Report about signals and system web project

Web programming class project 2020/2021

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---This section is intended for the Instructor---------------------------------------

Topic	**Mark**
Project Idea	
Project Complexity	
Project Tools	
Project Requirements and Modeling	
Project Discussion	
Project Completeness	
Project Output Results or reporting	
Project Administration and Management	
Project Report	
Team work	

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Abstract:

In this report, we will talk about our website which helps students to understand the idea of Fourier series theorem using drawing. Additional to this our website offers features to allow teachers to make groups which help them to get the progress of their students in both labs and quizzes and allow them to make quizzes to help them to examine their students.Where students can take quizzes to make sure that they get all the basic information they need.

Introduction:

As students who took the signals and systems course, we noticed that the idea of the Fourier series and Fourier transform was not clear and it was hard to imagine so we wanted to help our colleges to understand the idea behind this two theorems better. So we decided to build a website which helps students to understand the idea in a very simple way, using drawing signals and simple notes which make the idea easier and more fun.

Project requirement:

Every teacher and student who have an account has a unique email, name, and password. Each student belongs to a group and each group has a unique id number. A teacher can make groups to his students.

A quiz is consists of questions- 10 as a maximum- each question has a unique id number, a description, four answers and correct answer number. each quiz has a name and a unique id.

Each teacher can create quizzes.

Each student can take any number of quizzes. For each quiz, he/she takes it has a grade, a maximum grade and data when the quiz is taken. each student can take the quiz as much as he/she likes, but the last attempt's grade will be saved and it's date only.

Each student within or without a group can take the labs on the website and the lab will be marked as taken once the student enters the lab page.

Every teacher can see the progress of his students in labs and their marks in quizzes.

Tools:

1-PHPStorm.

2-XAMP.

3-P5 Library.

4-Bootstrap online library.
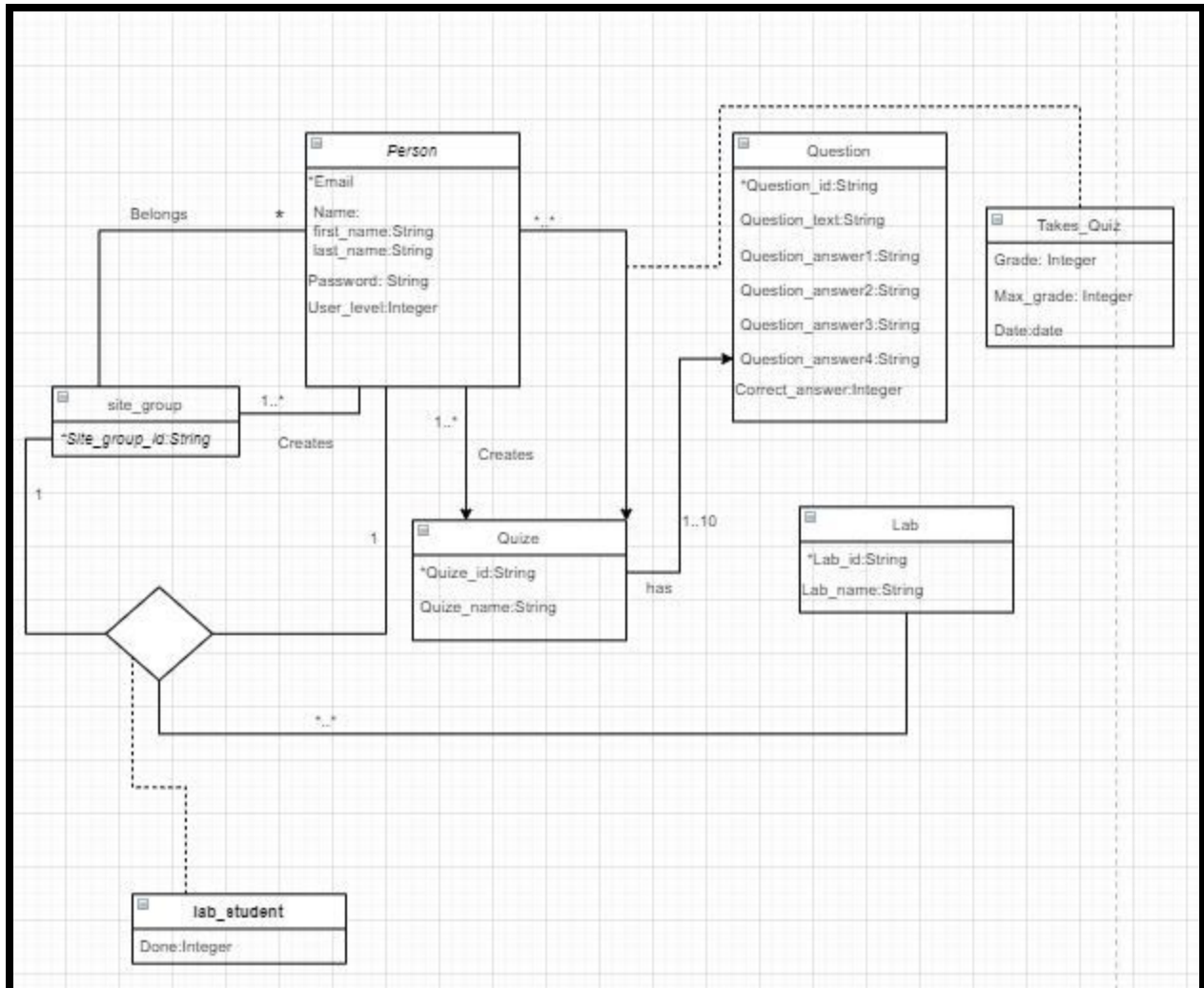
5-Mathjax online library.

