

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND**

**TECHNOLOGY (JKUAT)**

**DEPARTMENT OF COMPUTING**

**BCT 2411: COMPUTER SYSTEMS PROJECT**

**SYSTEM REPORT**

**REF: JKU/2/83/022**

**TITLE: STUDENT DECISION SUPPORT SYSTEM FOR HIGHER LEARNING ENROLLMENT**

**Author**:

**Name**: HEZION KWENA MAKOKHA **Reg. No**: SCT212-0222/2017 **Sign**: H.K.M

**Name**: LEWIS MWENDWA KATHEMBE **Reg. No**: SCT212-0339/2016 **Sign**: L.M.K

**Course**: B. Sc. Computer Technology

**Date**: 11th January 2022

**Supervisor 1**:

**Name**: Dr. LAWRENCE NDERU **Sign**: Dr. L.N **Date**: 11th January, 2022

**Supervisor 2**:

**Name**: **Sign**: **Date:**

A project submitted to School of Computing and Information Technology for the Bachelor of Science Degree in Computer Science at Jomo Kenyatta University of Agriculture and Technology (JKUAT)

**Period: April 2021 – January 2022**

**DECLARATION**

We declare that this project is our original work and has been submitted to Jomo Kenyatta University of Agriculture and Technology for examination and/or award of a Bachelor’s of Science degree in Computer Technology.

**Hezion Kwena Makokha.**

**Lewis Mwendwa Kathembe.**

**ACKNOWLEDGEMENT**

We would like to acknowledge God Almighty for the strength, sound mind and provision during the period of study. Special thanks to our supervisors Dr. Lawrence Nderu and Dr. Karanja for their support, guidance and patience, and without their constructive criticism and advice this work would not have been complete. We also register our gratitude to our university department administration for providing an enabling environment for us to complete the course and providing access to the computer laboratories and resources when approached and to our parents and siblings for their continuous encouragement during this journey. Also, thank you to all our friends who contributed to the completion of this academic document both directly and indirectly. They provided us with logistical and moral support that gave us every reason to work harder and ensure that this study becomes a success.

To all of you, God bless and increase you immensely.

**TABLE OF CONTENTS**

[1. PROJECT PROPOSAL - 7 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599098)

[ABSTRACT - 7 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599099)

[BACKGROUND/INTRODUCTION - 8 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599100)

[PROBLEM STATEMENT - 8 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599101)

[JUSTIFICATION - 9 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599102)

[LITERATURE RELEVANT TO YOUR PROPOSAL - 9 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599103)

[RESEARCH METHODS AND DESIGN - 9 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599104)

[METHODOLOGY -10 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599105)

[SCHEDULE - 11 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599106)

[BUDGET - 11 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599107)

[CONCLUSION - 12 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599109)

[2. SYSTEM DESIGN & ANALYSIS - 13 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599120)

[SYSTEM USE CASES - 13 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599121)

APPLICATION PRODUCT [- 13 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

ASSUMPTIONS MADE [- 13 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

DATABASE SCHEMAS [- 13 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

WEBSITE ACCESS [- 13 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

SYSTEM REGISTRATION [- 13 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

SYSTEM ACCESS [- 13 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

PORTAL FUNCTIONS [- 14 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599123)

Institution Portal [- 14 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599125)

Student Portal [- 14 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

system diagram/flowchart [- 16 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599126)

system optimization model [- 17 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599127)

system requiremnts [- 18 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599129)

Web Application Hardware Requirements [- 18 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

Network Requirements [- 18 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599122)

[3. SYSTEM TESTING & IMPLEMENTATION - 19 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599150)

DEVELOPMENT  [- 19 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599156)

WEBSITE APPLICATION IMPLEMENTATION [- 19 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599151)

USER INTERFACE [- 19 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599152)

Student Portal [- 19 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599153)

Institution Portal [- 21 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599154)

WEBSITE APPLICATION TESTING [- 22 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599155)

REFERENCES [- 23 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599155)

4. APPENDIX [- 24 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599156)

web application source code [- 24 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599156)

Clock.html [- 24 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599157)

dbConn.php [- 26 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599160)

Index.html [- 26 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

Student portal [- 28 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599162)

signup.html [- 28 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

connect.php [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

login.html [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

login.php [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

dashboard.html [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

application.php [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

optimize.php [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

courses.php [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

institution portal [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599163)

loginin.html [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

loginin.php [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

dashboardin.php [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

submit.php [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

database files [- 33 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599164)

weights.sql. [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

courses.sql [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

criteria.sql [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

units.sql [- 31 -](file:///E:\School\4\PROJECT\Samples\System%20Documentation.docx#_Toc63599161)

# Project proposal

## ABSTRACT

Our system, BetterUni works like KUCCPS which is used to select university courses, except that it will analyse the individual grades of the candidates, their aggregate cluster points and then run that data through an algorithm that can advise the candidate what courses to take. It is then going to provide the users with an aggregate list of the units in each course that the candidate qualifies for. We will take it further by building another algorithm to analyse the hardness level of each unit in each course that the candidate qualifies for. Therefore, there will be a list of units in that course, hardness level, the workload in terms of projects and the success rate. If the candidate needs further help, the system will be able to link them with an academic counsellor for better one on one human assistance.

**BACKGROUND/INTRODUCTION**

We observed that most students who clear form four and are anticipating to join campus, colleges and other higher learning institutions have no clear way of navigating around suitable courses for their grade. This is because they have no idea what awaits them two or three years into the course. Our younger siblings just cleared high school and all they had with them are stereotypes concerning different renowned courses and looked down on others because they seemed doable. Safe to say we also had the same views, which has led to most of our colleagues dropping out mid-course because they had no prior information concerning the meat of the courses at hand. Very few people are able to adapt as they go, so this system should give a feel of what to expect years into the course of choice, as per your grades and preference.

**PROBLEM STATEMENT**

Over the years, as the education curriculum evolved and devolved with many more courses being add and scrubbed from the academic curriculum, the average high school candidate ready to join university has tons of options, in terms of the course they would like to take at university, put Infront of them. Having many options can be a great thing when you know what you want but if you don't, it almost always becomes confusing. It becomes an anxious task to carry out and sometimes makes things worse. Even then, when a candidate knows what they want to pursue in university, this might be guided by a career path, it is a major plus for the said candidate to know what awaits them in the course they select, have an inkling of what is required of them, how many years it'll take to complete the course, material and skills needed to excel in the course and possible career paths that might follow after the course. This is one of the shortcomings experienced by the current higher education placement system/service, KUCCPS. Not having such vital information about the courses candidates select has had an impact on less students willing joining university, it has seen an increase in number of universities drop out where students drop out after a year or two of school, it's affected student's mental health and has even had an impact in the less and less individuals pursuing post graduate courses eg: masters and PhD. This is what BetterUni seeks to set right.

The computational problem we're trying to fix here is, Asking if I'm a student, can I create a machine learning system that can assist me predict which courses to take? What means will I use to search for data. Will the algorithms be alongside enforced learning? Supervised learning or forced learning?

**JUSTIFICATION**

The Higher Education Placement system in Kenya, KUCCPS should give the forthcoming candidates very good interactive decision support system that aids the candidate in their course decision. Whether the candidate is after a degree, diploma or certificate, with our system, the candidate will able to choose their desired course after the evaluation of their high school grades. BetterUni will run the candidates aggregate/cluster points against an algorithm which will then filter out and present the candidate with a list of possible courses, and institutions, they qualify for. Based on the above provided details, the algorithm will also evaluate the aggregate subject grades (e.g., Math – B+. English A-, Chemistry C…) against the available course units (e.g., Advanced Mathematics, Calculus 1, Molecular Chemistry…) to predict the course’s hardness level and candidate’s success rate in the course. This will save the candidate time on the course exploration rather going on all courses he/she will have the courses at hand. The system will also offer samples of notes, past papers, cats and assignments of each course unit, hence prepares the candidate for the course their want to pursue. The goal of the above defined decision support system is to help the students understand the success factor of their course based on their high school grades before making the decision for their higher education.

**LITERATURE RELEVANT TO YOUR PROPOSAL**

[1] World Bank’s Report on Higher Education Performance in Kenya. Improving-Higher-Education-Performance-in-Kenya-A-Policy-Report.pdf. Report dated 21 Aug 2019

[2] Ndung’u, Karanja & Obae, Rose. (2020). Effects of Career Placement by KUCCPS among the Undergraduate Students in Public Universities in Kiambu County, Kenya. International Journal of Research and Innovation in Social Science. 04. 323-329. 10.47772/IJRISS.2020.41216.

[3] Owiti, Geoffrey. (2019). A UTILITARIAN APPROACH TO ANALYSIS OF EDUCATION IN KENYAN PUBLIC UNIVERSITIES.

[4] Maureen, Adhiambo. (2021). Career aspirations and decision-making self-efficacy: Secondary School Students assessment based on KCSE exams in Kenya. Educational Research and Reviews. 16. 104-108. 10.5897/ERR2021.4142.

**RESEARCH METHODS AND DESIGN**

Our main research goal is understanding the working and flaws of the current higher education placement system/service before and after a candidate applies for a course. We will want to gain this data from the placement service website, high school candidates that are ready to join university, university students and lecturers. We will use various qualitative and quantitative research methods. We will employ one on one participant interviews to gain a review of the current system, the problems the participants have faced, their experiences in the placement process and the courses they are currently involved in. This would provide a first-person view of current systems and is also a way to interact with the potential system users and enquire about challenges with the current system and understand their thoughts about the system fully. This would be a great starting point on what features the system users would expect from a new system.

Participants will also be assessed through a questionnaire which would yield data to back the problem statement. The questionnaire will be based on questions such as how confident the participants are or were when selecting a higher education course, how well informed they are or were before making a decision and if they would appreciate a middle man system that will fill in the gap that the current placement service does not carter for. This would form a basis for a research paper on the topic and the subsequent system to be developed and to deduce some of the challenges we are likely to face along the way.

**METHODOLOGY**

­

Learning PHP and MySQL

Candidate, student & lecturers Interviews

Serving Questionnaires

Testing, Debugging, Security Compliance

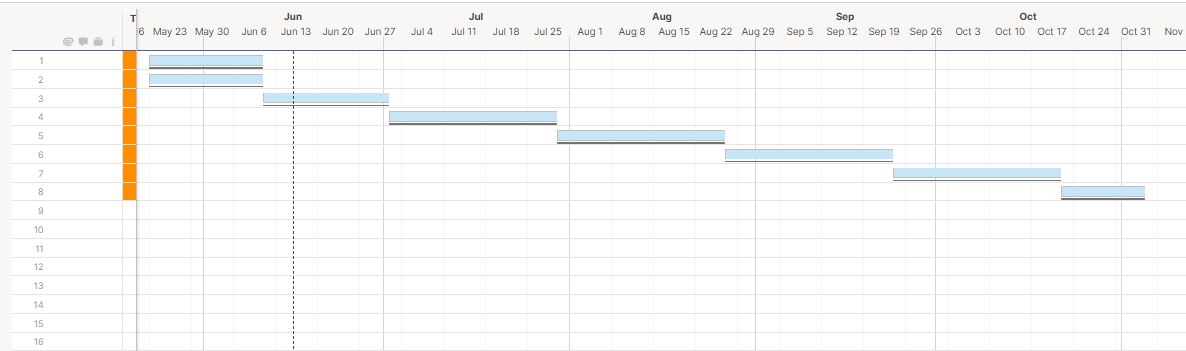
Building the website

Preliminary Investigation

Going through Online past record of reports

**SCHEDULE**

|  |  |  |  |
| --- | --- | --- | --- |
| **TASK** | **TASK DESCRIPTION** | **DURATION** | **PREDECESSOR** |
| A | Preliminary Investigation | 3 weeks | - |
| B | Prerequisite Research | 3 weeks | - |
| C | Study of existing systems | 3 weeks | B |
| D | Objective’s specification | 4 weeks | C |
| E | System Design | 4 weeks | D |
| F | Construction | 4 weeks | E |
| G | Implementation, Testing and Debugging | 4 weeks | E |
| H | Final Documentation | 2 weeks | G |



**BUDGET**

|  |  |  |  |
| --- | --- | --- | --- |
| **BUDGET** | **QUANTITY** | **UNIT PRICE** | **COST PRICE** |
| Printing questionnaires | 100 | 5 | 500 |
| Website hosting |  | 5000 | 5000 |
| Miscellaneous (Transport, Lunch etc.) |  |  | 3000 |
| **TOTAL (Ksh.)** | | | **8500** |

**CONCLUSION**

BetterUni would generally make course selection and the hassle that comes with it easier. Students would pick courses that they prefer whilst having an in-depth knowledge of what exactly they are getting themselves into in terms of units, expectations, workload, time and future career paths. We believe this system will bring about benefits like having more students interested in enrolling into various higher learning institutions, less drop-out rates mid studies, more successful graduates and an overall boost in choosing the right course.

# System Design and Analysis

## SYSTEM USE CASES

## APPLICATION PRODUCT

The user logs on to the website to use the service.

**ASSUMPTIONS MADE**

* All courses share the same units across different universities.
* The students have put 100% effort in the study course.
* The student(s) do not know what course to choose for university according to their KCSE Grade

**DATABASE SCHEMES**

* The data for candidates is exported from the KNEC offices via the Management Portal.
* The data for courses and unit is feed into the system by the University Portal.

**WEBSITE ACCESS**

The users visit the website via a link on any web browser.

**SYSTEM REGISTRATION**

The users of the system must have an individual portal.

* For the candidates they register by giving their index number and the year they did their KCSE Exam and setting a password.
* For the different universities the system receives the courses information from the institutions and sends back the login credentials.
* The management portal (Administrator) is set to be the back-end access for the website.

**SYSTEM ACCESS**

To access the web application system.

* The user, selects their respective portal button i.e., “Student” & “Institution” portal.
* The user, on the system portal login page, enters their username and password.

**PORTAL FUNCTIONS**

To the different users, the portals have different functionalities respectively.

1. **The Institution Portal**

Upon, login the user is met by the home page of the portal which has the data entry method.

* The user, inputs the university course data in the system database.
* The user, gives course guideline information from the university to the system management team.
* It is then up to the institution admin and system admin to ensure the database is up to date with updated course information/details.

1. **The Student Portal**

Upon, login the user is met by the home page of the portal which has the candidate information.

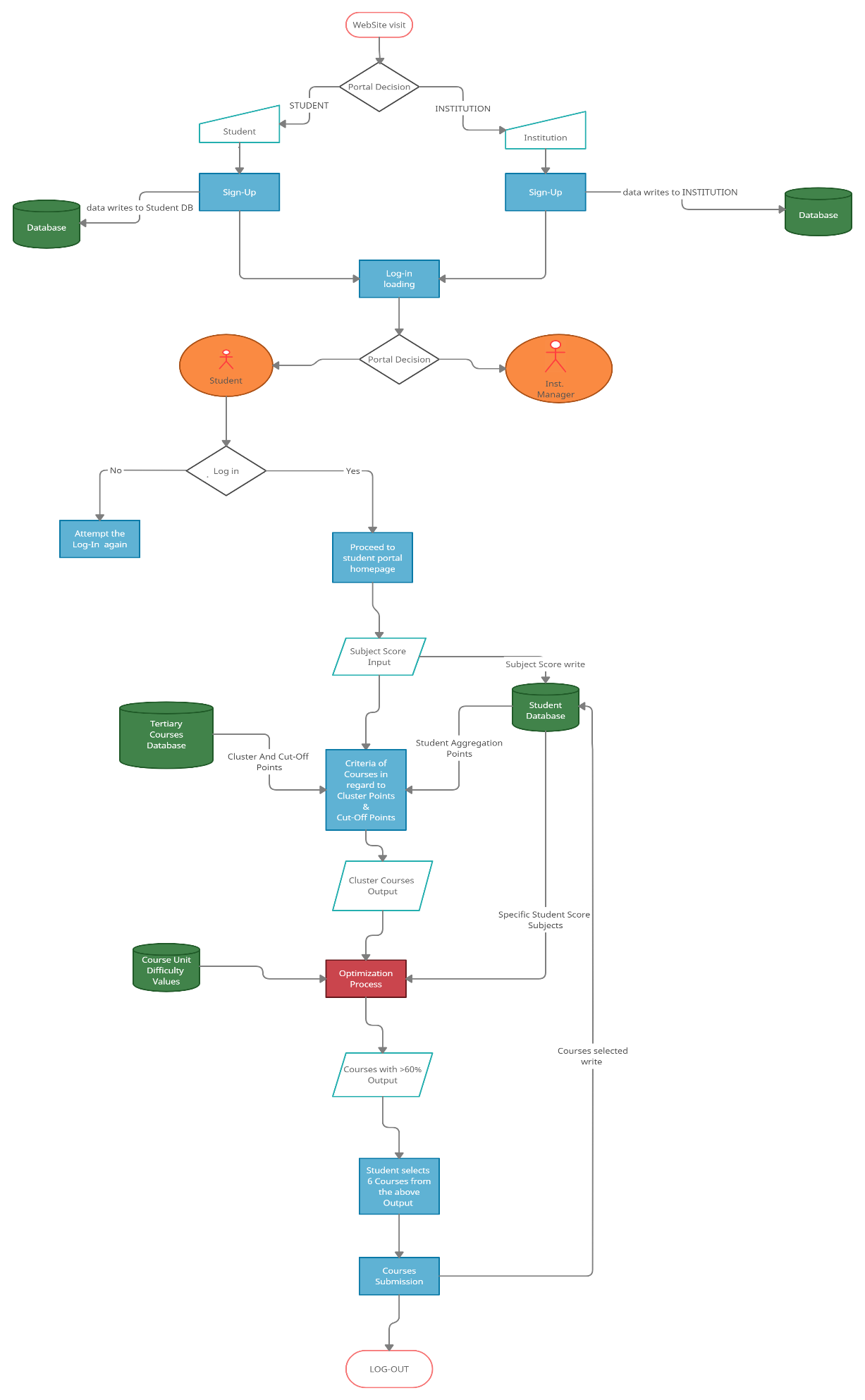
To create a course list, course difficulty:

* The user, enters the subject scores and submits them on dashboard.
* The user, presses the Revision button, which initiates the criteria run.
* The system, first analyses the candidate input results to prepare for optimization.
* The system, scans for the Key Units of each of the Programmes displayed on the Revision page.

