which squashes nearby points together. t-SNE gives a much more intuitive visual representation of the data. As can be seen in the animations, both cosine k-Means and DBSCAN seem to create logical clusters.

# CHAPTER-6 SYSTEM IMPLEMRNTATION

* 1. **CLIENT SIDE CODING Index.html:**

<!DOCTYPE html>

<html>

<head>

<meta name="viewport" content="width=device-width, initial-scale=1">

<style>

body {

font-family: Arial, Helvetica, sans-serif; background-image: url('background.jpg'); background-repeat: no-repeat; background-size: cover;

}

/\* Full-width input fields \*/ input[type=text], input[type=password] { width: 100%;

padding: 12px 20px; margin: 8px 0; display: inline-block; border: 1px solid #ccc;

box-sizing: border-box;

}

/\* Set a style for all buttons \*/ button {

background-color: #4CAF50;

\

color: white; padding: 14px 20px; margin: 8px 0; border: none; cursor: pointer; width: 100%;

}

button:hover { opacity: 0.8;

}

/\* Extra styles for the cancel button \*/

.loginbtn{ margin: 0;

position: absolute; top: 75%;

left: 50%;

-ms-transform: translate(-50%,-50%); transform: translate(-50%, -50%); background-color: black;

}

.cancelbtn { width: auto;

padding: 10px 18px; background-color: #f44336;

}

.createact{ margin: 0;

position: absolute; top: 90%;

left: 50%;

-ms-transform: translate(-50%,-50%);

transform: translate(-50%, -50%); background-color:#117A65;

}

.login2{ margin: 0;

position: absolute; top: 100%;

left: 50%;

-ms-transform: translate(-50%,-50%); transform: translate(-50%, -50%); background-color:#117A65;

}

/\* Center the image and position the close button \*/

.imgcontainer { text-align: center;

margin: 24px 0 12px 0; position: relative;

}

img.avatar { width: 40%;

border-radius: 40%; border: 10px solid #555;

}

.container { padding: 16px;

}

span.psw { float: right;

padding-top: 16px;

}

h2{

text-align: center; line-height: 1000px; height: 200px;}

/\* The Modal (background) \*/

.modal {

display: none; /\* Hidden by default \*/ position: fixed; /\* Stay in place \*/

z-index: 1; /\* Sit on top \*/ left: 0;

top: 0;

width: 100%; /\* Full width \*/ height: 100%; /\* Full height \*/

overflow: auto; /\* Enable scroll if needed \*/ background-color: rgb(0,0,0); /\* Fallback color \*/

background-color: rgba(0,0,0,0.4); /\* Black w/ opacity \*/ padding-top: 60px;

background-image: url('background.jpg'); background-repeat: no-repeat; background-size: cover;

}

/\* Modal Content/Box \*/

.modal-content { background-color: #fefefe;

margin: 5% auto 15% auto; /\* 5% from the top, 15% from the bottom and centered \*/

border: 1px solid #888;

width: 80%; /\* Could be more or less, depending on screen size \*/

}

/\* The Close Button (x) \*/

.close {

position: absolute; right: 25px;

top: 0;

color: #000; font-size: 35px;

font-weight: bold;

}

.close:hover,

.close:focus { color: red; cursor: pointer;

}

/\* Add Zoom Animation \*/

.animate {

-webkit-animation: animatezoom 0.6s; animation: animatezoom 0.6s

}

@-webkit-keyframes animatezoom { from {-webkit-transform: scale(0)} to {-webkit-transform: scale(1)}

}

@keyframes animatezoom { from {transform: scale(0)} to {transform: scale(1)}

}

/\* Change styles for span and cancel button on extra small screens \*/ @media screen and (max-width: 300px) {

span.psw { display: block;

float: none;

}

.cancelbtn { width: 100%;

}

}

</style>

</head>

<body>

<h2>NEW USER ?</h2>

<button onclick="document.getElementById('id01').style.display='block'" style="width:auto;" class="loginbtn">Login</button>

<button onclick="window.location.href='createacc.html'"class="createact" style="width:auto;"><b>Create Account</b></button>

<div id="id01" class="modal" >

<form class="modal-content animate" action="/action\_page.php" method="post">

<div class="imgcontainer">

<span onclick="document.getElementById('id01').style.display='none'" class="close" title="Close Modal">&times;</span>

<img src="image2.jpg" alt="Avatar" class="avatar">

</div>

<div class="container">

<label for="uname"><b>Username</b></label>

<input type="text" placeholder="Enter Username" name="uname" required>

<label for="psw"><b>Password</b></label>

<input type="password" placeholder="Enter Password" name="psw" required>

<br>

<button onclick="window.location.href='main.html'"class="login2" style="width:auto;"><b>Login</b></button> <br>

<label>

<input type="checkbox" checked="checked" name="remember"> Remember

</label><br>

</div>

<div class="container" style="background-color:#f1f1f1">

<button type="button" onclick="document.getElementById('id01').style.display='none'" class="cancelbtn">Cancel</button>

<span class="psw">Forgot<a href="#">password?</a></span>

</div>

</form>

</div>

<script>

// Get the modal

var modal = document.getElementById('id01');

// When the user clicks anywhere outside of the modal, close it window.onclick = function(event) {

if (event.target == modal) { modal.style.display = "none";

}

}

</script>

</body>

</html>

# Main.html:

<!DOCTYPE html>

<html lang="en">

<head>

<title>Collabrative Learning</title>

<meta charset="utf-8">

<meta name="viewport" content="width=device-width, initial-scale=1">

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/js/bootstrap.min.js"></scrip t>

<style>

.fakeimg { height: 200px;

background: #aaa;

}

body {

font-family: Arial, Helvetica, sans-serif; background-image: url('b.jfif'); background-repeat: no-repeat; background-size: cover;

}

a:visited {

size: 100px; color: black;

background-color: transparent; text-decoration: none;

}

a:hover { color: blue;

background-color: transparent; text-decoration: underline;

}

a:link {

font-size: 17px;

}

td{

}

text-align: center;

th,td{

padding:10px;

}

.scroll{

text-align: center;

}

</style>

</head>

<body>

<!--<div >

<img src="main1.jfif" class="img1">

</div>-->

<nav class="navbar navbar-inverse">

<div class="container-fluid">

<div class="navbar-header">

<button type="button" class="navbar-toggle" data-toggle="collapse" data- target="#myNavbar">

<span class="icon-bar"></span>

<span class="icon-bar"></span>

<span class="icon-bar"></span>

</button>

<a class="navbar-brand" href="#">Kavitha</a>

<a class="navbar-brand" href="#">211417104120</a>

<a class="navbar-brand" href="#">Final Year</a>

</div>

<div class="collapse navbar-collapse" id="myNavbar">

<ul class="nav navbar-nav">

<li><a href="main.html">Courses</a></li>

<li><a href="skills.html">Add Skills</a></li>

<li><a href="profile.html">Profile</a></li>

<li><a href="placement.html">Placement</a></li>

</ul>

</div>

</div>

</nav>

<div class="container">

<div class="row">

<div class="col-sm-4">

<h2>Skills</h2>

<ul class="nav nav-pills nav-stacked">

<li><a href="web\_designer.html">Web Designer</a></li>

<li><a href="#">Python Developer</a></li>

<li><a href="#">MERN Stack Developer</a></li>

<li><a href="#">MEAN Stack Developer</a></li>

<li><a href="#">Hacker</a></li>

<li><a href="#">Webmaster</a></li>

<li><a href="#">Data Analyst</a></li>

<li><a href="#">Data Scientist</a></li>

</ul>

<hr class="hidden-sm hidden-md hidden-lg">

</div>

<div class="col-sm-8">

<h2>Basic Courses</h2>

<table style="width:50%"><tr>

<td>

<a href="https://[www.udemy.com/course/c-course-learn-2-code-develop-problem-](http://www.udemy.com/course/c-course-learn-2-code-develop-problem-) solving-skills-in-c/"><img src="c.jfif"></a> </td>