6-jQuery online library.

7-Chart.js online library.

8-Google drive.

9-Get waves website. (https://getwaves.io/)
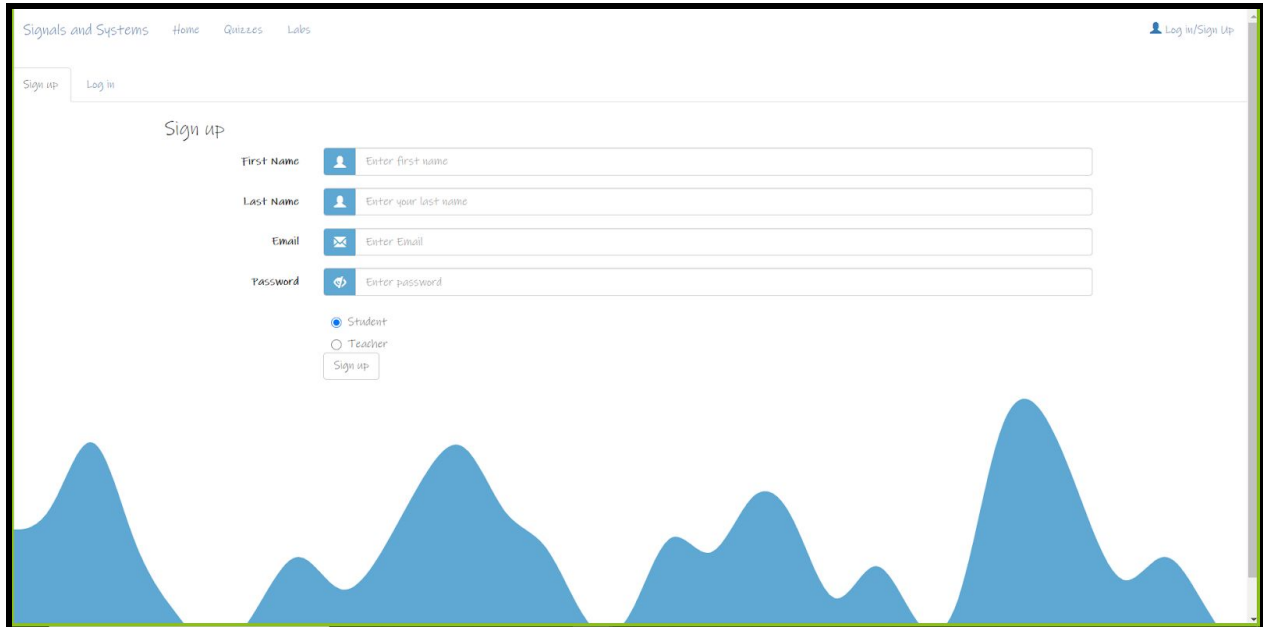
10-Color picker website. (https://coolors.co/palettes/trending)