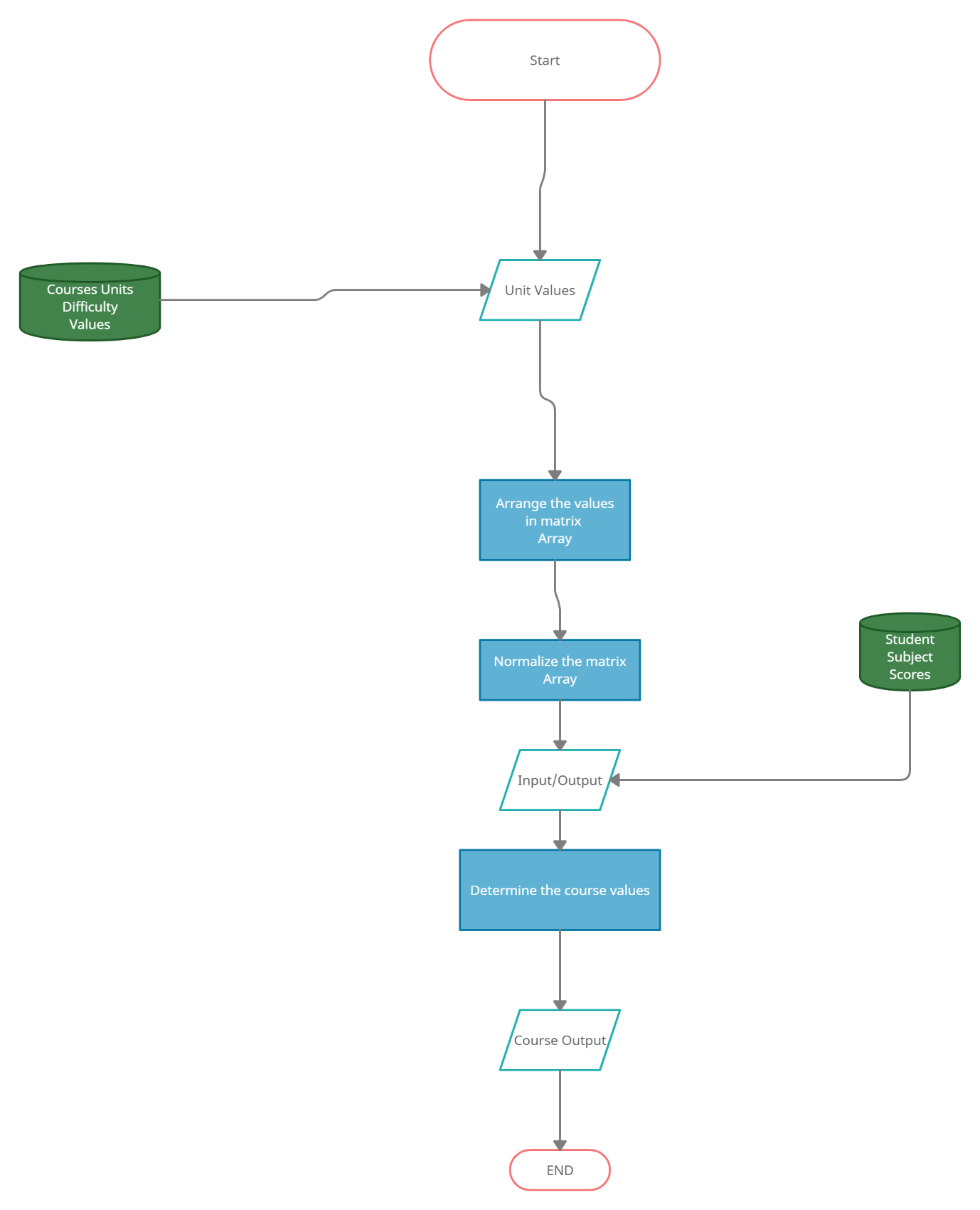
To determine course success rate:

* The system, reads the Key Units difficulty values and forwards them to the optimization model.
* The system, calculates the Key Units difficulty values averages in a matrix form.
* The system, optimizes the Key Units value in reference to the candidate score of specific subjects to predict the success rate.
* The system, returns back the courses with the highest optimization value.
* The system, scans for the Key Units of the Programme input from the Revision page.
* the candidate has to note down the Programmes codes for easy reference when applying.
* The user, settles down to the top courses that have the highest optimization values.

**SYSTEM DIAGRAM/ FLOWCHART**



**SYSTEM OPTIMIZATION MODEL**



## SYSTEM REQUIREMENTS

The following table lists the minimum and recommended hardware requirements for the web application.

| **WEB APPLICATION HARDWARE REQUIREMENTS** | | |
| --- | --- | --- |
| **Component** | **Minimum** | **Recommended** |
| Processor | 1.9 gigahertz (GHz) x86- or x64-bit dual core processor with SSE2 instruction set | 3.3 gigahertz (GHz) or faster 64-bit dual core processor with SSE2 instruction set |
| Memory | 2-GB RAM | 4-GB RAM or more |
| Display | Super VGA with a resolution of 1024 x 768 | Super VGA with a resolution of 1024 x 768 |

Running model-driven apps on a computer that has less than the recommended requirements may result in inadequate performance. Additionally, satisfactory performance may be experienced running systems that use a different hardware configuration than those published here—for example, a system with a modern quad-core processor, lower clock speed, and more RAM.

**Network requirements**

Model-driven apps are designed to work best over networks that have the following elements:

* Bandwidth greater than 50 KBps (400 kbps)
* Latency under 150 ms

Notice that these values are recommendations and don’t guarantee satisfactory performance. The recommended values are based on systems using out-of-the box forms that aren’t customized.

# SYSTEM implementation & testing

## development

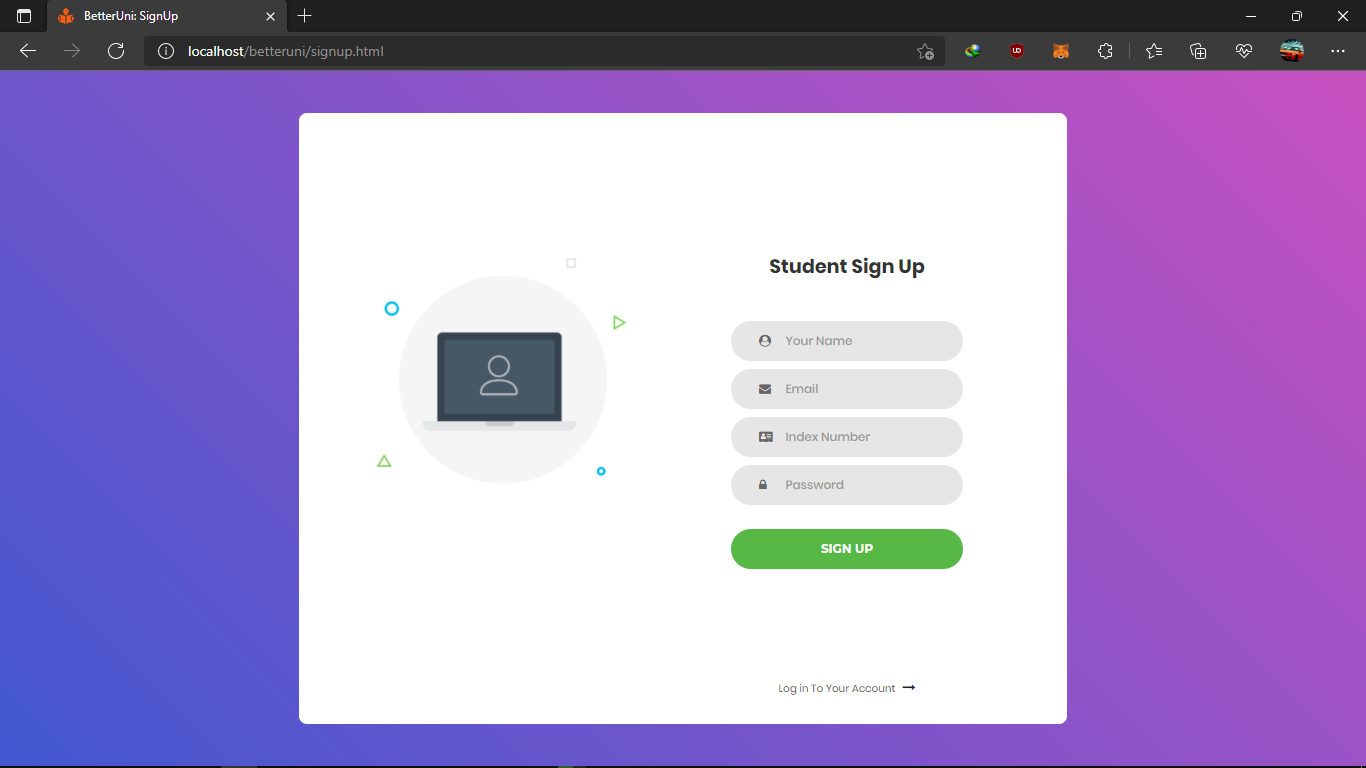
### **WEBSITE APPLICATION IMPLEMENTATION**

For building the web application, we used the HTML for Front-End in conjunction with the PHP for Back-End. The database tool used is MySQL database server. We have used the Multi-Objective Optimization based on Ratio Analysis (MOORA) optimization algorithm. The development of the system was test-driven as test cases were developed and run before development of the product. Unit tests were written for the main features of the system i.e., the Student Sign-Up and Log-in page, the Dashboard Input page and for the optimization recommendation page that runs the optimization algorithm in background.

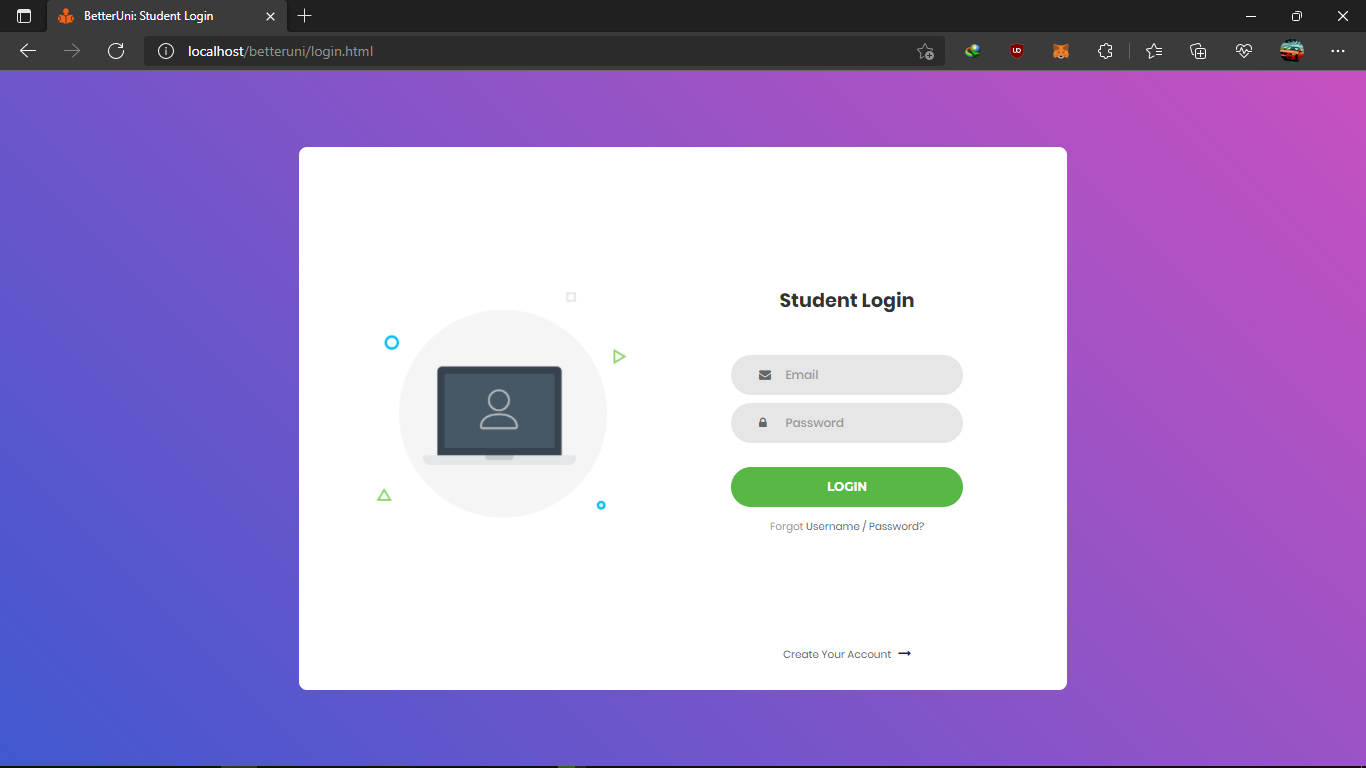
**USER-INTERFACE**

**Student Portal.**

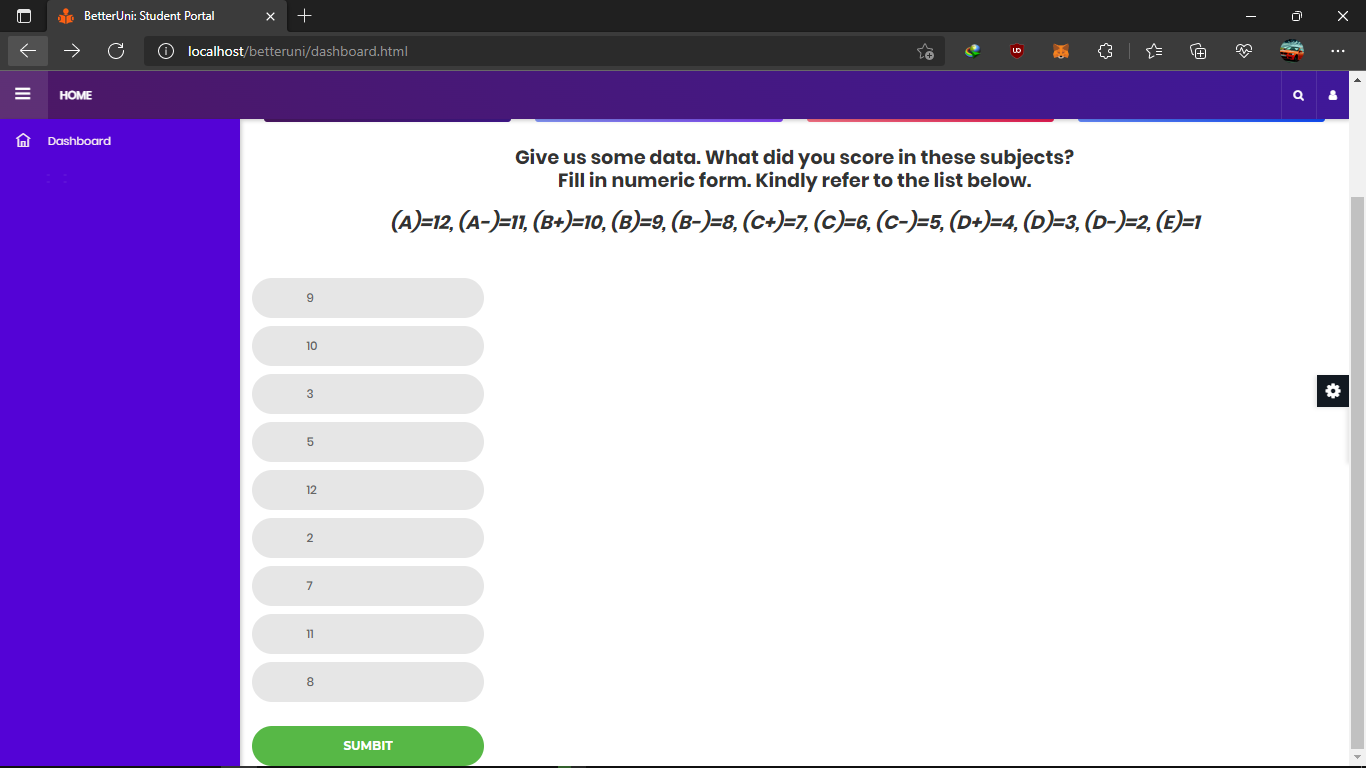
The web application has two main interfaces, the dashboard page and the optimization page. We went for a minimal and user-friendly interface design with the buttons having explanatory names to describe their expected functionality. For the proof-of-concept implementation, we have used the “SUBMIT” button to start the optimization process. In a later version of the application, this can be redesigned to get rid of the buttons and optimization can be started automatically after candidate score is entered.