<td><a href="https://[www.codecademy.com/learn/learn-c-plus-](http://www.codecademy.com/learn/learn-c-plus-) plus"><img src="c++.png"> </a></td>

</tr>

<tr>

<td><a href="https://cognitiveclass.ai/courses/learn-sql-relational- databases"><img src="database.jfif"></a> </td>

<td><a href="https://[www.coursera.org/learn/intro-](http://www.coursera.org/learn/intro-) sql?utm\_medium=institutions&utm\_source=umich&utm\_content=sem&utm\_camp aign=adwords-web-applications-for-everybody-introduction-to-structured-query- language&utm\_term=sql%20course&gclid=Cj0KCQjw0oCDBhCPARIsAII3C\_G wofmkVr9NdMsIW4yNg7aZm6g54gtyhTVKCrY4HYfP5a6TmHCa60waAuhXE ALw\_wcB"><img src="sql.png"></a></td>

</tr>

</table>

</div>

</div>

</div>

<div class="jumbotron text-center" style="margin-bottom:0">

<marquee direction="up" height="150" width=85% bgcolor="#B6F1CD " behavior="scroll" scrolldelay= 100 hspace=100px>

<h2><b>Trending Course. </b></h2>

<p> Data Science<br> Machine learning</p>

<h2><b>Upcomimg Events </b></h2>

</marquee>

</div>

</body>

</html>

# Profile.html:

<!DOCTYPE html>

<html lang="en">

<head>

<title>Collabrative Learning</title>

<meta charset="utf-8">

<meta name="viewport" content="width=device-width, initial-scale=1">

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/js/bootstrap.min.js"></scrip t>

<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font- awesome/4.7.0/css/font-awesome.min.css">

<style> body {

font-family: Arial, Helvetica, sans-serif; background-image: url(b3.png); background-repeat: no-repeat; background-size: cover;

}

input[type=text], input[type=password], select{ width: 85%;

height: 100px; padding: 15px; margin: 8px 0 ; display: inline-block; border: 1px solid #ccc; border-radius: 4px;

box-sizing: border-box; background: #DCDCDC;

}

input[type=text]:focus, input[type=password]:focus { background-color: #ddd;

outline: none;

}

.registerbtn { background-color: black; position: absolute;

left: 5%; color: white;

padding: 16px 20px; margin: 8px 0; border: none; cursor: pointer; width: 50%;

opacity: 0.9;

}

.registerbtn:hover { background-color: grey; opacity: 1;

}

.heading {

font-size: 18px; margin-right: 25px;

}

.fa {

font-size: 25px;

}

.checked { color: orange;

}

.edit{ height:30%; width: 20%;

}

.col-sm-4{ width: 50%;

}

.col-sm-8{ width: 50%;

}

td{

text-align: left;

}

th{

text-align: center;

}

td, th {

padding: 5px;

}

/\* Popup container - can be anything you want \*/

.popup {

position: relative; display: inline-block; cursor: pointer;

-webkit-user-select: none;

-moz-user-select: none;

-ms-user-select: none;

user-select: none; height: 100%;

width: 100%;

}

/\* The actual popup \*/

.popuptext { visibility: hidden; width: 160px;

background-color: #555; color: #fff;

text-align: center; border-radius: 6px; padding: 8px 0; position: absolute; z-index: 1;

bottom: 125%;

left: 50%;

margin-left: -80px;

}

/\* Popup arrow \*/

.popup .popuptext::after { content: "";

position: absolute; top: 100%;

left: 50%;

margin-left: -5px; border-width: 5px; border-style: solid;

border-color: #555 transparent transparent transparent;

}

/\* Toggle this class - hide and show the popup \*/

.popup .show {

visibility: visible;

-webkit-animation: fadeIn 1s; animation: fadeIn 1s;

}

/\* Add animation (fade in the popup) \*/ @-webkit-keyframes fadeIn {

from {opacity: 0;}

to {opacity: 1;}

}

@keyframes fadeIn { from {opacity: 0;} to {opacity:1 ;}

}

a:link {

font-size: 17px;

}

</style>

</head>

<body>

<!--<div >

<img src="main1.jfif" class="img1">

</div>-->

<nav class="navbar navbar-inverse">

<div class="container-fluid">

<div class="navbar-header">

<button type="button" class="navbar-toggle" data-toggle="collapse" data- target="#myNavbar">

<span class="icon-bar"></span>

<span class="icon-bar"></span>

<span class="icon-bar"></span>

</button>

<a class="navbar-brand" href="#">Kavitha</a>

<a class="navbar-brand" href="#">211417104120</a>

<a class="navbar-brand" href="#">Final Year</a>

</div>

<div class="collapse navbar-collapse" id="myNavbar">

<ul class="nav navbar-nav">

<li ><a href="main.html">Courses</a></li>

<li><a href="skills.html">Add Skills</a></li>

<li><a href="profile.html">Profile</a></li>

<li><a href="placement.html">Placement</a></li>

</ul>

</div>

</div>

</nav>

<div class="container">

<div class="row">

<div class="col-sm-4">

<h2><b>Profile</b></h2>

<label for="name" class="heading"><b>Edit Profile</b></label>

<a href="edit.html"><img class="edit" src="edit.jfif"></a><br>

<label for="name" class="heading"><b>Edit Login Credentials</b></label>

<a href="edit.html"><img class="edit" src="edit.jfif"></a><br><br>

<label for="name" class="heading"><b>Download Resume</b></label>

<div class="popup" onclick="myFunction()">

<img class="edit" src="download.png"><br>

<span class="popuptext" id="myPopup"> Done</span>

</div>

<span class="heading"><b> Rating</b></span>

<span class="fa fa-star checked"></span>

<span class="fa fa-star checked"></span>

<span class="fa fa-star checked"></span>

<span class="fa fa-star "></span>

<span class="fa fa-star"></span>

<br><br>

<label for="name" class="heading"><b>Write A Review</b></label><br>

<input type="text" name="name" id="name" required/><br>

<br> <div class="popup" onclick="myFunction()">

<button class="registerbtn" style="width: auto;">Submit</button>

<span class="popuptext" id="myPopup">Review Submitted Successfully</span>

</div>

<script>

// When the user clicks on div, open the popup function myFunction() {

var popup = document.getElementById("myPopup"); popup.classList.toggle("show");