Database UML:

Person
- *Email
- Name:
  - first_name:String
  - last_name:String
- Password: String
- User_level:Integer

Question
- *Question_id:String
- Question_text:String
- Question_answer1:String
- Question_answer2:String
- Question_answer3:String
- Question_answer4:String
- Correct_answer:Integer

Takes_Quiz
- Grade: Integer
- Max_grade: Integer
- Date:date

site_group
- *Site_group_id:String

Quize
- *Quize_id:String
- Quize_name:String

Lab
- *Lab_id:String
- Lab_name:String

lab_student
- Done:Integer

Belongs   *
Creates   1..*
Creates   1..*
1..10
has
1
1
..
..

4

GUI:

1-Visitor level:

Index page: this is the first page that the user will see when he/she open the website. As you can see we tried to make the website simple and easy to use for the users to give them a perfect using experience. From this page, the user can access the labs, quizzes and can make an account.
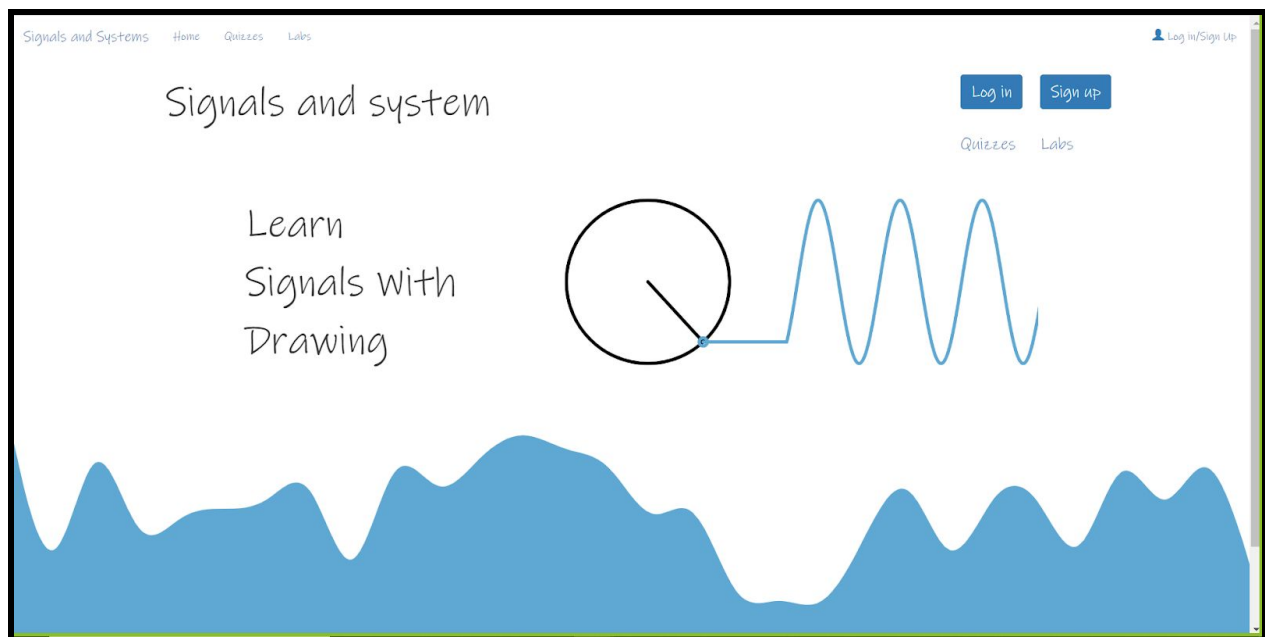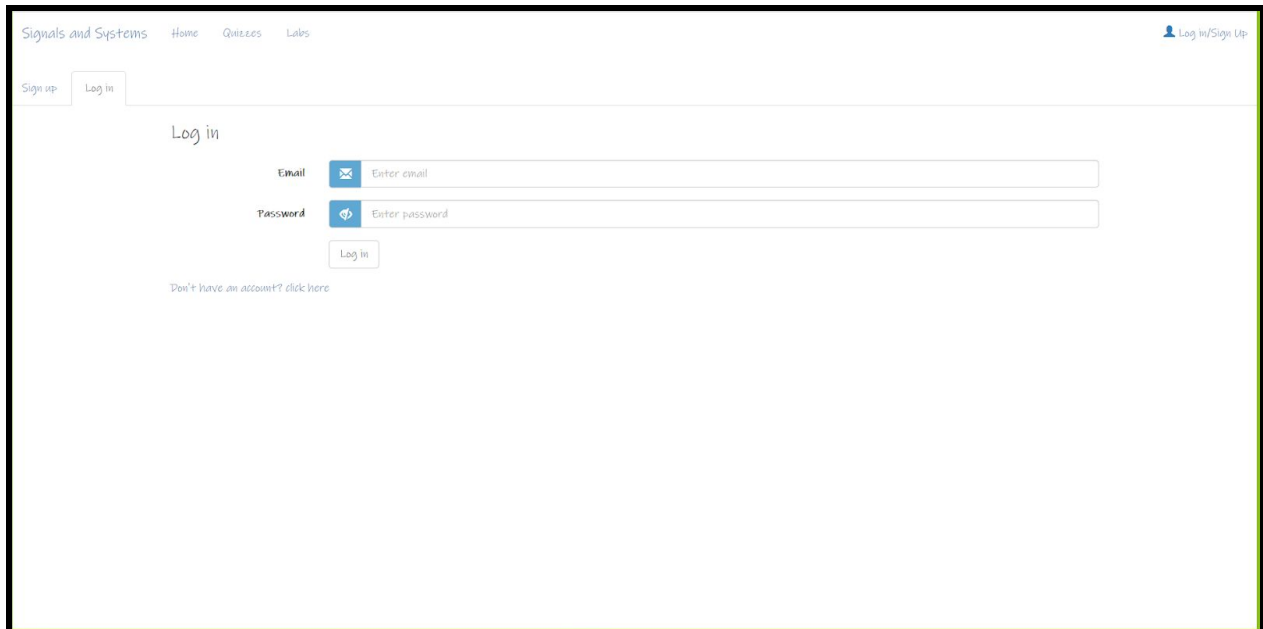
Sign up page: when the user clicks on sign up button he/she will be forwarded to this page which allows him to make an account as a teacher or a student to get the features which introduced by this website.