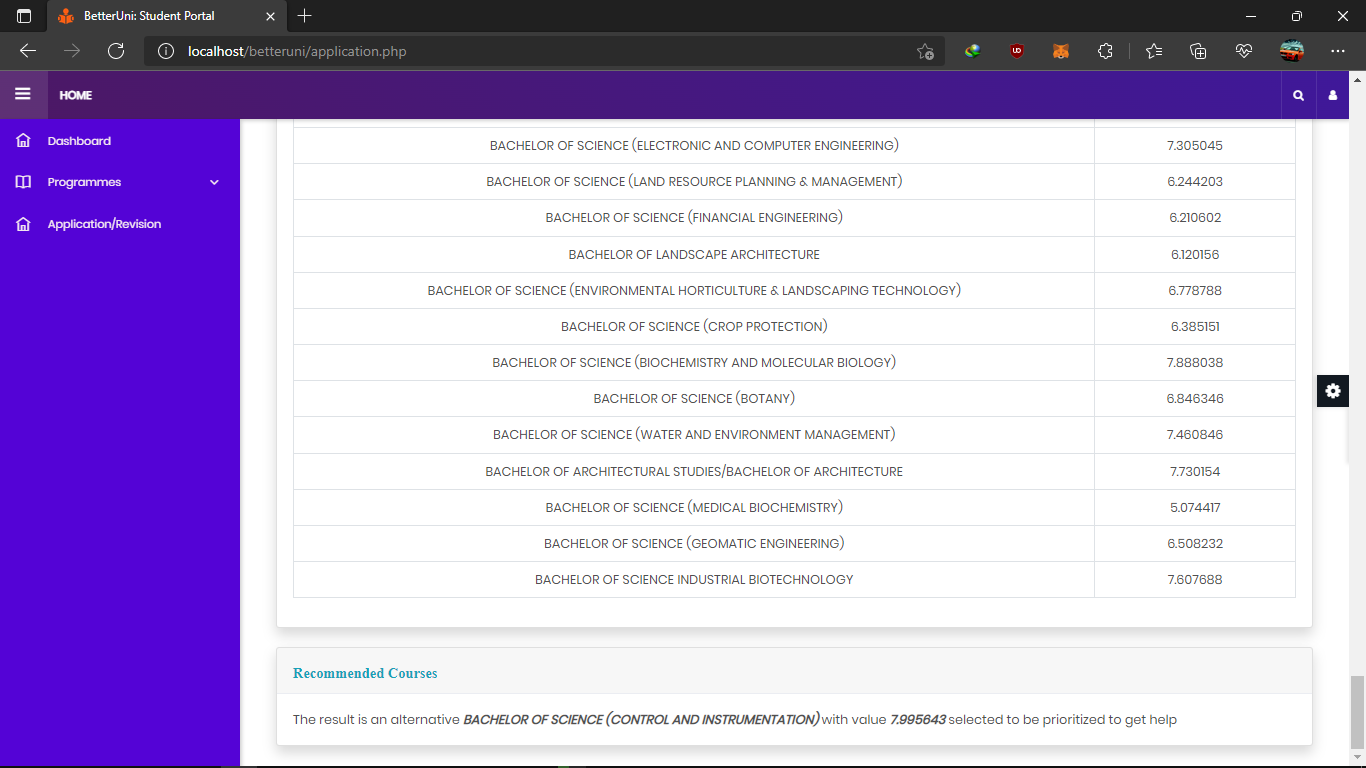
Student Sign-Up Page



Student Log-in Page



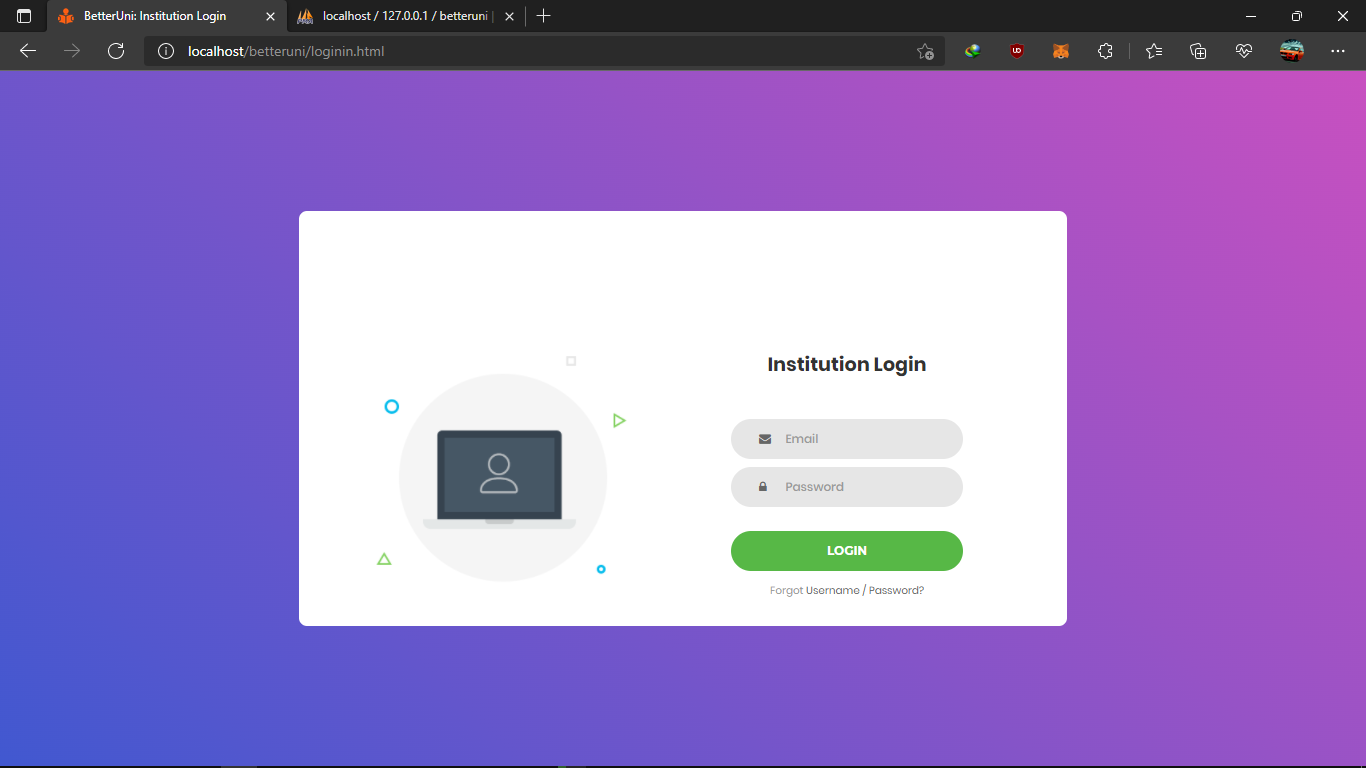
Dashboard Page (Subject Score Input)



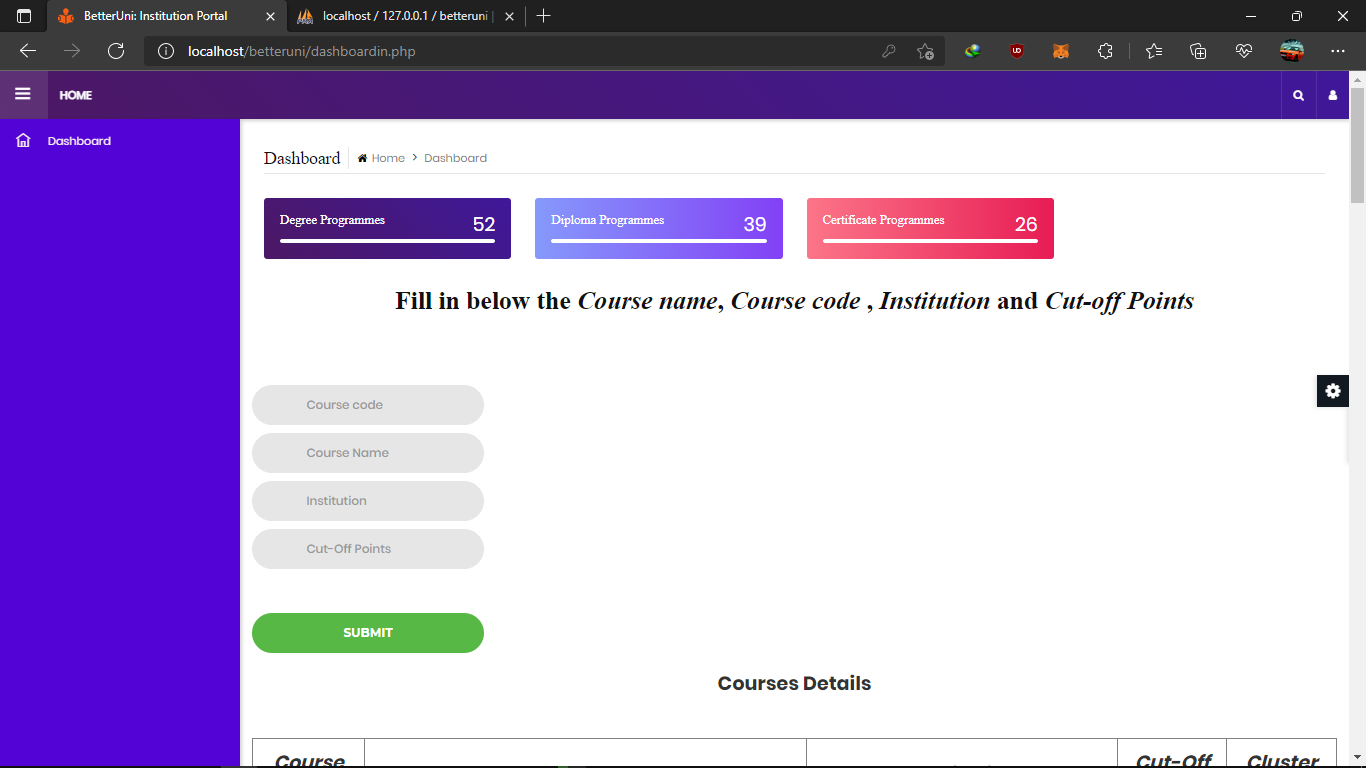
Recommendation Page

**Institution Portal.**

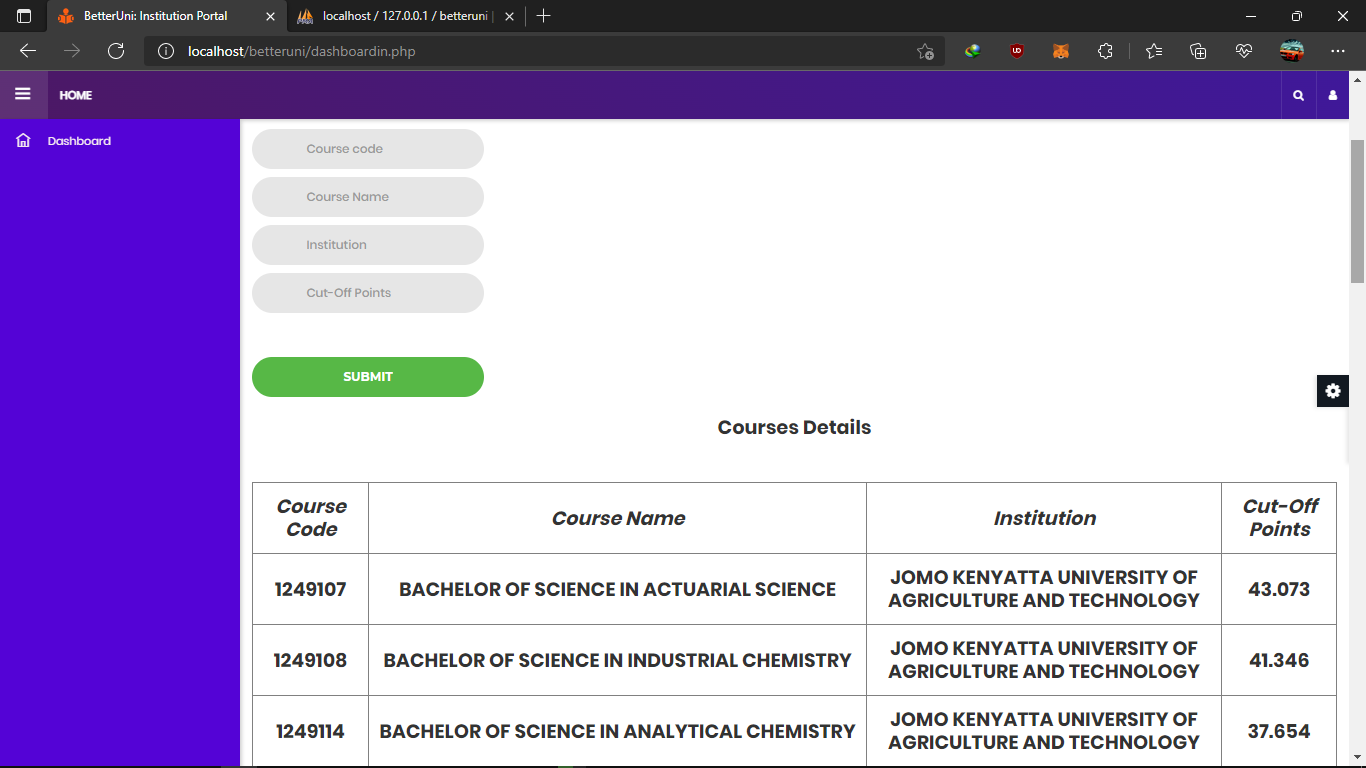
The web application also includes an institution portal used to submit the courses and data associated to the specific course. The user has to be given credentials from the system admin to ensure no unauthorised sign-up to the institution portal.



Institution Log-in Page



Course Submission Page



Sample of courses after submission

**WEB APPLICATION TESTING**

We tested our system using some premeditated data scores and some obtained from online pdf attached to a certain school. This made sure that our system worked on different types of datasets given to it for it to optimize. For each set of data, the system would give out a optimization value tied to a specific course title that is displayed in the recommended courses output form (as shown in Recommendation Page image).