}

</script>

</div>

<div class="col-sm-8">

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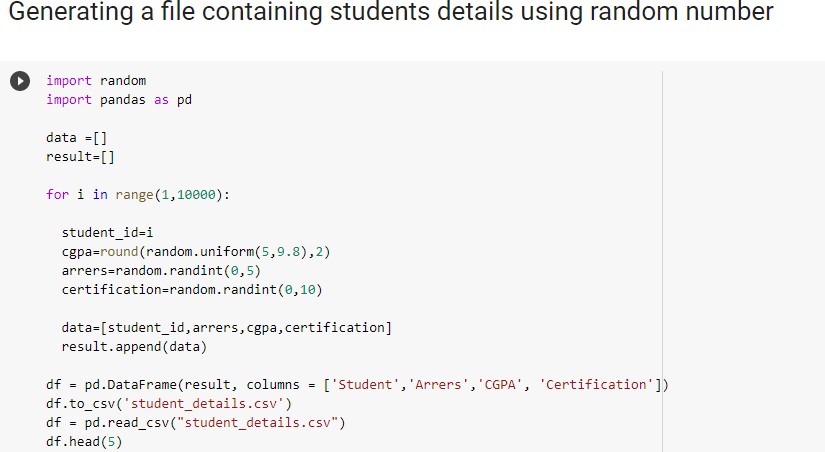
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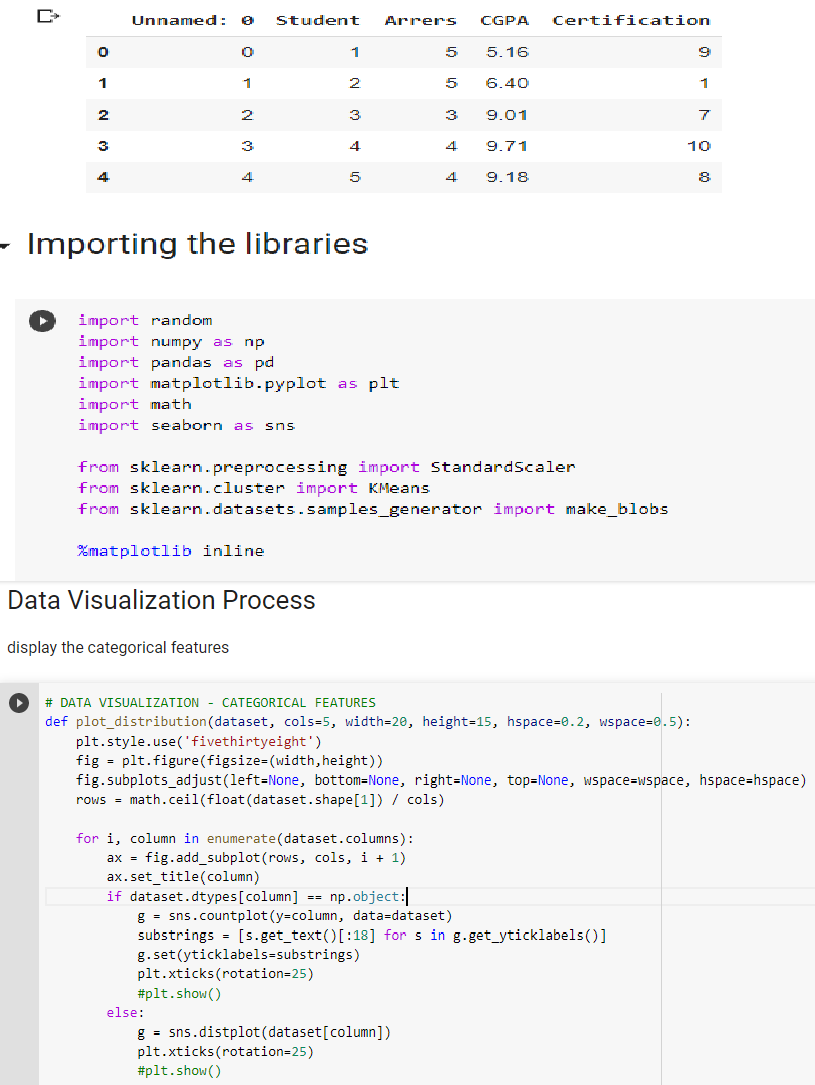
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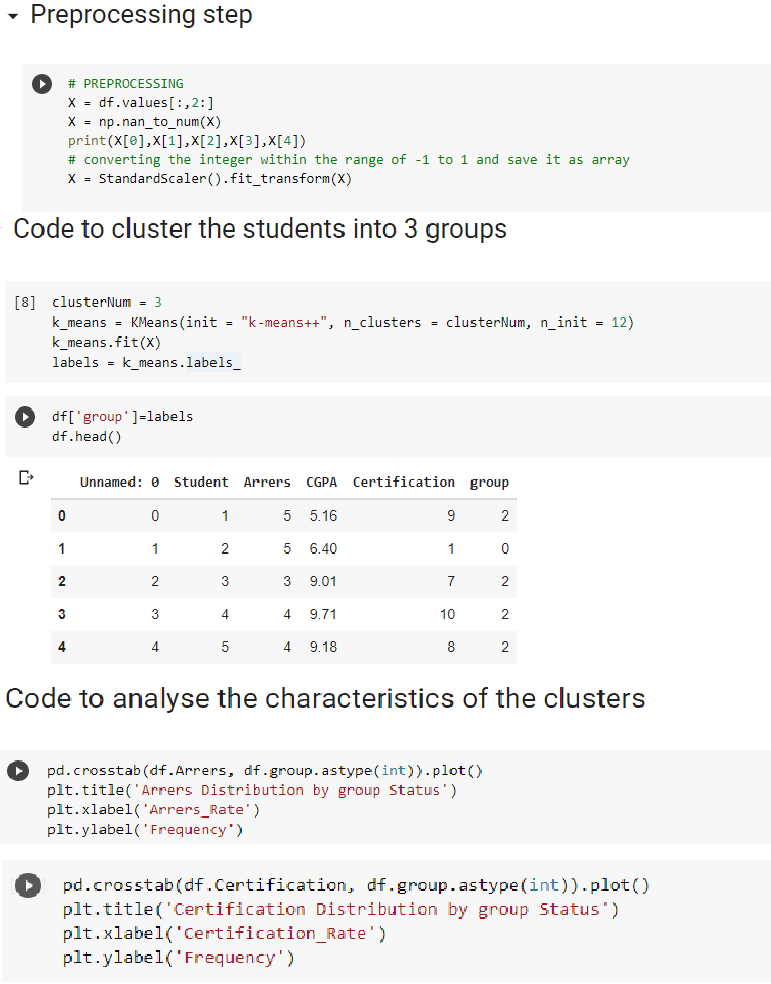
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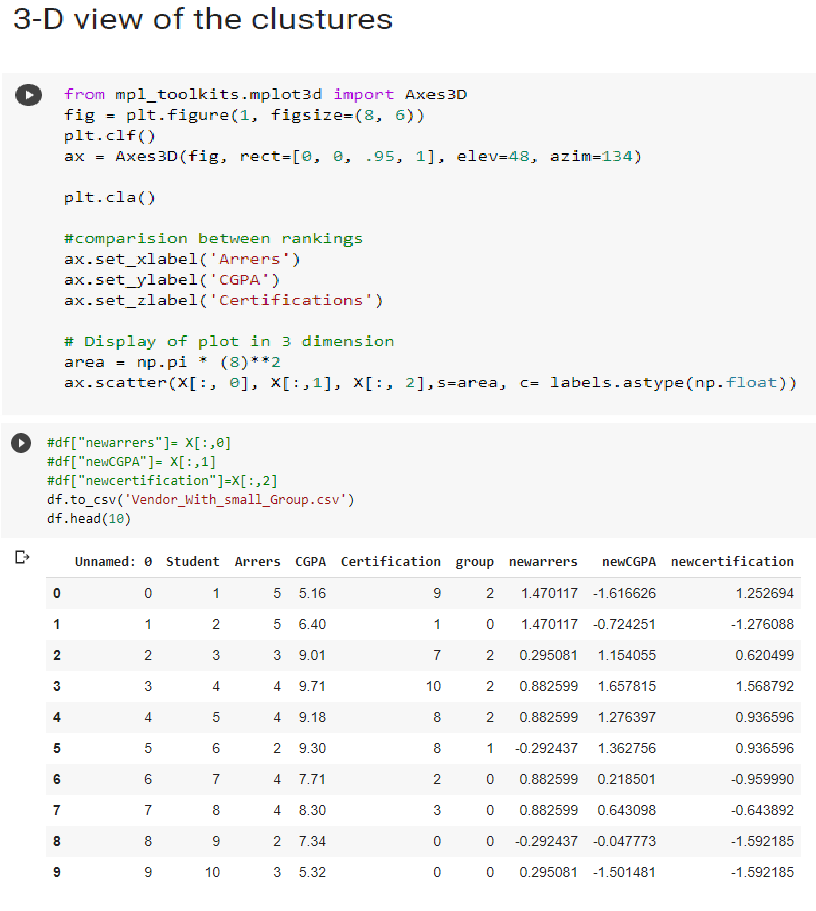
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# SERVER SIDE CODING









**CHAPTER-7 SYSTEM TESTING**

# TESTING

The development of a software system involves a series of production activities where opportunities for injection of human fallibilities are enormous. Errors may begin to occur at the very inception of the process where the objectives may be erroneously or imperfectly specified, as well as errors that occur in later design and development stages. Because of human inability to perform and communicate with perfection, software development is accompanied by a quality assurance activity.