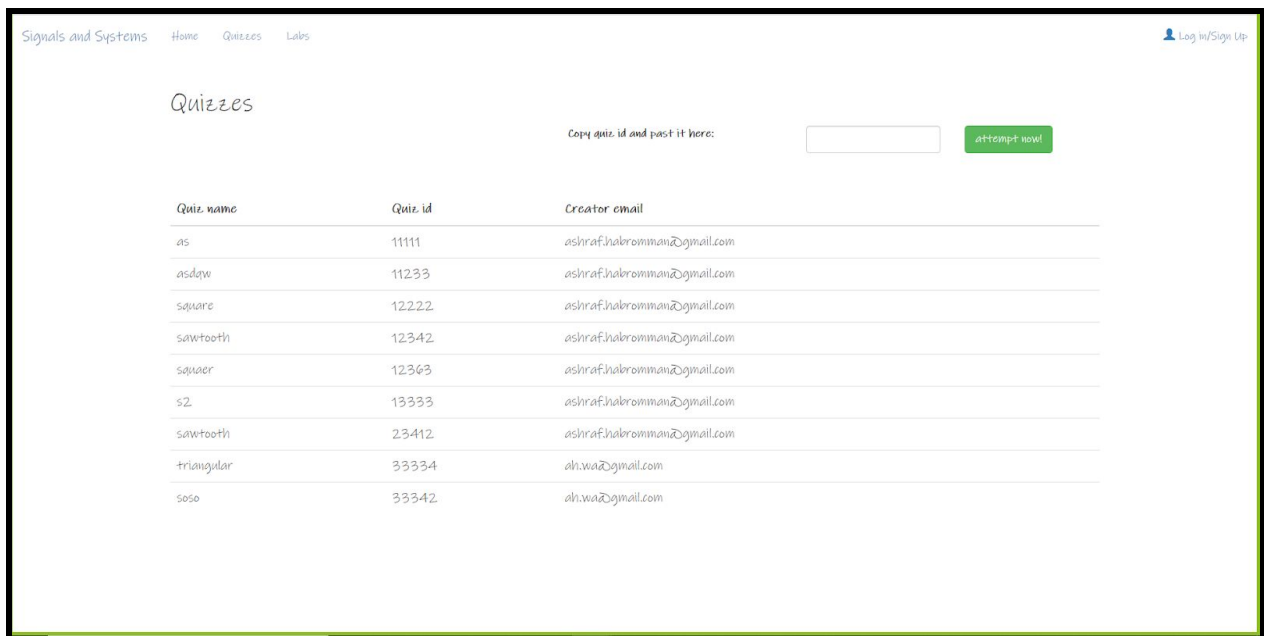Log in page: in this page user can get access to his account using the email that he/she entered in sign up page.
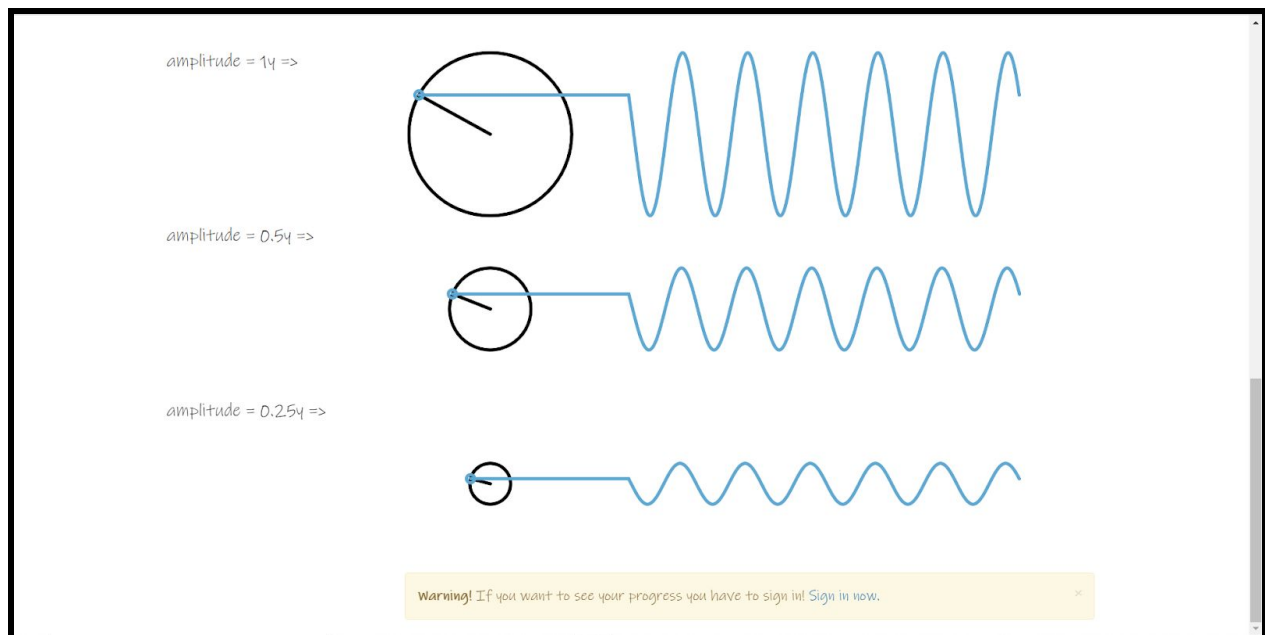
Labs page: this page has all labs in the website and he/she can get access for all of them, noting that his/her