**REFERENCES**

[1] Charo Ruth Karimi; Bassett Roberta Malee; Weaver Jason Allen; Salmi Jamil; Bersin Joanna Halley; Okiya Stephen Shisoka; Zaafrane,Hafedh.2019. *Improving Higher Education Performance in Kenya: A Policy Report (English).*Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/831821566966279688/Improving-Higher-Education-Performance-in-Kenya-A-Policy-Report>

[2] Ndung’u, Karanja & Obae, Rose. (2020). Effects of Career Placement by KUCCPS among the Undergraduate Students in Public Universities in Kiambu County, Kenya. International Journal of Research and Innovation in Social Science. 04. 323-329. 10.47772/IJRISS.2020.41216. <https://www.researchgate.net/publication/348455058_Effects_of_Career_Placement_by_KUCCPS_among_the_Undergraduate_Students_in_Public_Universities_in_Kiambu_County_Kenya?_sg=USk0yg7MAgqk3y5jaeLv5nfgHHu9EQ6vze-69iUGJIMJ5k-3GsvSnmtN9kTHuKUjQ-lnjrxoiOFt-8Y>

[3] Owiti, Geoffrey. (2019). A UTILITARIAN APPROACH TO ANALYSIS OF EDUCATION IN KENYAN PUBLIC UNIVERSITIES. <https://www.researchgate.net/publication/337050264_A_UTILITARIAN_APPROACH_TO_ANALYSIS_OF_EDUCATION_IN_KENYAN_PUBLIC_UNIVERSITIES?_sg=dsTC6zkxyMINaZYVAN0TkuKnK2gYBwVcBWElRksIS_ofj2cPPw3rLtVyJe-Ko4i2orJylFaAPplv6D8>

[4] Maureen, Adhiambo. (2021). Career aspirations and decision-making self efficacy: Secondary School Students assessment based on KCSE exams in Kenya. Educational Research and Reviews. 16. 104-108. 10.5897/ERR2021.4142. <https://www.researchgate.net/publication/351723466_Career_aspirations_and_decision_making_self_efficacy_Secondary_School_Studentsassessment_based_on_KCSE_exams_in_Kenya?_sg=mgqF6-odR0fhm2ZMVkbNaxZyLwShX3wtwBByd2gk5F9dOJ6qBWqaINgjPDceef7B3WcK1JX1-IXlK4g>

[5] 4 th INTERNATIONAL SEMINAR: RESEARCH FOR SCIENCE, TECHNOLOGY AND CULTURE (IRSTC 2017). Student Admission Assesment using Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA). Mesran, Rivalri Kristianto Hondro, Muhammad Syahrizal , Andysah Putera Utama Siahaan , Robbi Rahim , Suginam

[6] An optimization‐based decision support system for students' personalized long‐term course planning RESEARCH ARTICLE. Accepted: 19 June 2020. DOI: 10.1002/cae.22299. Correspondence: Majid Shakhsi‐Niaei, Department of Industrial Engineering, College of Engineering, Yazd University, Safayeh, Yazd 8915818411, Iran.

[7] Predicting Student Performance by Using Data Mining Methods for Classification RESEARCH ARTICLE (CYBERNETICS AND INFORMATION TECHNOLOGIES). Accepted: 09 June 2016. DOI: 10.2478/cait-2013-0006. Correspondence: Dorina kabakchieva, Sofia University “St. Kl.Ohridski”.

[8]. Decision Support System METHOD [cahyadsn.phpindonesia.id](http://cahyadsn.phpindonesia.id/extra/moora.php)

# appendix A

## WEB APPLICATION source code

**clock.html**

This is a system clock set to run in conjunction with the host machine time.

<!DOCTYPE HTML>

<html>

<head>

<meta http-equiv="Content-Type" content="text/html; charset=utf-8">

<title></title>

<style type="text/css">

body{

     font:bold 7px Arial, Helvetica, sans-serif;

     margin:0;

     padding:0;

     min-width:960px;

     color:#bbbbbb;

}

@font-face {

    font-family: 'BebasNeueRegular';

    src: url('js/BebasNeue-webfont.eot');

    src: url('js/BebasNeue-webfont.eot?#iefix') format('embedded-opentype'),

         url('js/BebasNeue-webfont.woff') format('woff'),

         url('js/BebasNeue-webfont.ttf') format('truetype'),

         url('js/BebasNeue-webfont.svg#BebasNeueRegular') format('svg');

    font-weight: normal;

    font-style: normal;

}

.container {width: 100%; overflow: hidden;}

.clock {width:100%; color:#fff; }

#Date { font-family: Helvetica, sans-serif; font-size:16px;  }

ul { width:800px; padding:0px; list-style:none;}

ul li { display:inline; font-size:3em; font-family:'BebasNeueRegular', Arial, Helvetica, sans-serif;padding-left: 2px; }

#point { position:relative; -moz-animation:mymove 1s ease infinite; -webkit-animation:mymove 1s ease infinite; padding-right:5px; padding-left: 5px;}

@-webkit-keyframes mymove

{

0% {opacity:1.0; }

50% {opacity:0;  }

100% {opacity:1.0; }

}

@-moz-keyframes mymove

{

0% {opacity:1.0;}

50% {opacity:0; }

100% {opacity:1.0; }

}

</style>

<script type="text/javascript" src="http://code.jquery.com/jquery-1.6.4.min.js"></script>

<script type="text/javascript">

$(document).ready(function() {

// Create two variable with the names of the months and days in an array

var monthNames = [ "January", "February", "March", "April", "May", "June", "July", "August", "September", "October", "November", "December" ];

// Create a newDate() object

var newDate = new Date();

// Extract the current date from Date object

newDate.setDate(newDate.getDate());

// Output the day, date, month and year

$('#Date').html(newDate.getDate() + ' ' + monthNames[newDate.getMonth()] + ' ' + newDate.getFullYear());

setInterval( function() {

    // Create a newDate() object and extract the seconds of the current time on the visitor's

    var seconds = new Date().getSeconds();

    // Add a leading zero to seconds value

    $("#sec").html(( seconds < 10 ? "0" : "" ) + seconds);

    },1000);

setInterval( function() {

    // Create a newDate() object and extract the minutes of the current time on the visitor's

    var minutes = new Date().getMinutes();

    // Add a leading zero to the minutes value

    $("#min").html(( minutes < 10 ? "0" : "" ) + minutes);

    },1000);

setInterval( function() {

    // Create a newDate() object and extract the hours of the current time on the visitor's

    var hours = new Date().getHours();

    // Add a leading zero to the hours value

    $("#hours").html(( hours < 10 ? "0" : "" ) + hours);

    }, 1000);

});

</script>

</head>

<body>

<div class="container">

<div class="clock">

<div id="Date"></div>

<ul>

    <li id="hours"> </li>

    <li id="point">:</li>

    <li id="min"> </li>

    <li id="point">:</li>

    <li id="sec"> </li>

</ul>

</div>

</div>

</body>

</html>

**dbConn.php**

This is the php code for connecting to the database.

<?php

$db = mysqli\_connect("localhost","root","","betteruni");

if(!$db)

{

    die("Connection failed: " . mysqli\_connect\_error());

}

?>

**Index.html**

Landing page for the web Application where the user chooses the portal of their category.

<!DOCTYPE html>

<html lang="en">

    <head>

        <meta charset="utf-8">

        <title>BetterUni</title>

        <meta name="keywords" content="">

        <meta name="description" content="">

        <meta name="author" content="templatemo">

        <meta http-equiv="X-UA-Compatible" content="IE=Edge">

        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />

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

        <link rel="icon" href="assets/images/favicon.ico" type="image/x-icon" />

        <link rel="stylesheet" type="text/css" href="vendor/bootstrap/css/bootstrap.min.css">

        <link rel="stylesheet" type="text/css" href="fonts/font-awesome-4.7.0/css/font-awesome.min.css">

        <link rel="stylesheet" type="text/css" href="vendor/animate/animate.css">

        <link rel="stylesheet" type="text/css" href="vendor/css-hamburgers/hamburgers.min.css">

        <link rel="stylesheet" type="text/css" href="vendor/select2/select2.min.css">

        <link rel="stylesheet" type="text/css" href="css/util.css">

        <link rel="stylesheet" type="text/css" href="css/main.css">

    </head>

    <body>

        <div class="limiter">

            <div class="container-login100">

                <div class="wrap-login100">

                    <div class="login100-pic js-tilt" data-tilt>

                        <img src="images/img-01.png" alt="IMG">

                    </div>

                    <form class="login100-form validate-form">

                        <div class="col-md-2">

                        </div>

                        <div>

                            <span class="login100-form-title">

                                <center>

                                <p><h2>Welcome</h2></p>

                                <p><h3> to </h3></p>

                                <h1 class="rotate"> BetterUni </h1>

                                </center>

                            </span>

                        </div>

                        <div>

                            <span class="login100-form-title">

                                <p>Select your appropriate portal</p>

                            </span>

                        </div>

                        <div class="container-login100-form-btn">

                            <button class="login100-form-btn">

                                <a href="signup.html" class="btn btn-default smoothScroll wow fadeInUp" data-wow-delay="1s">Student Portal</a>

                            </button>

                        </div>

                        <pre></pre>

                        <div>

                            <button class="login100-form-btn">

                                <a href="loginin.html" class="btn btn-default smoothScroll wow fadeInUp" data-wow-delay="1s">Institution Portal</a>

                            </button>

                        </div>

                        <div class="col-md-2">

                        </div>

                    </form>

                </div>

            </div>

        </div>

        <script src="vendor/jquery/jquery-3.2.1.min.js"></script>

        <script src="vendor/bootstrap/js/popper.js"></script>

        <script src="vendor/bootstrap/js/bootstrap.min.js"></script>

        <script src="vendor/select2/select2.min.js"></script>

        <script src="vendor/tilt/tilt.jquery.min.js"></script>s

    <script >

        $('.js-tilt').tilt({

            scale: 1.1

        })

        </script>

        <script src="js/main.js"></script>

    </body>

</html>

**STUDENT PORTAL**

**Sign-Up.html**

This is the sign-up page for the student to register in the system.

<!DOCTYPE html>

<html lang="en">

<head>

    <title>BetterUni: SignUp</title>

    <meta charset="UTF-8">

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

    <link rel="icon" href="assets/images/favicon.ico" type="image/x-icon" />

    <link rel="stylesheet" type="text/css" href="vendor/bootstrap/css/bootstrap.min.css">

    <link rel="stylesheet" type="text/css" href="fonts/font-awesome-4.7.0/css/font-awesome.min.css">

    <link rel="stylesheet" type="text/css" href="vendor/animate/animate.css">

    <link rel="stylesheet" type="text/css" href="vendor/css-hamburgers/hamburgers.min.css">

    <link rel="stylesheet" type="text/css" href="vendor/select2/select2.min.css">

    <link rel="stylesheet" type="text/css" href="css/util.css">

    <link rel="stylesheet" type="text/css" href="css/main.css">

</head>

<body>

    <div class="limiter">

        <div class="container-login100">

            <div class="wrap-login100">

                <div class="login100-pic js-tilt" data-tilt>

                    <img src="images/img-01.png" alt="IMG">

                </div>

                <form class="login100-form validate-form"  action="connect.php" method="post">

                    <span class="login100-form-title">

                        Student Sign Up

                    </span>

                    <div class="wrap-input100 validate-input" data-validate = "Please enter your name: ex. John Doe">

                        <input class="input100" type="text" name="name" id="name" placeholder="Your Name">

                        <span class="focus-input100"></span>

                        <span class="symbol-input100">

                            <i class="fa fa-user-circle" aria-hidden="true"></i>

                        </span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "Valid email is required: ex. johndoe@abc.xyz">

                        <input class="input100" type="text" name="email" id="email" placeholder="Email">

                        <span class="focus-input100"></span>

                        <span class="symbol-input100">

                            <i class="fa fa-envelope" aria-hidden="true"></i>

                        </span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "enter your index number: ex. 36601234567">

                        <input class="input100" type="number" name="indexnumber" required pattern="[0-9]{11}" id="indexnumber" placeholder="Index Number">

                        <span class="focus-input100"></span>

                        <span class="symbol-input100">

                            <i class="fa fa-address-card" aria-hidden="true"></i>

                        </span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "Password is required">

                        <input class="input100" type="password" name="password" id="password" placeholder="Password">

                        <span class="focus-input100"></span>

                        <span class="symbol-input100">

                            <i class="fa fa-lock" aria-hidden="true"></i>

                        </span>

                    </div>

                    <div class="container-login100-form-btn">

                        <button class="login100-form-btn" name="signup">

                            Sign Up

                        </button>

                    </div>

                    <div class="text-center p-t-136">

                        <a class="txt2" href="login.html">Log in To Your Account</a>

                        <i class="fa fa-long-arrow-right m-l-5" aria-hidden="true"></i>

                    </div>

                </form>

            </div>

        </div>

    </div>

    <script src="vendor/jquery/jquery-3.2.1.min.js"></script>

    <script src="vendor/bootstrap/js/popper.js"></script>

    <script src="vendor/bootstrap/js/bootstrap.min.js"></script>

    <script src="vendor/select2/select2.min.js"></script>

    <script src="vendor/tilt/tilt.jquery.min.js"></script>

    <script >

        $('.js-tilt').tilt({

            scale: 1.1

        })

    </script>

    <script src="js/main.js"></script>

</body>

</html>

**connect.php**

This is the php code for inserting the student data into the database.

<?php

  require\_once "dbConn.php";

    if (isset($\_POST['signup'])) {

        $name = mysqli\_real\_escape\_string($db, $\_POST['name']);

        $email = mysqli\_real\_escape\_string($db, $\_POST['email']);

        $indexnumber = mysqli\_real\_escape\_string($db, $\_POST['indexnumber']);

        $password = mysqli\_real\_escape\_string($db, $\_POST['password']);

        if (!preg\_match("/^[a-zA-Z ]+$/",$name)) {

            $name\_error = "Name must contain only alphabets and space";

        }

        if(!filter\_var($email,FILTER\_VALIDATE\_EMAIL)) {

            $email\_error = "Please Enter Valid Email ID";

        }

        if(strlen($password) < 6) {

            $password\_error = "Password must be minimum of 6 characters";

        }

        if(strlen($indexnumber) < 11) {

            $indexnumber = "Mobile number must be minimum of 11 characters";

        }

        if (!$error) {

            if(mysqli\_query($db, "INSERT INTO student(name, email, indexnumber ,password) VALUES('" . $name . "', '" . $email . "', '" . $indexnumber . "', '" . md5($password) . "')")) {

             header("location: signup.html");

             exit();

            } else {

               echo "Error: " . $sql . "" . mysqli\_error($db);

            }

        }

        mysqli\_close($db);

    }

?>

**login.html**

Log-In page for the student to login

<!DOCTYPE html>

<html lang="en">

<head>

    <title>BetterUni: Student Login</title>

    <meta charset="UTF-8">

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

    <link rel="icon" href="assets/images/favicon.ico" type="image/x-icon" />

    <link rel="stylesheet" type="text/css" href="vendor/bootstrap/css/bootstrap.min.css">

    <link rel="stylesheet" type="text/css" href="fonts/font-awesome-4.7.0/css/font-awesome.min.css">

    <link rel="stylesheet" type="text/css" href="vendor/animate/animate.css">

    <link rel="stylesheet" type="text/css" href="vendor/css-hamburgers/hamburgers.min.css">

    <link rel="stylesheet" type="text/css" href="vendor/select2/select2.min.css">

    <link rel="stylesheet" type="text/css" href="css/util.css">

    <link rel="stylesheet" type="text/css" href="css/main.css">

</head>

<body>

    <div class="limiter">

        <div class="container-login100">

            <div class="wrap-login100">

                <div class="login100-pic js-tilt" data-tilt>

                    <img src="images/img-01.png" alt="IMG">

                </div>

                <form class="login100-form validate-form" action="login.php" method="post">

                    <span class="login100-form-title">

                        Student Login

                    </span>

                    <div class="wrap-input100 validate-input" data-validate = "Valid email is required: ex. johndoe@abc.xyz">

                        <input class="input100" type="text" name="email" id="email" placeholder="Email">

                        <span class="focus-input100"></span>

                        <span class="symbol-input100">

                            <i class="fa fa-envelope" aria-hidden="true"></i>

                        </span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "Password is required">

                        <input class="input100" type="password" name="password" id="password" placeholder="Password">

                        <span class="focus-input100"></span>

                        <span class="symbol-input100">

                            <i class="fa fa-lock" aria-hidden="true"></i>

                        </span>

                    </div>

                    <div class="container-login100-form-btn">

                        <button class="login100-form-btn">

                            Login

                        </button>

                    </div>

                    <div class="text-center p-t-12">

                        <span class="txt1">

                            Forgot

                        </span>

                        <a class="txt2" href="forget-password.html">

                            Username / Password?