Software Testing is a critical element of software quality assurance and represents the ultimate review of specification, design and coding. Testing is a set of activities that can be planned in advance and conducted systematically. For this reason, a template for software testing-a set of steps into which we can place specific test case design techniques and testing methods-should be designed for the software engineering process.

# OBJECTIVES OF TESTING:

1. Testing is a process of executing a program with the intent of finding an error,
2. A good test case is one that has a high probability of finding an as yet and discovered error,
3. A successful test is one that uncovers an as yet undiscovered error.

If testing is conducted successfully it will uncover errors in the software. As a secondary benefit, testing demonstrates that software functions appear to be working according to specification, that performance requirements appear to have been met in addition, data collected as testing is conducted provide good indication of software reliability and some indication of software quality as a whole. Testing cannot show the absence of errors, it can only show that software defects are present

# BLACK BOX TESTING

Black-box testing, also called behavioral testing, focuses on the functional requirements of the software. That is, black-box testing enables the software engineer to derive sets of input conditions that will fully exercise all functional requirements for a program. Black-box testing is not an alternative to white-box techniques. Rather, it is a complementary approach that is likely to uncover a different class of errors than white-box Methods. Black-box testing attempts to find errors in the following categories:

* + - * Incorrect or missing functions.
      * Interface errors
      * Errors in data structures or external data base access
      * Behavior or performance errors.
      * Initialization and termination errors.

# WHITE BOX TESTING

White-box testing, sometimes called glass-box testing, is a test case design method that uses the control structure of the procedural design to derive test cases. Using white-box testing methods, the software engineer can derive test cases that

* + - * Guarantee that all independent paths within a module have been
      * exercised at least once.
      * Exercise all logical decisions on their true and false sides.
      * Execute all loops at their boundaries and within their operational bounds.
      * Exercise internal data structures to ensure their validity.

# TESTING STRATEGIES

Four Testing Strategies that are often adopted by the software development team include:

* + - * Unit Testing
      * Integration Testing
      * Validation Testing
      * System Testing

# UNIT TESTING

Unit testing focuses verification effort on the smallest unit of the software design and the module. Using the detail design description as a guide, important control paths are tested to uncover errors within the boundary of the module. The relative complexity of the tests and the errors detected as a result is limited by the constrained scope established for unit testing. The unit test is always white-box oriented, and the step can be conducted in parallel for multiple modules.

The module interface is tested to ensure that information properly flows into and out of the program unit under test. The local data structure is examined to ensure that data stored temporarily maintains its integrity during all steps in an algorithms execution. All independent paths through the control structures are exercised to ensure that all statements in a module have been executed at least once. And finally, all error-handling paths are tested. Because a module is not a stand-alone program, a driver and/ or stub software must be developed for each unit test.

In most applications a driver is nothing more than a " main program” that accepts test case data to the module to be tested, and prints the relevant results. Stubs serve to replace modules interface, may do minimal data manipulation, prints verification of entry, and returns. Unit testing for our project was conducted in full. The basic modules were further subdivided into sub-modules and unit testing was conducted on each such module. The modules were tested for boundary conditions, independence paths, error handling paths and presentation of exact for the given input.

# INTEGERATION TESTING

After finishing the Unit Testing process, next is the integration testing process. In this testing process we put our focus on identifying the interfaces between components and their functionality as dictated by the DFD diagram. The Bottom up incremental approach was adopted during this testing. Low level modules are integrated and combined as a cluster before testing.

The Black box testing technique was employed here. The interfaces between the components were tested first. This allowed identifying any wrong linkages or parameters passing early in the development process as it just can be passed in a set of data and checked if the result returned is an accepted one.

Top-Down Integration is an incremental approach to the construction of program structure. Modules are integrated by moving downward through the control hierarchy, beginning with the main control module. Modules subordinate to the main control module are incorporated into the structure in either a depth-first manner.

Bottom-Up Integration testing, as its name itself implies, begins construction and testing with the atomic modules. Because modules are integrated from the bottom up, Processing required for modules subordinate to a give level is always available and the need for stubs is eliminated.

# VALIDATION TESTING

Software testing and validation is achieved through a series of black box tests that demonstrate conformity with requirements. A test procedure defines specific test cases that will be used to demonstrate conformity with requirements. Both, the plan and the procedure are designed to ensure that all functional requirements are achieved, documentation is correct and other requirements are met. After each validation test case has been conducted, one of the two possible conditions exists.

1. The function or performance characteristics conform to specification and are accepted.
2. A deviation from specification is uncovered and a deficiency list is created.

The deviation or error discovered at this stage in project can rarely be corrected prior to scheduled completion. It is necessary to negotiate with the customer to establish a method for resolving deficiencies.

# SYSTEM TESTING

Software is incorporated with other system elements and a series of system integration and validation tests are conducted. These tests fall outside the scope of the software engineering process and are conducted solely by the software developer. However, steps taken during software design and testing can greatly improve the probability of successful software integration in the larger system.

System testing is actually a series of different tests whose primary purpose is to fully exercise the computer-based system Although each test, has a different purpose, all work should verify that all system elements have been properly integration and perform allocated functions.

# DEBUGGING

It is the process of isolation and correcting the cause known errors.

Success at debugging requires highly developed problem-solving skills. Commonly used debugging methods include backtracking, induction, and deduction

# Debugging by backtracking:

Working backward in the source code from the point where the error has observed in an attempt to identify the exact point where the error occurred. Additional tests are done.

# Debugging by induction:

* + Collect the available information,
  + Look for patterns.
  + Form one or more hypothesis.
  + Prove or disprove each hypothesis.
  + Implement the appropriate corrections.
  + Verify the corrections

# Debugging by deduction:

1. List the possible causes for the absurd failure.
2. Use the available information to eliminate various hypotheses.
3. Elaborate the remaining hypothesis.
4. Prove and disprove each hypothesis.
5. Determine the appropriate corrections.
6. Verify the corrections.

# SYSTEM ANALYSIS

System Analysis is an activity that encompasses most of the tasks that we have collectively called computer system engineering. System Analysis is conducted with the following objectives in mind:

* Identity the customers need
* Evaluate the system concept for feasibility
* Perform economic and technical analysis
* Allocate functions to networks, software, people, database and other system elements
* Establish cost and schedule constraints
* Create a system definition that forms the foundation for all subsequent engineering work.

# TEST CASES

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TEST CASE ID** | **TEST CASE** | **EXPECTED RESULT** | **ACTUAL RESULT** | **STATUS PASS / FAIL** |
| ENTER E-MAIL | VERIFY E-MAIL | CORRECT E-MAIL | CORRECT E-MAIL | PASS |
| ENTER E-MAIL | VERIFY E-MAIL | CORRECT E-MAIL | INCORRECT E-MAIL | FAIL |
| ENTER PASSWORD | VERIFY PASSWORD | CORRECT PASSWORD | INCORRECT PASSWORD | PASS |
| ENTER PASSWORD | VERIFY PASSWORD | CORRECT PASSWORD | INCORRECT PASSWORD | FAIL |
| FORGET PASSWORD | RESET PASSWORD | PASSWORD CHANGED | PASSWORD CHANGED | PASS |
| FORGET PASSWORD | RESET PASSWORD | PASSWORD CHANGED | PASSWORD  DOESN’T GET  CHANGED | FAIL |