                        </a>

                    </div>

                    <div class="text-center p-t-136">

                        <a class="txt2" href="signup.html"> Create Your Account</a>

                        <i class="fa fa-long-arrow-right m-l-5" aria-hidden="true"></i>

                    </div>

                </form>

            </div>

        </div>

    </div>

    <script src="vendor/jquery/jquery-3.2.1.min.js"></script>

    <script src="vendor/bootstrap/js/popper.js"></script>

    <script src="vendor/bootstrap/js/bootstrap.min.js"></script>

    <script src="vendor/select2/select2.min.js"></script>

    <script src="vendor/tilt/tilt.jquery.min.js"></script>

    <script >

        $('.js-tilt').tilt({

            scale: 1.1

        })

    </script>

    <script src="js/main.js"></script>

</body>

</html>

**login.php**

This is the php back-end code that validates and allows the student to login.

<?php

    $email = $\_POST['email'];

    $password = $\_POST['password'];

    //Database Connection//

    $conn = new mysqli('localhost','root','','betteruni');

    if($conn->connect\_error) {

        die('Connection Failed : '.$conn->connect\_error);

    }else {

        $stmt = $conn->prepare("SELECT \* FROM student where email = ?");

        $stmt->bind\_param("s", $email);

        $stmt->execute();

        $stmt\_result = $stmt->get\_result();

        if($stmt\_result->num\_rows > 0 ) {

            $data = $stmt\_result->fetch\_assoc();

            if($data['password'] === md5($password)) {

                echo "<h2>Login Successfully</h2>";

                header("location: dashboard.html");

            }else {

                echo "<h2>Invalid Email or Password</h2>";

            }

        }else {

            echo "<h2>Invalid Email or Password</h2>";

        }

        $stmt->store\_result();

    }

?>

**dashboard,html**

This is page where the candidate fills in their subject score.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="utf-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="keywords" content="" />

    <meta name="author" content="" />

    <meta name="robots" content="" />

    <link rel="icon" href="../error-404.html" type="image/x-icon" />

    <link rel="shortcut icon" type="image/x-icon" href="assets/images/favicon.png" />

    <title>BetterUni: Student Portal </title>

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

    <link rel="stylesheet" type="text/css" href="assets/css/assets.css">

    <link rel="stylesheet" type="text/css" href="assets/vendors/calendar/fullcalendar.css">

    <link rel="stylesheet" type="text/css" href="assets/css/typography.css">

    <link rel="stylesheet" type="text/css" href="assets/css/shortcodes/shortcodes.css">

    <link rel="stylesheet" type="text/css" href="assets/css/style.css">

    <link rel="stylesheet" type="text/css" href="assets/css/dashboard.css">

    <link class="skin" rel="stylesheet" type="text/css" href="assets/css/color/color-1.css">

    <link rel="stylesheet" type="text/css" href="assets/css/assets.css">

    <link rel="stylesheet" type="text/css" href="assets/vendors/calendar/fullcalendar.css">

    <link rel="stylesheet" type="text/css" href="assets/css/typography.css">

    <link rel="stylesheet" type="text/css" href="assets/css/shortcodes/shortcodes.css">

    <link rel="stylesheet" type="text/css" href="assets/css/style.css">

    <link rel="stylesheet" type="text/css" href="assets/css/dashboard.css">

    <link class="skin" rel="stylesheet" type="text/css" href="assets/css/color/color-1.css">

    <link rel="stylesheet" type="text/css" href="css/util.css">

    <link rel="stylesheet" type="text/css" href="css/main.css">

</head>

<body class="ttr-opened-sidebar ttr-pinned-sidebar">

    <!-- header start -->

    <header class="ttr-header">

        <div class="ttr-header-wrapper">

            <!--sidebar menu toggler start -->

            <div class="ttr-toggle-sidebar ttr-material-button">

                <i class="ti-menu ttr-close-icon"></i>

                <i class="ti-close ttr-open-icon"></i>

            </div>

            <!--sidebar menu toggler end -->

            <div class="ttr-header-menu">

                <!-- header left menu start -->

                <ul class="ttr-header-navigation">

                    <li>

                        <a href="dashboard.html" class="ttr-material-button ttr-submenu-toggle">HOME</a>

                    </li>

                </ul>

                <!-- header left menu end -->

            </div>

            <div class="ttr-header-right ttr-with-seperator">

                <!-- header right menu start -->

                <ul class="ttr-header-navigation">

                    <li>

                        <a href="#" class="ttr-material-button ttr-search-toggle"><i class="fa fa-search"></i></a>

                    </li>

                    <li>

                        <a href="#" class="ttr-material-button ttr-submenu-toggle"><i class="fa fa-user" aria-hidden="true"></i></a>

                        <div class="ttr-header-submenu">

                            <ul>

                                <li><a href="user-profile.php">My profile</a></li>

                                <li><a href="basket.php">Applied Courses</a></li>

                                <li><a href="mailbox.html">Messages</a></li>

                                <li><a href="login.html">Logout</a></li>

                            </ul>

                        </div>

                    </li>

                </ul>

                <!-- header right menu end -->

            </div>

            <!--header search panel start -->

            <div class="ttr-search-bar">

                <form class="ttr-search-form">

                    <div class="ttr-search-input-wrapper">

                        <input type="text" name="qq" placeholder="search something..." class="ttr-search-input">

                        <button type="submit" name="search" class="ttr-search-submit"><i class="ti-arrow-right"></i></button>

                    </div>

                    <span class="ttr-search-close ttr-search-toggle">

                        <i class="ti-close"></i>

                    </span>

                </form>

            </div>

            <!--header search panel end -->

        </div>

    </header>

    <!-- header end -->

    <!-- Left sidebar menu start -->

    <div class="ttr-sidebar">

        <div class="ttr-sidebar-wrapper content-scroll">

            <!-- sidebar menu start -->

            <nav class="ttr-sidebar-navi">

                <ul>

                    <li>

                        <a href="dashboard.html" class="ttr-material-button">

                            <span class="ttr-icon"><i class="ti-home"></i></span>

                            <span class="ttr-label">Dashboard</span>

                        </a>

                    </li>

                </ul>

                <ul>

                    <center>

                    <iframe width="200px" height="60px" scrolling="no" src="clock.html"></iframe>

                    </center>

                </ul>

                <!-- sidebar menu end -->

            </nav>

            <!-- sidebar menu end -->

        </div>

    </div>

    <!-- Left sidebar menu end -->

    <!--Main container start -->

    <main class="ttr-wrapper">

        <div class="container-fluid">

            <div class="db-breadcrumb">

                <h4 class="breadcrumb-title">Dashboard</h4>

                <ul class="db-breadcrumb-list">

                    <li><a href="#"><i class="fa fa-home"></i>Home</a></li>

                    <li>Dashboard</li>

                </ul>

            </div>

            <!-- Card -->

            <div class="row">

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg1">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Degree Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats">

                                <span class="counter">90</span>

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg2">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                 Diploma Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats counter">

                                20

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg3">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Certificate Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats counter">

                                70

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg4">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Universities & Colleges

                            </h4>

                            <span class="wc-stats counter">

                                80

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

            </div>

            <!-- Card END -->

            <div class="row">

                <span class="login100-form-title">

                    Give us some data. What did you score in these subjects?<br>

                    Fill in numeric form. Kindly refer to the list below.<br>

                    <pre></pre>

                    <em>

                        (A)=12, (A-)=11, (B+)=10, (B)=9, (B-)=8, (C+)=7, (C)=6, (C-)=5, (D+)=4, (D)=3, (D-)=2, (E)=1

                    </em>

                </span>

                <!--form start here-->

                <form class="login100-form validate-form" action="application.php" method="post">

                    <div class="wrap-input100 validate-input" data-validate = "What was your English Grade?">

                        <input class="input100"  type="number"  name="english" id="english" placeholder="English" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What was your Kiswahili Grade?">

                        <input class="input100" type="number" name="kiswahili" id="kiswahili" placeholder="Kiswahili" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What was your Mathematics Grade?">

                        <input class="input100" type="number" name="mathematics" id="mathematics" placeholder="Mathematics" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What was your Biology Grade?">

                        <input class="input100" type="number" name="biology" id="biology" placeholder="Biology" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What was your Physics Grade?">

                        <input class="input100" type="number" name="physics" id="physics" placeholder="Physics" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What was your Chemistry Grade?">

                        <input class="input100" type="number" name="chemistry" id="chemistry" placeholder="Chemistry" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What was your CRE Grade?">

                        <input class="input100" type="number" name="creire" id="creire" placeholder="CRE/IRE" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What was your Geography/History Grade?">

                        <input class="input100" type="number" name="geohis" id="geohis" placeholder="Geography/History" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What Elective subject did you do?">

                        <input class="input100" type="number" name="elective" id="elective" placeholder="Elective" min="1" max="12">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="container-login100-form-btn">

                        <input class="login100-form-btn" type="submit" name="submit" value="SUMBIT"><br>

                    </div>

                </form>

            </div>

        </div>

    </main>

    <div class="ttr-overlay"></div>

<!-- External JavaScripts -->

    <script src="assets/js/jquery.min.js"></script>

    <script src="assets/vendors/bootstrap/js/popper.min.js"></script>

    <script src="assets/vendors/bootstrap/js/bootstrap.min.js"></script>

    <script src="assets/vendors/bootstrap-select/bootstrap-select.min.js"></script>

    <script src="assets/vendors/bootstrap-touchspin/jquery.bootstrap-touchspin.js"></script>

    <script src="assets/vendors/magnific-popup/magnific-popup.js"></script>

    <script src="assets/vendors/counter/waypoints-min.js"></script>

    <script src="assets/vendors/counter/counterup.min.js"></script>

    <script src="assets/vendors/imagesloaded/imagesloaded.js"></script>

    <script src="assets/vendors/masonry/masonry.js"></script>

    <script src="assets/vendors/masonry/filter.js"></script>

    <script src="assets/vendors/owl-carousel/owl.carousel.js"></script>

    <script src='assets/vendors/scroll/scrollbar.min.js'></script>

    <script src="assets/js/functions.js"></script>

    <script src="assets/vendors/chart/chart.min.js"></script>

    <script src="assets/js/admin.js"></script>

    <script src='assets/vendors/calendar/moment.min.js'></script>

    <script src='assets/vendors/calendar/fullcalendar.js'></script>

    <script src='assets/vendors/switcher/switcher.js'></script>

</body>

</html>

**application.php**

This the page that loads with the optimized values from the optimize back-end process of MOORA optimization.

<?php

if (!empty($\_POST)){

    $english = $\_POST['english'];

    $kiswahili = $\_POST['kiswahili'];

    $mathematics = $\_POST['mathematics'];

    $biology = $\_POST['biology'];

    $chemistry = $\_POST['chemistry'];

    $physics = $\_POST['physics'];

    $creire = $\_POST['creire'];

    $geohis = $\_POST['geohis'];

    $elective = $\_POST['elective'];

    }

$dbhost = 'localhost';

$dbuser = 'root';

$dbpass = '';

$dbname = 'betteruni';

$db = mysqli\_connect($dbhost,$dbuser,$dbpass,$dbname);

//update ENGLISH on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql1 = "UPDATE moo\_kriteria SET bobot='$\_POST[english]' WHERE id\_criteria=1";

if (mysqli\_query($db, $sql1)) {

  } else {

}

//update KISWAHILI on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql2 = "UPDATE moo\_kriteria SET bobot='$\_POST[kiswahili]' WHERE id\_criteria=2";

if (mysqli\_query($db, $sql2)) {

  } else {

}

//update MATHEMATICS on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql3 = "UPDATE moo\_kriteria SET bobot='$\_POST[mathematics]' WHERE id\_criteria=3";

if (mysqli\_query($db, $sql3)) {

  } else {

}

//update BIOLOGY on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql4 = "UPDATE moo\_kriteria SET bobot='$\_POST[biology]' WHERE id\_criteria=4";

if (mysqli\_query($db, $sql4)) {

  } else {

}

//update PHYSICS on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql5 = "UPDATE moo\_kriteria SET bobot='$\_POST[physics]' WHERE id\_criteria=5";

if (mysqli\_query($db, $sql5)) {

  } else {

}

//update CHEMISTRY on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql6 = "UPDATE moo\_kriteria SET bobot='$\_POST[biology]' WHERE id\_criteria=6";

if (mysqli\_query($db, $sql6)) {

  } else {

}

//update CRE/IRE on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql7 = "UPDATE moo\_kriteria SET bobot='$\_POST[creire]' WHERE id\_criteria=7";

if (mysqli\_query($db, $sql7)) {

  } else {

}

//update Geography/History on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql8 = "UPDATE moo\_kriteria SET bobot='$\_POST[geohis]' WHERE id\_criteria=8";

if (mysqli\_query($db, $sql8)) {

  } else {

}

//update ELECTIVE on new submission of grades//

if (!$db) {

    die("Connection failed: " . mysqli\_connect\_error());

}

$sql9 = "UPDATE moo\_kriteria SET bobot='$\_POST[elective]' WHERE id\_criteria=9";

if (mysqli\_query($db, $sql9)) {

  } else {

}

mysqli\_close($db);

?>

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="utf-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="keywords" content="" />

    <meta name="author" content="" />

    <meta name="robots" content="" />

    <link rel="icon" href="../error-404.html" type="image/x-icon" />

    <link rel="shortcut icon" type="image/x-icon" href="assets/images/favicon.png" />

    <title>BetterUni: Student Portal </title>

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

    <link rel="stylesheet" type="text/css" href="assets/css/assets.css">

    <link rel="stylesheet" type="text/css" href="assets/vendors/calendar/fullcalendar.css">

    <link rel="stylesheet" type="text/css" href="assets/css/typography.css">

    <link rel="stylesheet" type="text/css" href="assets/css/shortcodes/shortcodes.css">

    <link rel="stylesheet" type="text/css" href="assets/css/style.css">

    <link rel="stylesheet" type="text/css" href="assets/css/dashboard.css">

    <link class="skin" rel="stylesheet" type="text/css" href="assets/css/color/color-1.css">

    <link rel="stylesheet" type="text/css" href="assets/css/assets.css">

    <link rel="stylesheet" type="text/css" href="assets/vendors/calendar/fullcalendar.css">

    <link rel="stylesheet" type="text/css" href="assets/css/typography.css">

    <link rel="stylesheet" type="text/css" href="assets/css/shortcodes/shortcodes.css">

    <link rel="stylesheet" type="text/css" href="assets/css/style.css">

    <link rel="stylesheet" type="text/css" href="assets/css/dashboard.css">

    <link class="skin" rel="stylesheet" type="text/css" href="assets/css/color/color-1.css">

    <link rel="stylesheet" type="text/css" href="css/util.css">

    <link rel="stylesheet" type="text/css" href="css/main.css">

</head>

<body class="ttr-opened-sidebar ttr-pinned-sidebar">

    <!-- header start -->

    <header class="ttr-header">

        <div class="ttr-header-wrapper">

            <!--sidebar menu toggler start -->

            <div class="ttr-toggle-sidebar ttr-material-button">

                <i class="ti-menu ttr-close-icon"></i>

                <i class="ti-close ttr-open-icon"></i>

            </div>

            <!--sidebar menu toggler end -->

            <div class="ttr-header-menu">

                <!-- header left menu start -->

                <ul class="ttr-header-navigation">

                    <li>

                        <a href="dashboard.html" class="ttr-material-button ttr-submenu-toggle">HOME</a>

                    </li>

                </ul>

                <!-- header left menu end -->

            </div>

            <div class="ttr-header-right ttr-with-seperator">

                <!-- header right menu start -->

                <ul class="ttr-header-navigation">

                    <li>

                        <a href="#" class="ttr-material-button ttr-search-toggle"><i class="fa fa-search"></i></a>

                    </li>

                    <li>

                        <a href="#" class="ttr-material-button ttr-submenu-toggle"><i class="fa fa-user" aria-hidden="true"></i></a>

                        <div class="ttr-header-submenu">

                            <ul>

                                <li><a href="user-profile.php">My profile</a></li>

                                <li><a href="basket.php">Applied Courses</a></li>

                                <li><a href="mailbox.html">Messages</a></li>

                                <li><a href="login.html">Logout</a></li>

                            </ul>

                        </div>

                    </li>

                </ul>

                <!-- header right menu end -->

            </div>

            <!--header search panel start -->

            <div class="ttr-search-bar">

                <form class="ttr-search-form">

                    <div class="ttr-search-input-wrapper">

                        <input type="text" name="qq" placeholder="search something..." class="ttr-search-input">

                        <button type="submit" name="search" class="ttr-search-submit"><i class="ti-arrow-right"></i></button>

                    </div>

                    <span class="ttr-search-close ttr-search-toggle">

                        <i class="ti-close"></i>

                    </span>

                </form>

            </div>

            <!--header search panel end -->

        </div>

    </header>

    <!-- header end -->

    <!-- Left sidebar menu start -->

    <div class="ttr-sidebar">

        <div class="ttr-sidebar-wrapper content-scroll">

            <!-- sidebar menu start -->

            <nav class="ttr-sidebar-navi">

                <ul>

                    <li>

                        <a href="dashboard.html" class="ttr-material-button">

                            <span class="ttr-icon"><i class="ti-home"></i></span>

                            <span class="ttr-label">Dashboard</span>

                        </a>

                    </li>

                    <li>

                        <a href="#" class="ttr-material-button">

                            <span class="ttr-icon"><i class="ti-book"></i></span>

                            <span class="ttr-label">Programmes</span>

                            <span class="ttr-arrow-icon"><i class="fa fa-angle-down"></i></span>

                        </a>

                        <ul>

                            <li>

                                <a href="courses.php" class="ttr-material-button"><span class="ttr-label">Degree</span></a>

                            </li>

                            <li>

                                <a href="diploma.html" class="ttr-material-button"><span class="ttr-label">Diploma</span></a>

                            </li>

                            <li>

                                <a href="certificate.html" class="ttr-material-button"><span class="ttr-label">Certificate</span></a>

                            </li>

                        </ul>

                    </li>

                    <li>

                        <a href="application.php" class="ttr-material-button">

                            <span class="ttr-icon"><i class="ti-home"></i></span>

                            <span class="ttr-label">Application/Revision</span>

                        </a>

                    </li>

                </ul>

                <!-- sidebar menu end -->

            </nav>

            <!-- sidebar menu end -->

        </div>

    </div>

    <!-- Left sidebar menu end -->

    <!--Main container start -->

    <main class="ttr-wrapper">

        <div class="container-fluid">

            <div class="db-breadcrumb">

                <h4 class="breadcrumb-title">Dashboard</h4>

                <ul class="db-breadcrumb-list">

                    <li><a href="#"><i class="fa fa-home"></i>Home</a></li>

                    <li>Revision/Application</li>

                </ul>

            </div>

            <!-- Card -->

            <div class="row">

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg1">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Degree Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats">

                                <span class="counter">90</span>

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg2">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                 Diploma Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats counter">

                                20

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg3">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Certificate Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats counter">

                                70

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg4">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Universities & Colleges

                            </h4>

                            <span class="wc-stats counter">

                                80

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

            </div>

            <!-- Card END -->

            <div class="row">

                <span class="login100-form-title">

                    Below are your subject scores<br>

                </span>

                <!--form start here-->

                <form class="login100-form validate-form"  method="post" action="optimize.php">

                <table border="2">

                    <?php

                        if (!empty($\_POST)){

                            $english = $\_POST['english'];

                            $kiswahili = $\_POST['kiswahili'];

                            $mathematics = $\_POST['mathematics'];

                            $biology = $\_POST['biology'];

                            $chemistry = $\_POST['chemistry'];

                            $physics = $\_POST['physics'];

                            $creire = $\_POST['creire'];

                            $geohis = $\_POST['geohis'];

                            $elective = $\_POST['elective'];

                        }

                        echo "<tr>"."<th><em>Subject Name</em></th>". "<th><em><b>Subject Score</b></em></th>" ."</tr>";

                        echo "<tr>"."<th><em>English</em></th>". "<th>$english</th>" ."</tr>";

                        echo "<tr>"."<th><em>Kiswahili</em></th>". "<th>$kiswahili</th>" ."</tr>";

                        echo "<tr>"."<th><em>Mathematics</em></th>". "<th>$mathematics</th>" ."</tr>";

                        echo "<tr>"."<th><em>Biology</em></th>". "<th>$biology</th>" ."</tr>";

                        echo "<tr>"."<th><em>Chemistry</em></th>". "<th>$chemistry</th>" ."</tr>";

                        echo "<tr>"."<th><em>Physics</em></th>". "<th>$physics</th>" ."</tr>";

                        echo "<tr>"."<th><em>CRE/IRE</em></th>". "<th>$creire</th>" ."</tr>";

                        echo "<tr>"."<th><em>GEO/HIS</em></th>". "<th>$geohis</th>" ."</tr>";

                        echo "<tr>"."<th><em>Elective</em></th>". "<th>$elective</th>" ."</tr>";

                    ?>

                </table>

                </form>

                <?php include\_once 'optimize.php';?>

            </div>

        </div>

    </main>

    <div class="ttr-overlay"></div>

<!-- External JavaScripts -->

    <script src="assets/js/jquery.min.js"></script>

    <script src="assets/vendors/bootstrap/js/popper.min.js"></script>

    <script src="assets/vendors/bootstrap/js/bootstrap.min.js"></script>

    <script src="assets/vendors/bootstrap-select/bootstrap-select.min.js"></script>

    <script src="assets/vendors/bootstrap-touchspin/jquery.bootstrap-touchspin.js"></script>

    <script src="assets/vendors/magnific-popup/magnific-popup.js"></script>

    <script src="assets/vendors/counter/waypoints-min.js"></script>

    <script src="assets/vendors/counter/counterup.min.js"></script>

    <script src="assets/vendors/imagesloaded/imagesloaded.js"></script>

    <script src="assets/vendors/masonry/masonry.js"></script>

    <script src="assets/vendors/masonry/filter.js"></script>

    <script src="assets/vendors/owl-carousel/owl.carousel.js"></script>

    <script src='assets/vendors/scroll/scrollbar.min.js'></script>

    <script src="assets/js/functions.js"></script>

    <script src="assets/vendors/chart/chart.min.js"></script>

    <script src="assets/js/admin.js"></script>

    <script src='assets/vendors/calendar/moment.min.js'></script>

    <script src='assets/vendors/calendar/fullcalendar.js'></script>

    <script src='assets/vendors/switcher/switcher.js'></script>

</body>

</html>

**optimize.php**

This is the php code that runs in the background in order for the application page to load with the full optimization results.

<?php

$dbhost = 'localhost';

$dbuser = 'root';

$dbpass = '';

$dbname = 'betteruni';

$konek = new mysqli($dbhost,$dbuser,$dbpass,$dbname);

if ($konek->connect\_error) {

   die('Connect Error ('.$konek->connect\_errno.')'.$konek->connect\_error);

}

//database reading to collect the values for criteria

$sql = 'SELECT \* FROM moo\_kriteria';

$result = $konek->query($sql);

$kriteria=array();

foreach ($result as $row) {

   $kriteria[$row['id\_criteria']]=array($row['kriteria'],$row['type'],$row['bobot']);

}

//database reading to collect the registered courses

$sql = 'SELECT \* FROM courses';

$result = $konek->query($sql);

$alternatif=array();

foreach ($result as $row) {

   $alternatif[$row['id\_alternative']] = array(

     $row['coursename'],

     $row['coursecode'],

     $row['institution'],

     $row['cutoffpoints'],

     $row['clustergroup']

   );

}

//preparation of the matrix for optimization

$sql = 'SELECT \* FROM weights ORDER BY id\_alternative, id\_criteria';

$result = $konek->query($sql);

$sample=array();

foreach ($result as $row) {

   $sample[$row['id\_alternative']][$row['id\_criteria']] = $row['weights'];

}

//Normalization of the matrix

$normal = $sample;

foreach($kriteria as $id\_kriteria=>$k){

   $pembagi=0;

      foreach($alternatif as $id\_ikm=>$a){

      $pembagi+=pow($sample[$id\_ikm][$id\_kriteria],2);

   }

   foreach($alternatif as $id\_ikm=>$a){

      $normal[$id\_ikm][$id\_kriteria]/=sqrt($pembagi);

   }

}

//Optimization of the mormalised values from the matrix

$optimasi=array();

foreach($alternatif as $id\_ikm=>$a){

   $optimasi[$id\_ikm] = 0;

   foreach($kriteria as $id\_kriteria => $k){

     $optimasi[$id\_ikm] += $normal[$id\_ikm][$id\_kriteria] \* ($k[1] == 'benefit' ? 1 : -1) \* $k[2];

    }

}

?>

<br />

<div class="container-fluid">

  <div class="col-xl-12 col-lg-8">

    <div class="card shadow mb-4">

      <div class="card-header">

        <div class="row">

          <div class="col-lg-6 col-xl-6">

            <h5 class="mt-2 font-weight text-info"> <b> Alternative Value Capture </b></h5>

          </div>

        </div>

      </div>

      <div class="card-body">

        <table border="border-left-info" class="display table table-bordered" width="100%" cellspacing="0">

          <thead align="center">

            <tr>

              <th>Courses</th>

              <?php

                  foreach ($kriteria as $key => $value) {

                  echo "<th>".$value[0]."</th>";

                }

                ?>

            </tr>

          </thead>

          <tbody align="center">

            <?php

              foreach ($sample as $key => $value) {

                echo "<tr>";

                echo "<td>".$alternatif[$key][0]."</td>";

              for ($i=1; $i <= count($value) ; $i++) {

                echo "<td>".$value[$i]."</td>";

                }

                echo "</tr>";

              }

              ?>

          </tbody>

        </table>

      </div>

    </div>

  </div>

</div>

<div class="container-fluid">

  <div class="col-xl-12 col-lg-8">

    <div class="card shadow mb-4">

      <div class="card-header">

        <div class="row">

          <div class="col-lg-6 col-xl-6">

            <h5 class="mt-2 font-weight text-info"> <b> Creating a NORMALIZATION matrix </b></h5>

          </div>

        </div>

      </div>

      <div class="card-body">

        <table border="border-left-info" class="display table table-bordered"  width="100%" cellspacing="0">

          <thead align="center">

            <tr>

              <th>Courses</th>

              <?php

                  foreach ($kriteria as $key => $value) {

                  echo "<th>".$value[0]."</th>";

                }

                ?>

            </tr>

          </thead>

          <tbody align="center">

            <?php

              foreach ($normal as $key => $value) {

                echo "<tr>";

                echo "<td>".$alternatif[$key][0]."</td>";

              for ($i=1; $i <= count($value) ; $i++) {

                echo "<td>".$value[$i]."</td>";

                }

                echo "</tr>";

              }

            ?>

          </tbody>

        </table>

      </div>

    </div>

  </div>

</div>

<div class="container-fluid">

  <div class="col-xl-12 col-lg-8">

    <div class="card shadow mb-4">

      <div class="card-header">

        <div class="row">

          <div class="col-lg-6 col-xl-6">

            <h5 class="mt-2 font-weight text-info"> <b> Calculation of optimization values </b></h5>

          </div>

        </div>

      </div>

      <div class="card-body">

        <table border="border-left-info" class="display table table-bordered" width="100%" cellspacing="0">

          <thead align="center">

            <tr>

              <th>Optimized Courses</th>

              <th>Optimization Value</th>

            </tr>

          </thead>

          <tbody align="center">

            <?php

              foreach ($optimasi as $key => $value) {

                echo "<tr>";

                echo "<td>".$alternatif[$key][0]."</td>";

                $angka\_format = number\_format($value,6);

                echo "<td>" .$angka\_format. "</td>";

                echo "</tr>";

              }

              ?>

          </tbody>

        </table>

      </div>

    </div>

  </div>

</div>

<div class="container-fluid">

  <div class="col-xl-12 col-lg-8">

    <div class="card shadow mb-4">

      <div class="card-header">

        <div class="row">

          <div class="col-lg-6 col-xl-6">

            <h5 class="mt-2 font-weight text-info"> <b> Recommended Courses </b></h5>

          </div>

        </div>

      </div>

      <div class="card-body">

        <?php

        arsort($optimasi);

        $index = key($optimasi);

        $hasil\_alternatif = $alternatif[$index][0];

        $hasil\_optimasi = number\_format($optimasi[$index],6);

        echo " The result is an alternative <b><em>".$hasil\_alternatif."</em></b> ";

        echo " with value <b><em>".$hasil\_optimasi."</em></b> selected to be prioritized to get help";

        echo ""

        ?>

      </div>

    </div>

  </div>

</div>

**courses.php**

This is the code that displays available courses to the candidate under the programme side menu.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="utf-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="keywords" content="" />

    <meta name="author" content="" />

    <meta name="robots" content="" />

    <link rel="icon" href="../error-404.html" type="image/x-icon" />

    <link rel="shortcut icon" type="image/x-icon" href="assets/images/favicon.png" />

    <title>BetterUni: Student Portal </title>

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

    <link rel="stylesheet" type="text/css" href="assets/css/assets.css">

    <link rel="stylesheet" type="text/css" href="assets/vendors/calendar/fullcalendar.css">

    <link rel="stylesheet" type="text/css" href="assets/css/typography.css">

    <link rel="stylesheet" type="text/css" href="assets/css/shortcodes/shortcodes.css">

    <link rel="stylesheet" type="text/css" href="assets/css/style.css">

    <link rel="stylesheet" type="text/css" href="assets/css/dashboard.css">

    <link class="skin" rel="stylesheet" type="text/css" href="assets/css/color/color-1.css">

    <link rel="stylesheet" type="text/css" href="assets/css/assets.css">

    <link rel="stylesheet" type="text/css" href="assets/vendors/calendar/fullcalendar.css">

    <link rel="stylesheet" type="text/css" href="assets/css/typography.css">

    <link rel="stylesheet" type="text/css" href="assets/css/shortcodes/shortcodes.css">

    <link rel="stylesheet" type="text/css" href="assets/css/style.css">

    <link rel="stylesheet" type="text/css" href="assets/css/dashboard.css">

    <link class="skin" rel="stylesheet" type="text/css" href="assets/css/color/color-1.css">

    <link rel="stylesheet" type="text/css" href="css/util.css">

    <link rel="stylesheet" type="text/css" href="css/main.css">

</head>

<body class="ttr-opened-sidebar ttr-pinned-sidebar">

    <!-- header start -->

    <header class="ttr-header">

        <div class="ttr-header-wrapper">

            <!--sidebar menu toggler start -->

            <div class="ttr-toggle-sidebar ttr-material-button">

                <i class="ti-menu ttr-close-icon"></i>

                <i class="ti-close ttr-open-icon"></i>

            </div>

            <!--sidebar menu toggler end -->

            <div class="ttr-header-menu">

                <!-- header left menu start -->

                <ul class="ttr-header-navigation">

                    <li>

                        <a href="dashboard.html" class="ttr-material-button ttr-submenu-toggle">HOME</a>

                    </li>

                </ul>

                <!-- header left menu end -->

            </div>

            <div class="ttr-header-right ttr-with-seperator">

                <!-- header right menu start -->

                <ul class="ttr-header-navigation">

                    <li>

                        <a href="#" class="ttr-material-button ttr-search-toggle"><i class="fa fa-search"></i></a>

                    </li>

                    <li>

                        <a href="#" class="ttr-material-button ttr-submenu-toggle"><i class="fa fa-user" aria-hidden="true"></i></a>

                        <div class="ttr-header-submenu">

                            <ul>

                                <li><a href="user-profile.php">My profile</a></li>

                                <li><a href="basket.php">Applied Courses</a></li>

                                <li><a href="mailbox.html">Messages</a></li>

                                <li><a href="login.html">Logout</a></li>

                            </ul>

                        </div>

                    </li>

                </ul>

                <!-- header right menu end -->

            </div>

            <!--header search panel start -->

            <div class="ttr-search-bar">

                <form class="ttr-search-form">

                    <div class="ttr-search-input-wrapper">

                        <input type="text" name="qq" placeholder="search something..." class="ttr-search-input">

                        <button type="submit" name="search" class="ttr-search-submit"><i class="ti-arrow-right"></i></button>

                    </div>

                    <span class="ttr-search-close ttr-search-toggle">

                        <i class="ti-close"></i>

                    </span>

                </form>

            </div>

            <!--header search panel end -->

        </div>

    </header>

    <!-- header end -->

    <!-- Left sidebar menu start -->

    <div class="ttr-sidebar">

        <div class="ttr-sidebar-wrapper content-scroll">

            <!-- sidebar menu start -->

            <nav class="ttr-sidebar-navi">

                <ul>

                    <li>

                        <a href="dashboard.html" class="ttr-material-button">

                            <span class="ttr-icon"><i class="ti-home"></i></span>

                            <span class="ttr-label">Dashboard</span>

                        </a>

                    </li>

                    <li>

                        <a href="#" class="ttr-material-button">

                            <span class="ttr-icon"><i class="ti-book"></i></span>

                            <span class="ttr-label">Programmes</span>

                            <span class="ttr-arrow-icon"><i class="fa fa-angle-down"></i></span>

                        </a>

                        <ul>

                            <li>

                                <a href="courses.php" class="ttr-material-button"><span class="ttr-label">Degree</span></a>