## Table 2: Test Cases for Login Screen

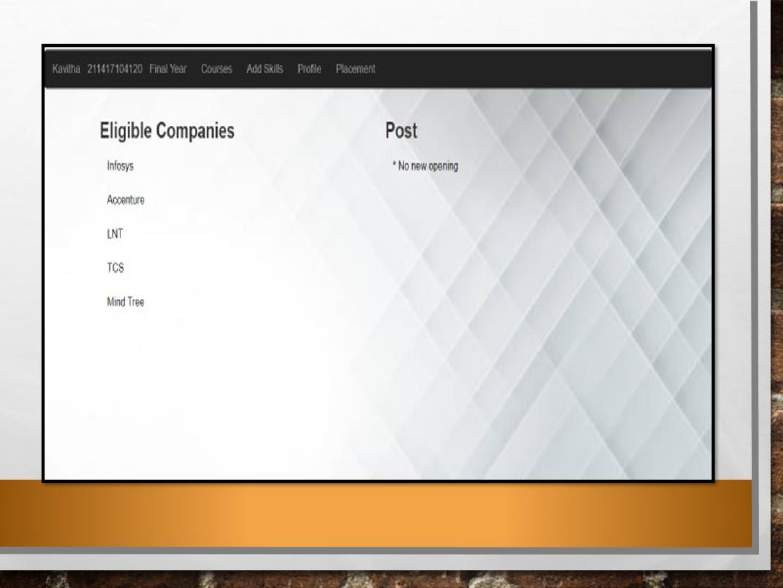
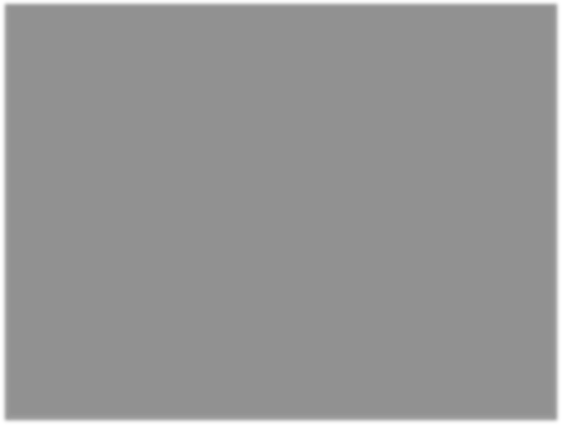
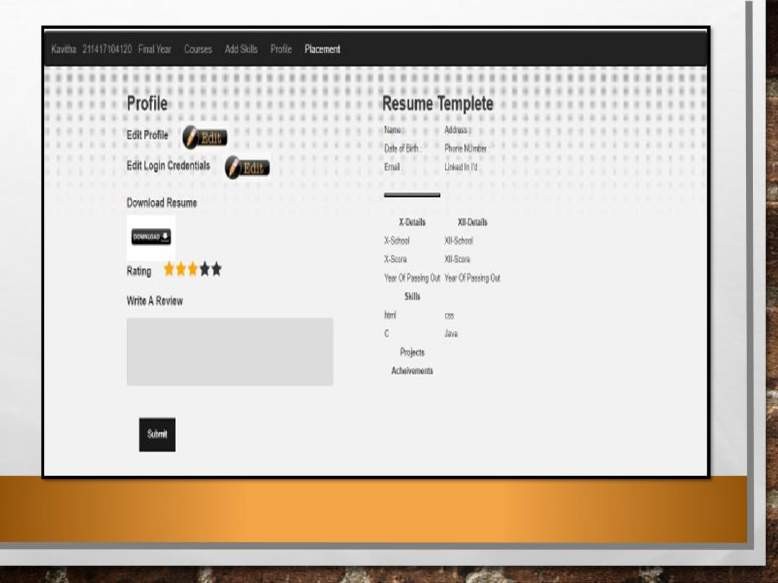
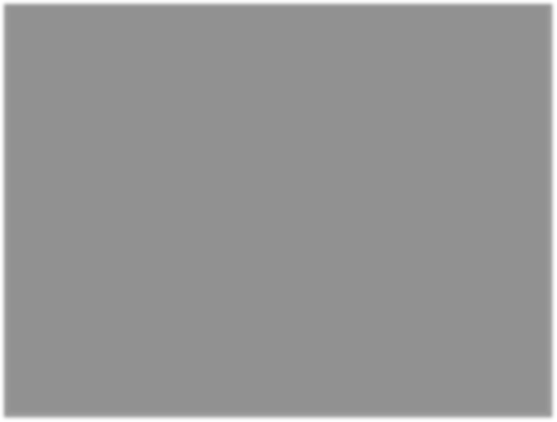
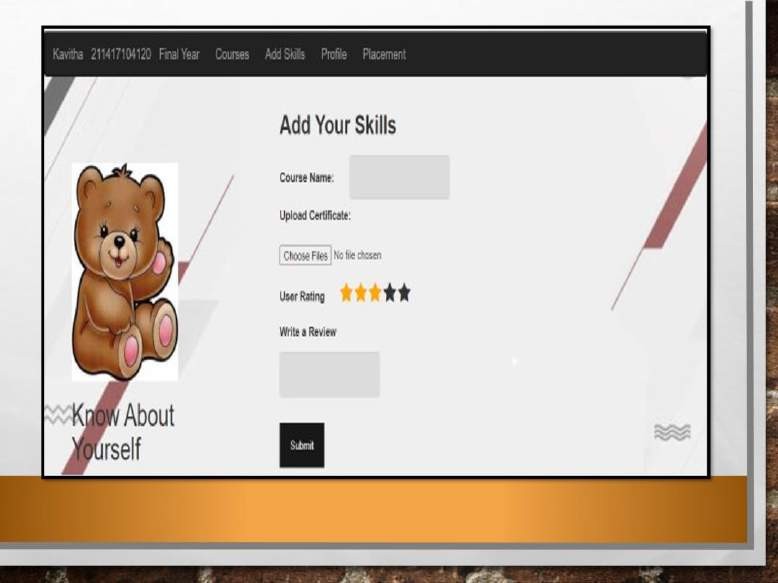
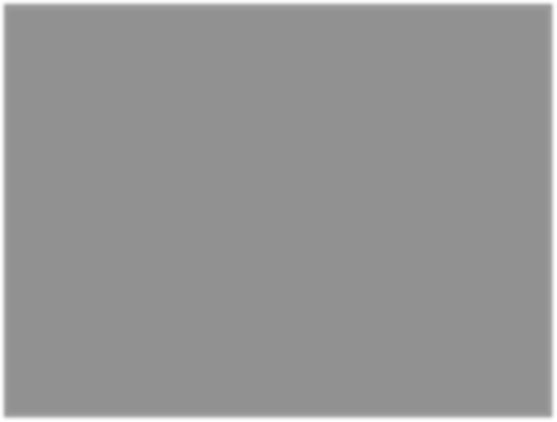
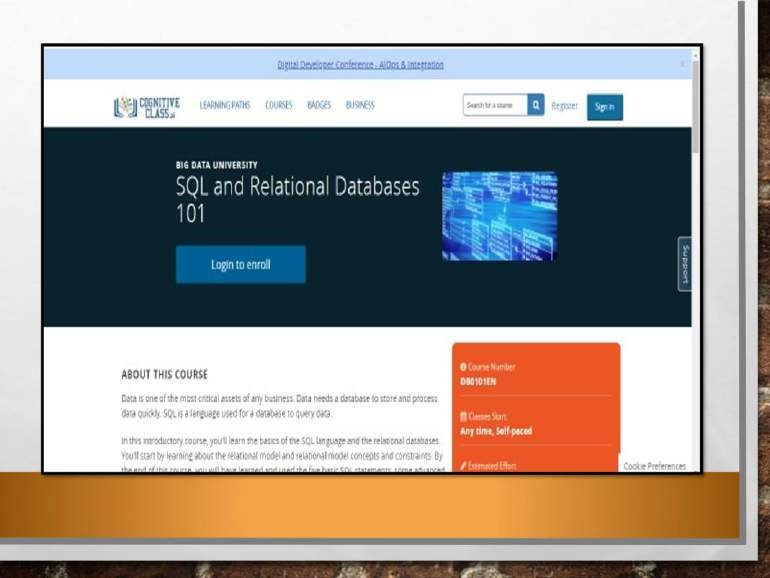
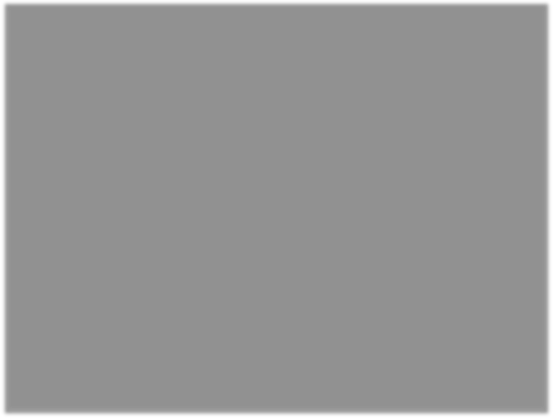
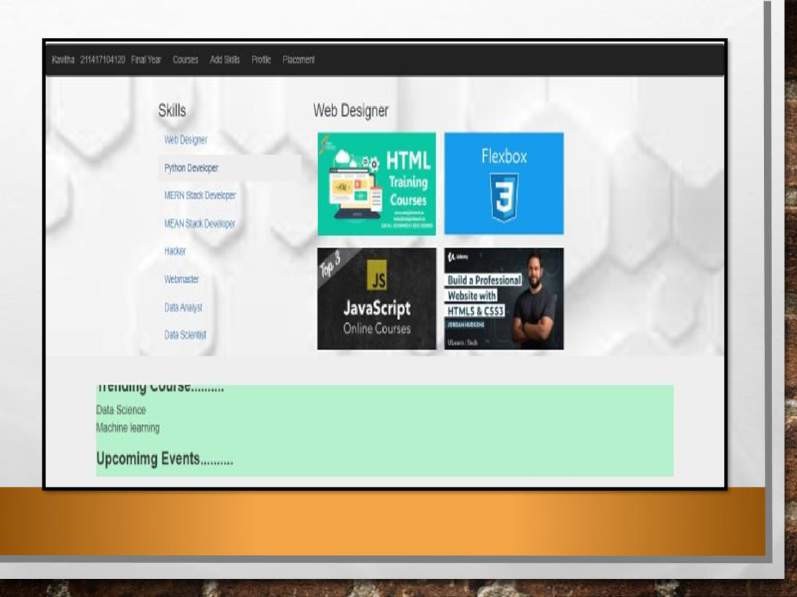
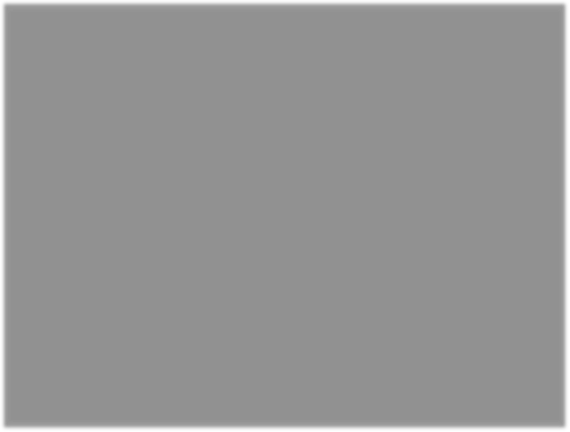
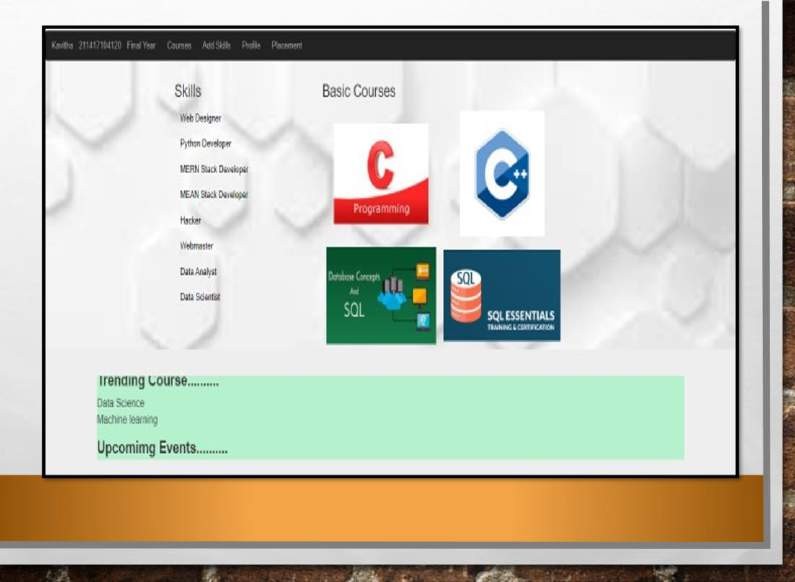
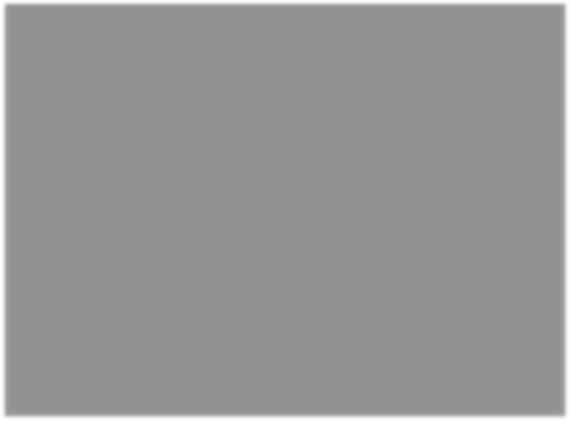
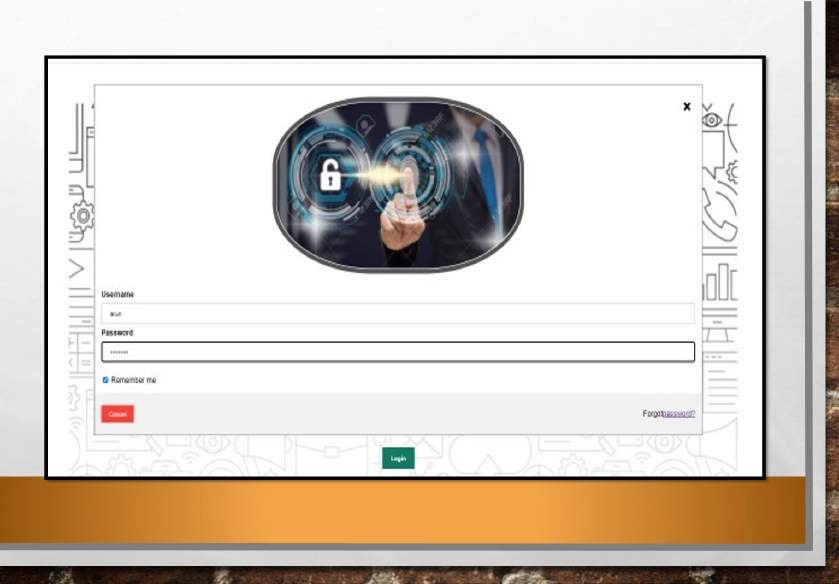
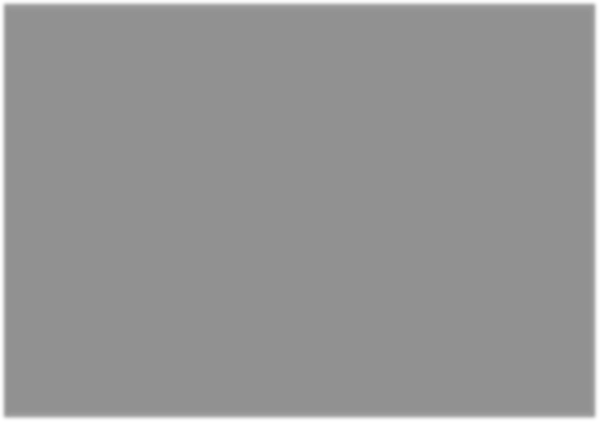
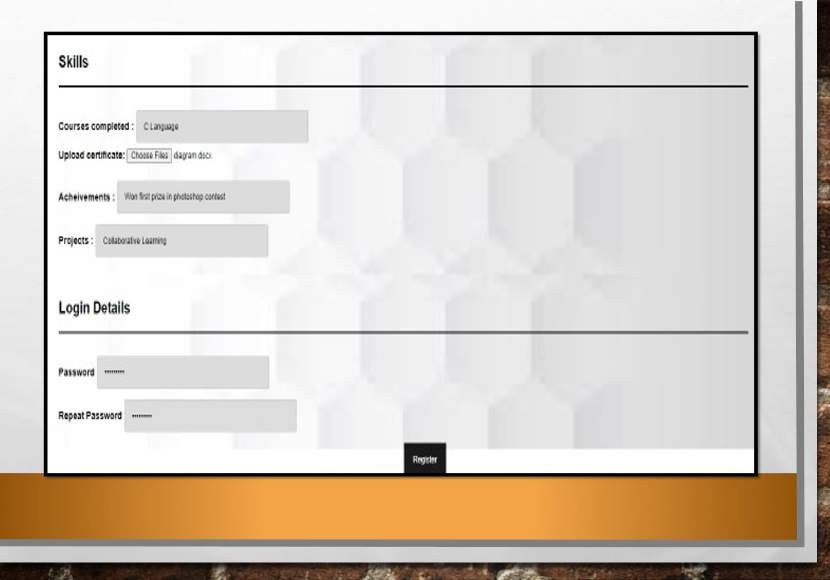