                            </li>

                            <li>

                                <a href="diploma.html" class="ttr-material-button"><span class="ttr-label">Diploma</span></a>

                            </li>

                            <li>

                                <a href="certificate.html" class="ttr-material-button"><span class="ttr-label">Certificate</span></a>

                            </li>

                        </ul>

                    </li>

                    <li>

                        <a href="application.php" class="ttr-material-button">

                            <span class="ttr-icon"><i class="ti-home"></i></span>

                            <span class="ttr-label">Application/Revision</span>

                        </a>

                    </li>

                </ul>

                <!-- sidebar menu end -->

            </nav>

            <!-- sidebar menu end -->

        </div>

    </div>

    <!-- Left sidebar menu end -->

    <!--Main container start -->

    <main class="ttr-wrapper">

        <div class="container-fluid">

            <div class="db-breadcrumb">

                <h4 class="breadcrumb-title">Dashboard</h4>

                <ul class="db-breadcrumb-list">

                    <li><a href="#"><i class="fa fa-home"></i>Home</a></li>

                    <li>Courses</li>

                </ul>

            </div>

            <!-- Card -->

            <div class="row">

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg1">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Degree Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats">

                                <span class="counter">90</span>

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg2">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                 Diploma Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats counter">

                                20

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg3">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Certificate Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats counter">

                                70

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg4">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Universities & Colleges

                            </h4>

                            <span class="wc-stats counter">

                                1

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

            </div>

            <!-- Card END -->

            <div class="row">

                <div class="container-fluid">

                    <div class="col-xl-12 col-lg-8">

                        <div class="card shadow mb-4">

                            <div class="card-header">

                                <div class="row">

                                    <div class="col-lg-6 col-xl-6">

                                        <h5 class="mt-2 font-weight text-info"> <b> Courses </b></h5>

                                    </div>

                                </div>

                            </div>

                            <div class="card-body">

                                <span class="login100-form-title">

                                    <table border="2">

                                        <tr>

                                        <td><em>Course Code</em></td>

                                        <td><em>Course Name</em></td>

                                        <td><em>Institution</em></td>

                                        <td><em>Cut-Off Points</em></td>

                                        </tr>

                                    <?php

                                    include "dbConn.php"; // Using database connection file here

                                    $records = mysqli\_query($db,"select \* from courses"); // fetch data from database

                                    while($data = mysqli\_fetch\_array($records))

                                    {

                                    ?>

                                        <tr>

                                        <td><?php echo $data['coursecode']; ?></td>

                                        <td><em><?php echo $data['coursename']; ?></em></td>

                                        <td><?php echo $data['institution']; ?></td>

                                        <td><?php echo $data['cutoffpoints']; ?></td>

                                        </tr>

                                    <?php

                                    }

                                    ?>

                                    </table>

                                    <?php mysqli\_close($db);?>

                                </span>

                            </div>

                        </div>

                    </div>

                </div>

                <!--form start here-->

                <form class="login100-form validate-form" action="cluster.php" method="post">

                </form>

            </div>

        </div>

    </main>

    <div class="ttr-overlay"></div>

<!-- External JavaScripts -->

    <script src="assets/js/jquery.min.js"></script>

    <script src="assets/vendors/bootstrap/js/popper.min.js"></script>

    <script src="assets/vendors/bootstrap/js/bootstrap.min.js"></script>

    <script src="assets/vendors/bootstrap-select/bootstrap-select.min.js"></script>

    <script src="assets/vendors/bootstrap-touchspin/jquery.bootstrap-touchspin.js"></script>

    <script src="assets/vendors/magnific-popup/magnific-popup.js"></script>

    <script src="assets/vendors/counter/waypoints-min.js"></script>

    <script src="assets/vendors/counter/counterup.min.js"></script>

    <script src="assets/vendors/imagesloaded/imagesloaded.js"></script>

    <script src="assets/vendors/masonry/masonry.js"></script>

    <script src="assets/vendors/masonry/filter.js"></script>

    <script src="assets/vendors/owl-carousel/owl.carousel.js"></script>

    <script src='assets/vendors/scroll/scrollbar.min.js'></script>

    <script src="assets/js/functions.js"></script>

    <script src="assets/vendors/chart/chart.min.js"></script>

    <script src="assets/js/admin.js"></script>

    <script src='assets/vendors/calendar/moment.min.js'></script>

    <script src='assets/vendors/calendar/fullcalendar.js'></script>

    <script src='assets/vendors/switcher/switcher.js'></script>

</body>

</html>

**INSTITUTION PORTAL**

**loginin.html**

This the log-in page for institution user.

<!DOCTYPE html>

<html lang="en">

<head>

    <title>BetterUni: Institution Login</title>

    <meta charset="UTF-8">

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

    <link rel="icon" href="assets/images/favicon.ico" type="image/x-icon" />

    <link rel="stylesheet" type="text/css" href="vendor/bootstrap/css/bootstrap.min.css">

    <link rel="stylesheet" type="text/css" href="fonts/font-awesome-4.7.0/css/font-awesome.min.css">

    <link rel="stylesheet" type="text/css" href="vendor/animate/animate.css">

    <link rel="stylesheet" type="text/css" href="vendor/css-hamburgers/hamburgers.min.css">

    <link rel="stylesheet" type="text/css" href="vendor/select2/select2.min.css">

    <link rel="stylesheet" type="text/css" href="css/util.css">

    <link rel="stylesheet" type="text/css" href="css/main.css">

</head>

<body>

    <div class="limiter">

        <div class="container-login100">

            <div class="wrap-login100">

                <div class="login100-pic js-tilt" data-tilt>

                    <img src="images/img-01.png" alt="IMG">

                </div>

                <form class="login100-form validate-form" action="loginin.php" method="post">

                    <span class="login100-form-title">

                        Institution Login

                    </span>

                    <div class="wrap-input100 validate-input" data-validate = "Valid email is required: ex. johndoe@abc.xyz">

                        <input class="input100" type="text" name="email" id="email" placeholder="Email">

                        <span class="focus-input100"></span>

                        <span class="symbol-input100">

                            <i class="fa fa-envelope" aria-hidden="true"></i>

                        </span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "Password is required">

                        <input class="input100" type="password" name="password" id="password" placeholder="Password">

                        <span class="focus-input100"></span>

                        <span class="symbol-input100">

                            <i class="fa fa-lock" aria-hidden="true"></i>

                        </span>

                    </div>

                    <div class="container-login100-form-btn">

                        <button class="login100-form-btn">

                            Login

                        </button>

                    </div>

                    <div class="text-center p-t-12">

                        <span class="txt1">

                            Forgot

                        </span>

                        <a class="txt2" href="forget-password.html">

                            Username / Password?

                        </a>

                    </div>

                </form>

            </div>

        </div>

    </div>

    <script src="vendor/jquery/jquery-3.2.1.min.js"></script>

    <script src="vendor/bootstrap/js/popper.js"></script>

    <script src="vendor/bootstrap/js/bootstrap.min.js"></script>

    <script src="vendor/select2/select2.min.js"></script>

    <script src="vendor/tilt/tilt.jquery.min.js"></script>

    <script >

        $('.js-tilt').tilt({

            scale: 1.1

        })

    </script>

    <script src="js/main.js"></script>

</body>

</html>

**loginin.php**

this is the php code that validates the institution user on the sytem.

<?php

    $email = $\_POST['email'];

    $password = $\_POST['password'];

    //Database Connection//

    $conn = new mysqli('localhost','root','','betteruni');

    if($conn->connect\_error) {

        die('Connection Failed : '.$conn->connect\_error);

    }else {

        $stmt = $conn->prepare("SELECT \* FROM instuser where email = ?");

        $stmt->bind\_param("s", $email);

        $stmt->execute();

        $stmt\_result = $stmt->get\_result();

        if($stmt\_result->num\_rows > 0 ) {

            $data = $stmt\_result->fetch\_assoc();

            if($data['password'] === $password) {

                echo "<h2>Login Successfully</h2>";

                header("location: dashboardin.php");

            }else {

                echo "<h2>Invalid Email or Password</h2>";

            }

        }else {

            echo "<h2>Invalid Email or Password</h2>";

        }

    }

?>

**dashboardin.php**

This is the page used by the institution to update the courses table of new courses and the specific information related to the course been added.

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="utf-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="keywords" content="" />

    <meta name="author" content="" />

    <meta name="robots" content="" />

    <link rel="icon" href="../error-404.html" type="image/x-icon" />

    <link rel="shortcut icon" type="image/x-icon" href="assets/images/favicon.png" />

    <title>BetterUni: Institution Portal</title>

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

    <link rel="stylesheet" type="text/css" href="assets/css/assets.css">

    <link rel="stylesheet" type="text/css" href="assets/vendors/calendar/fullcalendar.css">

    <link rel="stylesheet" type="text/css" href="assets/css/typography.css">

    <link rel="stylesheet" type="text/css" href="assets/css/shortcodes/shortcodes.css">

    <link rel="stylesheet" type="text/css" href="assets/css/style.css">

    <link rel="stylesheet" type="text/css" href="assets/css/dashboard.css">

    <link class="skin" rel="stylesheet" type="text/css" href="assets/css/color/color-1.css">

    <link rel="stylesheet" type="text/css" href="css/util.css">

    <link rel="stylesheet" type="text/css" href="css/main.css">

</head>

<body class="ttr-opened-sidebar ttr-pinned-sidebar">

    <!-- header start -->

    <header class="ttr-header">

        <div class="ttr-header-wrapper">

            <!--sidebar menu toggler start -->

            <div class="ttr-toggle-sidebar ttr-material-button">

                <i class="ti-close ttr-open-icon"></i>

                <i class="ti-menu ttr-close-icon"></i>

            </div>

            <!--sidebar menu toggler end -->

            <div class="ttr-header-menu">

                <!-- header left menu start -->

                <ul class="ttr-header-navigation">

                    <li>

                        <a href="dashboardin.php" class="ttr-material-button ttr-submenu-toggle">HOME</a>

                    </li>

                </ul>

                <ul>

                    <center>

                    <iframe width="200px" height="60px" scrolling="no" src="clock.html"></iframe>

                    </center>

                </ul>

                <!-- header left menu end -->

            </div>

            <div class="ttr-header-right ttr-with-seperator">

                <!-- header right menu start -->

                <ul class="ttr-header-navigation">

                    <li>

                        <a href="#" class="ttr-material-button ttr-search-toggle"><i class="fa fa-search"></i></a>

                    </li>

                    <li>

                        <a href="#" class="ttr-material-button ttr-submenu-toggle"><i class="fa fa-user" aria-hidden="true"></i></a>

                        <div class="ttr-header-submenu">

                            <ul>

                                <li><a href="user-profilein.php">My profile</a></li>

                                <li><a href="mailbox.html">Messages</a></li>

                                <li><a href="index.html">Logout</a></li>

                            </ul>

                        </div>

                    </li>

                </ul>

                <!-- header right menu end -->

            </div>

            <!--header search panel start -->

            <div class="ttr-search-bar">

                <form class="ttr-search-form">

                    <div class="ttr-search-input-wrapper">

                        <input type="text" name="qq" placeholder="search something..." class="ttr-search-input">

                        <button type="submit" name="search" class="ttr-search-submit"><i class="ti-arrow-right"></i></button>

                    </div>

                    <span class="ttr-search-close ttr-search-toggle">

                        <i class="ti-close"></i>

                    </span>

                </form>

            </div>

            <!--header search panel end -->

        </div>

    </header>

    <!-- header end -->

    <!-- Left sidebar menu start -->

    <div class="ttr-sidebar">

        <div class="ttr-sidebar-wrapper content-scroll">

            <!-- sidebar menu start -->

            <nav class="ttr-sidebar-navi">

                <ul>

                    <li>

                        <a href="dashboardin.php" class="ttr-material-button">

                            <span class="ttr-icon"><i class="ti-home"></i></span>

                            <span class="ttr-label">Dashboard</span>

                        </a>

                    </li>

                </ul>

            </nav>

        </div>

    </div>

    <!-- Left sidebar menu end -->

    <!--Main container start -->

    <main class="ttr-wrapper">

        <div class="container-fluid">

            <div class="db-breadcrumb">

                <h4 class="breadcrumb-title">Dashboard</h4>

                <ul class="db-breadcrumb-list">

                    <li><a href="#"><i class="fa fa-home"></i>Home</a></li>

                    <li>Dashboard</li>

                </ul>

            </div>

            <!-- Card -->

            <div class="row">

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg1">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Degree Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats">

                                <span class="counter">80</span>

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg2">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                 Diploma Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats counter">

                                60

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

                <div class="col-md-6 col-lg-3 col-xl-3 col-sm-6 col-12">

                    <div class="widget-card widget-bg3">

                        <div class="wc-item">

                            <h4 class="wc-title">

                                Certificate Programmes

                            </h4>

                            <span class="wc-des">

                            </span>

                            <span class="wc-stats counter">

                                40

                            </span>

                            <div class="progress wc-progress">

                                <div class="progress-bar" role="progressbar" style="width: 100%;" aria-valuenow="50" aria-valuemin="0" aria-valuemax="100"></div>

                            </div>

                            <span class="wc-progress-bx">

                                <span class="wc-change">

                                </span>

                                <span class="wc-number ml-auto">

                                </span>

                            </span>

                        </div>

                    </div>

                </div>

            </div>

            <!-- Card END -->

            <div class="row">

                <span class="login100-form-title">

                    <h2>Fill in below the <em>Course name</em>, <em>Course code</em> , <em>Institution</em> and <em>Cut-off Points</em></h2><br>

                </span>

                <form class="login100-form validate-form" action="submit.php" method="post">

                    <div class="wrap-input100 validate-input" data-validate = "What is the course code?">

                        <input class="input100" type="number" name="coursecode" id="coursecode" placeholder="Course code">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What is the course name?">

                        <input class="input100" type="text" name="coursename" id="coursename" placeholder="Course Name">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What is your course aggregate points?">

                        <input class="input100" type="text" name="institution" id="institution" placeholder="Institution">

                        <span class="focus-input100"></span>

                    </div>

                    <div class="wrap-input100 validate-input" data-validate = "What is the course clusterpoints?">

                        <input class="input100" type="number" step="0.001" name="cutoffpoints" id="cutoffpoints" placeholder="Cut-Off Points">

                        <span class="focus-input100"></span>

                    </div>

                    <pre></pre>

                    <div class="container-login100-form-btn">

                        <button class="login100-form-btn">

                            SUBMIT

                        </button>

                    </div>

                    <pre></pre>

                    <form>

                        <div class="ttr-overlay">

                        </div>

                    </form>

                </form>

                <span class="login100-form-title">

                    Courses Details

                </span>

                <span class="login100-form-title">

                    <table border="1">

                        <tr>

                          <td><em>Course Code</em></td>

                          <td><em>Course Name</em></td>

                          <td><em>Institution</em></td>

                          <td><em>Cut-Off Points</em></td>

                        </tr>

                      <?php

                      include "dbConn.php"; // Using database connection file here

                      $records = mysqli\_query($db,"select \* from courses"); // fetch data from database

                      while($data = mysqli\_fetch\_array($records))

                      {

                      ?>

                        <tr>

                          <td><?php echo $data['coursecode']; ?></td>

                          <td><?php echo $data['coursename']; ?></td>

                          <td><?php echo $data['institution']; ?></td>

                          <td><?php echo $data['cutoffpoints']; ?></td>

                        </tr>

                      <?php

                      }

                      ?>

                    </table>

                      <?php mysqli\_close($db); // Close connection ?