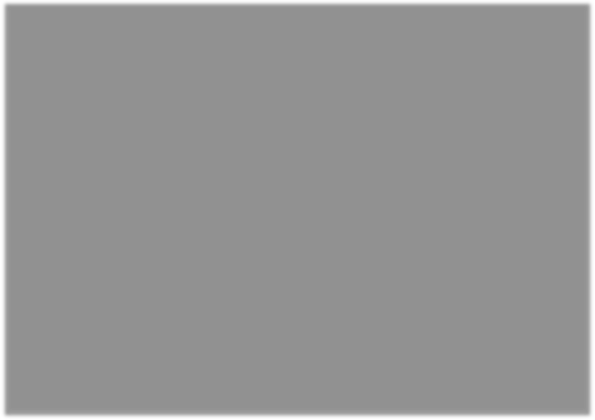
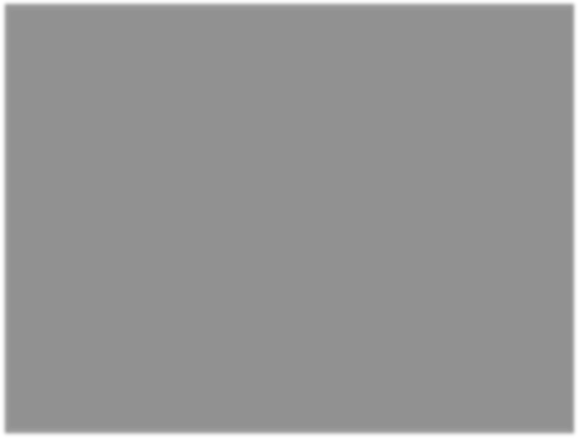
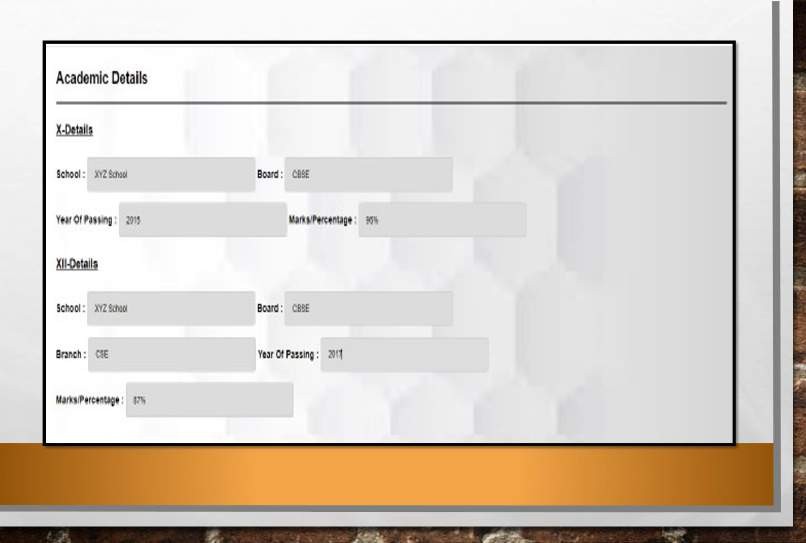
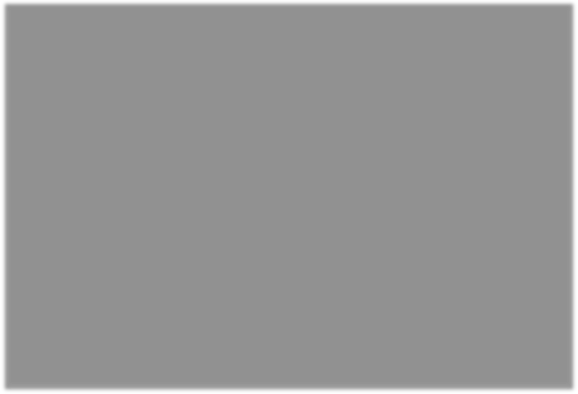
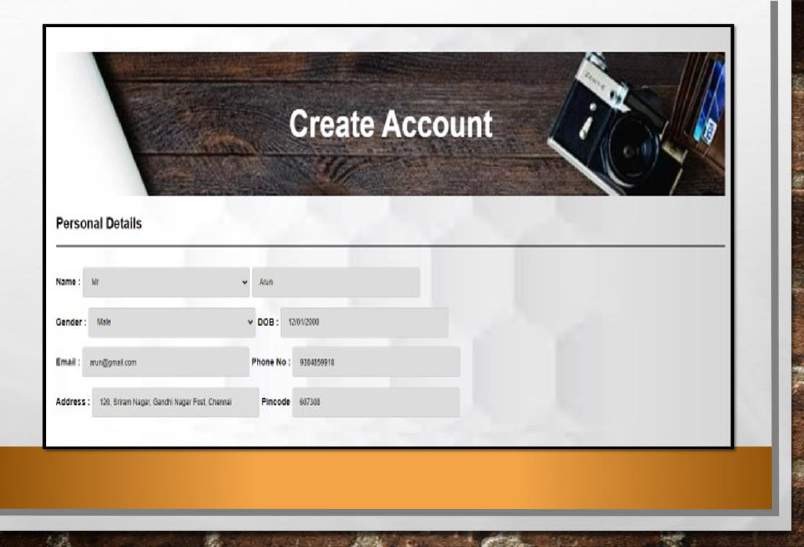
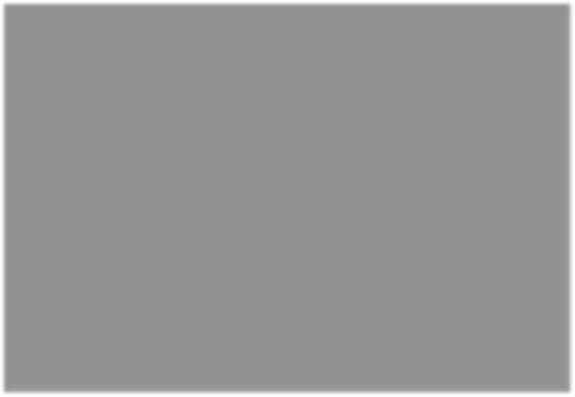
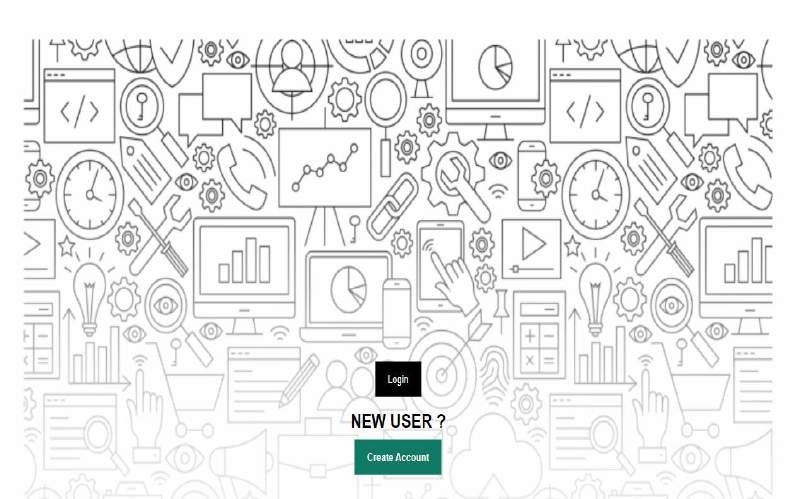
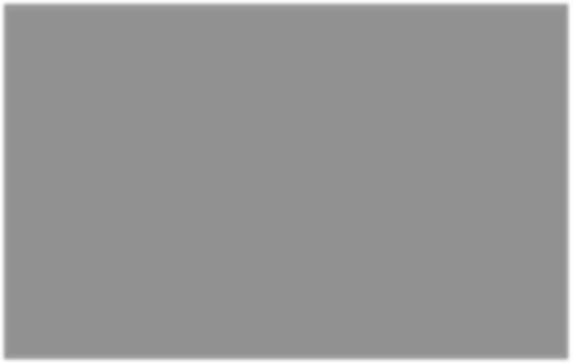
**CHAPTER-8 CONCLUSION**

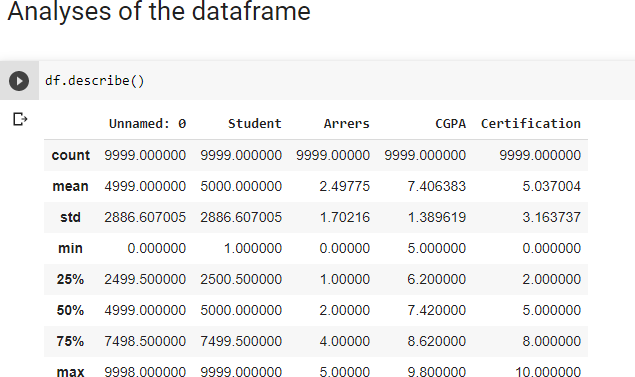
**8.1 CONCLUSION AND FUTURE ENHANCEMENT**

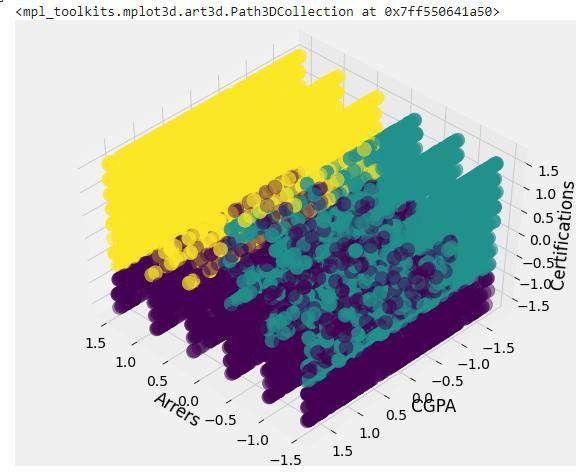
Collaborative learning (digital platform) is very useful to maintain demand supply between the institute and industry. In today’s world, sharing knowledge through the internet becomes the most effective way. This platform cultivates the habit of upskilling a student by sharing the Knowledge they gain. This quality is very muchneeded for the companies. Students are monitored and focused by a guide to track them on the right path to gain their knowledge. Many students didn’t get enough information about what to learn, where to learn, what is expected, what is the eligibility criteria required by the companies. This digital platform acts as a solution for all these issues and improves their skills on their own. This makes them fix enough to all the needs and requirements of the growing industrial world by choosing the correct courses at the correct time.

# APPENDICES

**SAMPLE SCREEN**







**REFERENCE**

1. Zheng Ninghan, Tian Shuzhen and Chen Yongqiang (2015) Online Learning Management System, International Conference on Computational Science and Computational Intelligence
2. Seyed Mohammadbagher Jafari, Suha Fouad, Mohaddece Sadat Moaddab and Sharif Omar (2015) Learning Management System (LMS) Success: An Investigation Among the University Students, IEEE Conference on e-Learning,e-

Management and e-Services

1. Chih-Hung Chung, Laura A and Chang E.Koh (2013) Web-based Learning Management System Considerations for Higher Education, Article in International Journal of Scientific and Engineering Research
2. Chirag Patel, Mahesh Gadhavi, Dr. Atul Patel (2013) A survey paper on e-learning based learning management Systems (LMS), Article in International Journal of Scientific and Engineering Research
3. Shi Na, Liu Xumin and Guan Yong (2010) Research on k-means Clustering Algorithm: An Improved k-means Clustering Algorithm, Third International Symposium on Intelligent Information Technology and Security informatics.
4. Saroj, Tripti Chaudhary (2015) Study on Various Clustering Techniques,

International Journal of Computer Scienceand Information Technologies

1. Oyelade O.J, Oladipupo, O.O and Obagbuwa I.C (2010) Application of k- Means Clustering algorithm for prediction of Student’s Academic Performance, International Journal of Computer Science and Information Security.
2. Shi Na, Liu Xumin and Guan Yong (2010) Research on k-means Clustering Algorithm: An Improved k-means Clustering Algorithm, Third International Symposium on Intelligent Information Technology and Security informatics.
3. Kamalpreet Bindra, Anuranjan Mishra (2017) A Detailed Study of Clustering Algorithms, IEEE
4. Patricia Fidalgo,Joan Thormann,Oleksandr Kulyk & José Alberto Lencastre (2020)Students’ perceptions on distance education: A multinational study, International Journal of Education Technology in Higher Education.
5. Nor Azura Adzharuddin (2013) learning Management System (LMS) among University Students: Does It Work? , International Journal of e-Education e-

Business e-Management and e-Learning

1. [Slavko Rakic](https://ieeexplore.ieee.org/author/37087133067), [Marko Pavlovic](https://ieeexplore.ieee.org/author/37088345653), [Selver Softic](https://ieeexplore.ieee.org/author/37087134728), [Bojan Lalic](https://ieeexplore.ieee.org/author/38108818900), [Ugljesa Marjanovic](https://ieeexplore.ieee.org/author/37086243732) (2019) An Evaluation of Students Performance at e-learning Platform , IEEE
2. [Zhenfan Ding](https://ieeexplore.ieee.org/author/37404399300), [Rong Li](https://ieeexplore.ieee.org/author/37406149000) (2010) Design of Web Based Reached E-learning Platform, IEEE
3. Slavko Rakic, Nemanja Tasic, Ugljesa Marjanovic , Student Performance on E-Learning Platform: Mixed Method Approach (2020) International Journal of Emerging Technologies
4. Chih-Hung Chung, Laura A and Chang E.Koh (2013) Web-based Learning Management System Considerations for Higher Education, Article in International Journal of Scientific and Engineering Research

# PUBLICATION

[1] M Kiruthika, P Vinitha and G Sinthiya (2021) Digital Solution for A Guide to Make the Student Capable of Hopping the Corporate World, 4th International Conference on Intelligent Computing ( IConIC )

[2]