                      ?>

                    </span>

            </div>

        </div>

    </main>

    <script src="vendor/jquery/jquery-3.2.1.min.js"></script>

    <script src="vendor/bootstrap/js/popper.js"></script>

    <script src="vendor/bootstrap/js/bootstrap.min.js"></script>

    <script src="vendor/select2/select2.min.js"></script>

    <script src="vendor/tilt/tilt.jquery.min.js"></script>

    <script >

        $('.js-tilt').tilt({

            scale: 1.1

        })

    </script>

    <script src="js/main.js"></script>

    <script src="assets/js/jquery.min.js"></script>

    <script src="assets/vendors/bootstrap/js/popper.min.js"></script>

    <script src="assets/vendors/bootstrap/js/bootstrap.min.js"></script>

    <script src="assets/vendors/bootstrap-select/bootstrap-select.min.js"></script>

    <script src="assets/vendors/bootstrap-touchspin/jquery.bootstrap-touchspin.js"></script>

    <script src="assets/vendors/magnific-popup/magnific-popup.js"></script>

    <script src="assets/vendors/counter/waypoints-min.js"></script>

    <script src="assets/vendors/counter/counterup.min.js"></script>

    <script src="assets/vendors/imagesloaded/imagesloaded.js"></script>

    <script src="assets/vendors/masonry/masonry.js"></script>

    <script src="assets/vendors/masonry/filter.js"></script>

    <script src="assets/vendors/owl-carousel/owl.carousel.js"></script>

    <script src='assets/vendors/scroll/scrollbar.min.js'></script>

    <script src="assets/js/functions.js"></script>

    <script src="assets/vendors/chart/chart.min.js"></script>

    <script src="assets/js/admin.js"></script>

    <script src='assets/vendors/calendar/moment.min.js'></script>

    <script src='assets/vendors/calendar/fullcalendar.js'></script>

    <script src='assets/vendors/switcher/switcher.js'></script>

</body>

</html>

**submit.php**

This is the php code for submitting the new courses been inserted in the database by the institution portal user.

<?php

    $coursecode =$\_POST['coursecode'];

    $coursename =$\_POST['coursename'];

    $institution =$\_POST['institution'];

    $cutoffpoints =$\_POST['cutoffpoints'];

    //Database connection//

    $conn = new mysqli('localhost','root','','betteruni');

    if($conn->connect\_error){

        die('Connection Failed : '.$conn->connect\_error);

    }else{

        $stmt = $conn->prepare("INSERT INTO courses( coursecode, coursename, institution, cutoffpoints)

        values(?, ?, ?, ?)");

        $stmt->bind\_param("issi",$coursecode, $coursename, $institution, $cutoffpoints);

        $stmt->execute();

        echo "Submit successful";

        $stmt->close();

        $conn->close();

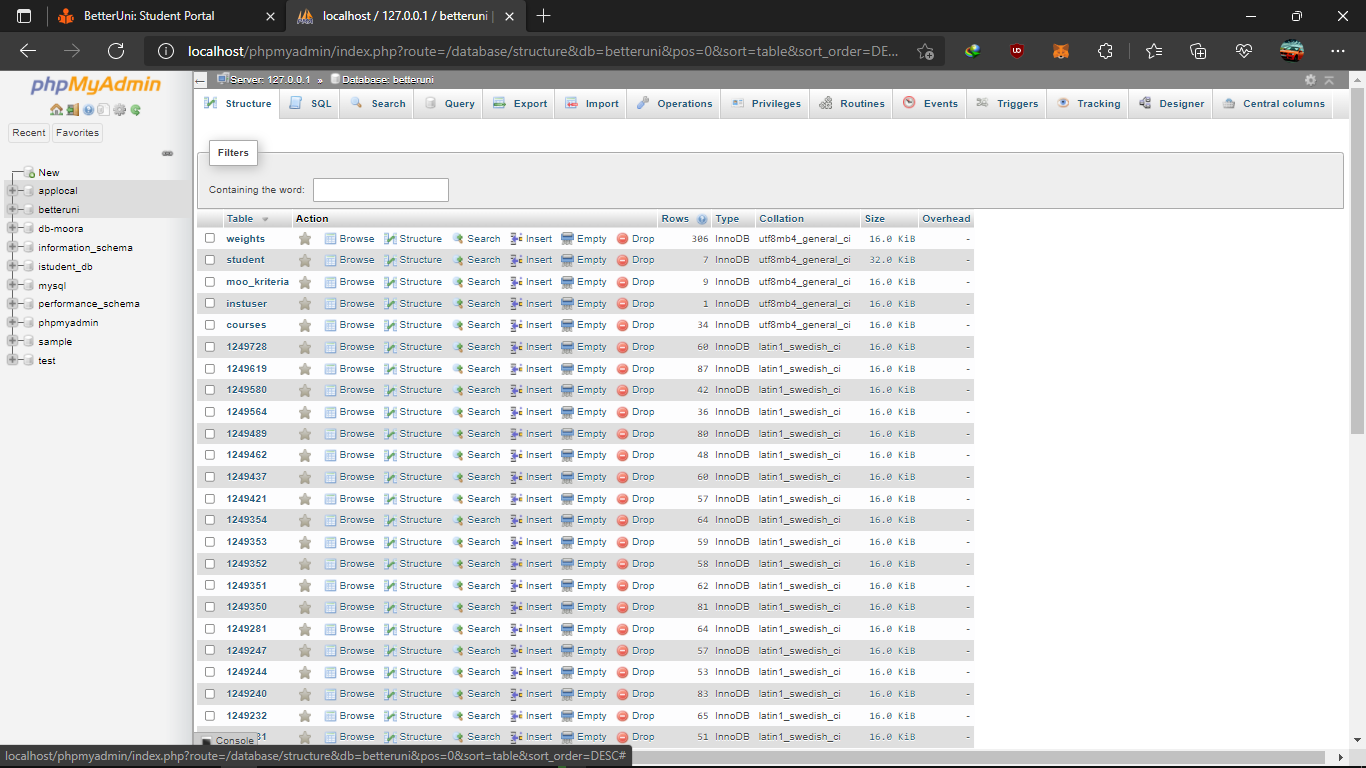
        header("location: dashboardin.php");

    }

?>

**DATABASE FILES**

For the database have created SQL files to be run to create the table in a database by the name ‘betteruni’. The unit weights where arranged in another table to easy the computation.



The Web Application database

**weights.sql**

CREATE TABLE IF NOT EXISTS `weights`(

  `id\_weight` INT(11) UNSIGNED AUTO\_INCREMENT,

  `id\_alternative` TINYINT(3) UNSIGNED,

  `id\_criteria` TINYINT(3) UNSIGNED,

  `weights` TINYINT(3) UNSIGNED NOT NULL,

  PRIMARY KEY(`id\_weight`)

)ENGINE=InnoDB;

INSERT INTO `weights`(`id\_alternative`,`id\_criteria`,`weights`)

VALUES

(1,1,7), (1,2,6), (1,3,5), (1,4,8), (1,5,5), (1,6,7), (1,7,4), (1,8,9), (1,9,6),

(2,1,5), (2,2,6), (2,3,5), (2,4,7), (2,5,8), (2,6,7), (2,7,5), (2,8,7), (2,9,8),

(3,1,7), (3,2,8), (3,3,7), (3,4,9), (3,5,10), (3,6,7), (3,7,8), (3,8,6), (3,9,7),

(4,1,7), (4,2,8), (4,3,9), (4,4,7), (4,5,7), (4,6,5), (4,7,6), (4,8,5), (4,9,5),

(5,1,8), (5,2,6), (5,3,8), (5,4,7), (5,5,9), (5,6,6), (5,7,5), (5,8,8), (5,9,7),

(6,1,5), (6,2,7), (6,3,7), (6,4,9), (6,5,8), (6,6,7), (6,7,7), (6,8,9), (6,9,9),

(7,1,5), (7,2,5), (7,3,7), (7,4,6), (7,5,8), (7,6,6), (7,7,7), (7,8,8), (7,9,7),

(8,1,5), (8,2,7), (8,3,8), (8,4,5), (8,5,5), (8,6,4), (8,7,7), (8,8,7), (8,9,6),

(9,1,5), (9,2,7), (9,3,6), (9,4,8), (9,5,6), (9,6,7), (9,7,5), (9,8,6), (9,9,8),

(10,1,5), (10,2,6), (10,3,7), (10,4,8), (10,5,7), (10,6,7), (10,7,7), (10,8,8), (10,9,5),

(11,1,5), (11,2,5), (11,3,8), (11,4,7), (11,5,8), (11,6,6), (11,7,7), (11,8,7), (11,9,8),

(12,1,5), (12,2,6), (12,3,7), (12,4,6), (12,5,8), (12,6,6), (12,7,7), (12,8,5), (12,9,6),

(13,1,5), (13,2,6), (13,3,8), (13,4,9), (13,5,5), (13,6,4), (13,7,6), (13,8,7), (13,9,8),

(14,1,7), (14,2,8), (14,3,9), (14,4,7), (14,5,8), (14,6,6), (14,7,8), (14,8,5), (14,9,6),

(15,1,5), (15,2,8), (15,3,5), (15,4,7), (15,5,9), (15,6,8), (15,7,7), (15,8,6), (15,9,5),

(16,1,7), (16,2,8), (16,3,9), (16,4,6), (16,5,7), (16,6,7), (16,7,8), (16,8,9), (16,9,7),

(17,1,5), (17,2,5), (17,3,7), (17,4,5), (17,5,6), (17,6,4), (17,7,8), (17,8,9), (17,9,6),

(18,1,5), (18,2,7), (18,3,6), (18,4,7), (18,5,8), (18,6,9), (18,7,6), (18,8,8), (18,9,7),

(19,1,5), (19,2,8), (19,3,9), (19,4,5), (19,5,7), (19,6,8), (19,7,9), (19,8,8), (19,9,7),

(20,1,7), (20,2,7), (20,3,6), (20,4,9), (20,5,8), (20,6,7), (20,7,6), (20,8,8), (20,9,5),

(21,1,5), (21,2,5), (21,3,5), (21,4,7), (21,5,7), (21,6,8), (21,7,8), (21,8,9), (21,9,8),

(22,1,5), (22,2,8), (22,3,7), (22,4,9), (22,5,7), (22,6,9), (22,7,8), (22,8,7), (22,9,5),

(23,1,7), (23,2,6), (23,3,5), (23,4,7), (23,5,7), (23,6,6), (23,7,7), (23,8,3), (23,9,8),

(24,1,5), (24,2,5), (24,3,5), (24,4,7), (24,5,8), (24,6,7), (24,7,9), (24,8,6), (24,9,7),

(25,1,7), (25,2,8), (25,3,9), (25,4,5), (25,5,7), (25,6,4), (25,7,4), (25,8,7), (25,9,6),

(26,1,5), (26,2,6), (26,3,7), (26,4,7), (26,5,7), (26,6,7), (26,7,7), (26,8,8), (26,9,7),

(27,1,5), (27,2,5), (27,3,8), (27,4,7), (27,5,7), (27,6,7), (27,7,7), (27,8,7), (27,9,8),

(28,1,7), (28,2,8), (28,3,6), (28,4,6), (28,5,5), (28,6,8), (28,7,7), (28,8,5), (28,9,8),

(29,1,5), (29,2,5), (29,3,6), (29,4,7), (29,5,8), (29,6,9), (29,7,6), (29,8,9), (29,9,8),

(30,1,6), (30,2,7), (30,3,8), (30,4,8), (30,5,9), (30,6,8), (30,7,9), (30,8,8), (30,9,8),

(31,1,6), (31,2,7), (31,3,8), (31,4,10), (31,5,7), (31,6,7), (31,7,9), (31,8,8), (31,9,6),

(32,1,5), (32,2,5), (32,3,8), (32,4,7), (32,5,9), (32,6,7), (32,7,6), (32,8,7), (32,9,5),

(33,1,5), (33,2,5), (33,3,7), (33,4,6), (33,5,8), (33,6,9), (33,7,7), (33,8,7), (33,9,9),

(34,1,7), (34,2,5), (34,3,6), (34,4,7), (34,5,8), (34,6,7), (34,7,10), (34,8,9), (34,9,7);

**courses.sql**

This is .sql file to create the available courses linked to the weights of units table.

INSERT INTO `courses`(`id\_alternative`, `coursecode`, `institution`, `coursename`, `cutoffpoints`, `clustergroup`)

VALUES

(1, 1249107,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE', 43.073, "cluster 12"),

(2, 1249108,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN INDUSTRIAL CHEMISTRY', 41.346, "cluster 7"),

(3, 1249114,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN ANALYTICAL CHEMISTRY', 37.654, "cluster 7"),

(4, 1249115,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN COMPUTER SCIENCE', 44.595, "cluster 9"),

(5, 1249116,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN CIVIL ENGINEERING', 44.625, "cluster 7"),

(6, 1249117,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONIC ENGINEERING',44.361, "cluster 7"),

(7, 1249118,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING', 44.317, "cluster 7"),

(8, 1249133,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF COMMERCE', 41.373, "cluster 2"),

(9, 1249176,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF CONSTRUCTION MANAGEMENT', 42.437, "cluster 8"),

(10, 1249185,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE HORTICULTURE', 34.045,"cluster 17" ),

(11, 1249191,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (FOOD SCIENCE AND NUTRITION)', 36.344, "cluster 17"),

(12, 1249194,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES', 41.649, "cluster 15"),

(13, 1249197,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (TELECOMMUNICATION AND INFORMATION ENGINEERING)', 44.475, "cluster 7"),

(14, 1249208,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY', 42.074, "cluster 9"),

(15, 1249226,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (BIOTECHNOLOGY)', 37.849, "cluster 11"),

(16, 1249231,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (CONTROL AND INSTRUMENTATION)', 40.419, "cluster 7"),

(17, 1249232,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY', 42.126, "cluster 9"),

(18, 1249240,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN MECHATRONIC ENGINEERING', 43.334, "cluster 7"),

(19, 1249244,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF BUSINESS INFORMATION TECHNOLOGY',40.799, "cluster 2"),

(20, 1249247,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE IN SUPPLY CHAIN MANAGEMENT', 36.32, "cluster 2"),

(21, 1249281,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (MEDICAL MICROBIOLOGY)',39.535, "cluster 11"),

(22, 1249350,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (ELECTRONIC AND COMPUTER ENGINEERING)', 43.342, "cluster 7"),

(23, 1249351,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (LAND RESOURCE PLANNING & MANAGEMENT)', 34.48, "cluster 17"),

(24, 1249352,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (FINANCIAL ENGINEERING)', 42.207, "cluster 12"),

(25, 1249353,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF LANDSCAPE ARCHITECTURE', 39.385, "cluster 8"),

(26, 1249354,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (ENVIRONMENTAL HORTICULTURE & LANDSCAPING TECHNOLOGY)', 29.006, "cluster 17"),

(27, 1249421,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (CROP PROTECTION)', 32.538, "cluster 17"),

(28, 1249437,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (BIOCHEMISTRY AND MOLECULAR BIOLOGY)', 39.54, "cluster 11"),

(29, 1249462,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (BOTANY)', 35.699, "cluster 11"),

(30, 1249489,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (WATER AND ENVIRONMENT MANAGEMENT)', 32.341, "cluster 17"),

(31, 1249564,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF ARCHITECTURAL STUDIES/BACHELOR OF ARCHITECTURE', 44.094, "cluster 8"),

(32, 1249580,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (MEDICAL BIOCHEMISTRY)', 34.385, "cluster 11"),

(33, 1249619,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE (GEOMATIC ENGINEERING)', 41.26, "cluster 4"),

(34, 1249728,'JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY','BACHELOR OF SCIENCE INDUSTRIAL BIOTECHNOLOGY', 39.578, "cluster 11");

**criteria.sql**

This is .sql file that stores the candidate score in the criteria form.

CREATE TABLE IF NOT EXISTS moo\_kriteria(

  id\_criteria TINYINT(3) UNSIGNED AUTO\_INCREMENT,

  kriteria VARCHAR(100) NOT NULL,

  type SET('benefit','cost') NOT NULL,

  bobot FLOAT NOT NULL,

  PRIMARY KEY(id\_criteria)

)ENGINE=InnoDB;

INSERT INTO moo\_kriteria(id\_criteria,kriteria,type,bobot)

VALUES

(1,'English','benefit', 0),

(2,'Kiswahili','benefit', 0),

(3,'Mathematics','cost', 0),

(4,'Biology','benefit', 0),

(5,'Chemistry','cost', 0),

(6,'Physics','benefit', 0),

(7,'CRE/IRE','benefit', 0),

(8,'GEO/HIS','benefit', 0),

(9,'Elective','benefit', 0);

/\*Values set to zero since each submission of subject score updates the table\*/

**units.sql**

Due to large number of units for the courses this .sql file was merged together to create the weights table. It is accessible through (GITHUB link: https://raw.githubusercontent.com/LewKM/betterunisqlfile/main/unit.sql).