progress will not be saved because he/she does not have an account.
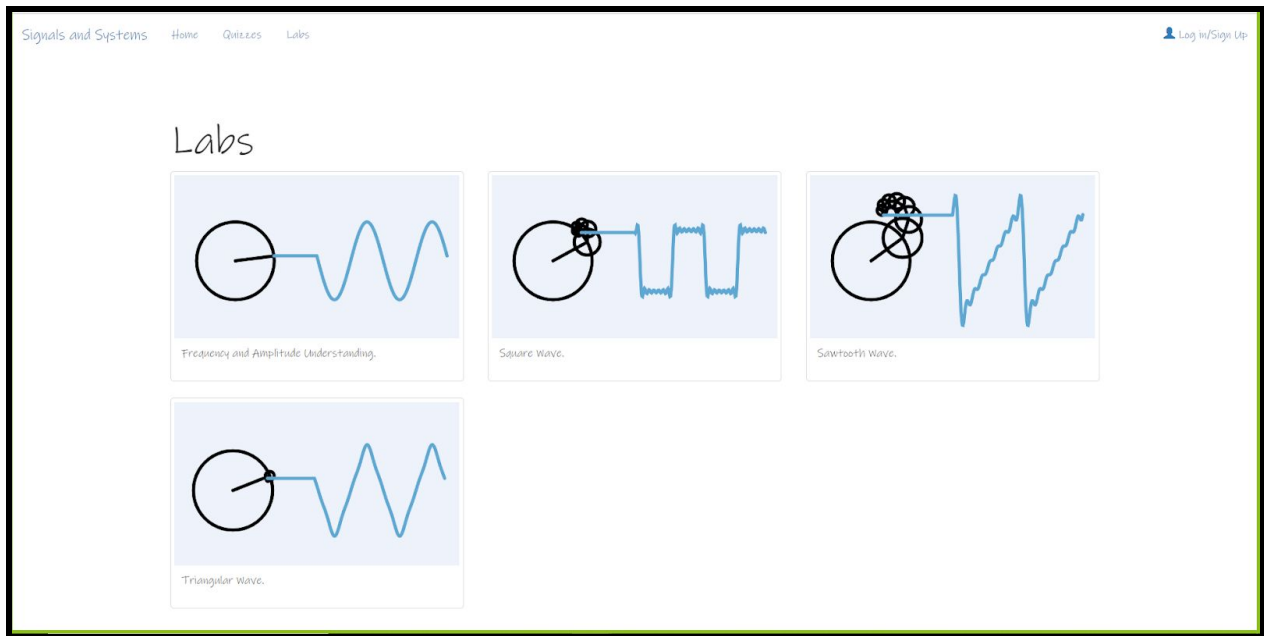
Quizzes page: this page shows all the quizzes on the site, and the user can attempt for any quiz he/she like, noting that his/her progress will not be saved because he/she does not have an account.
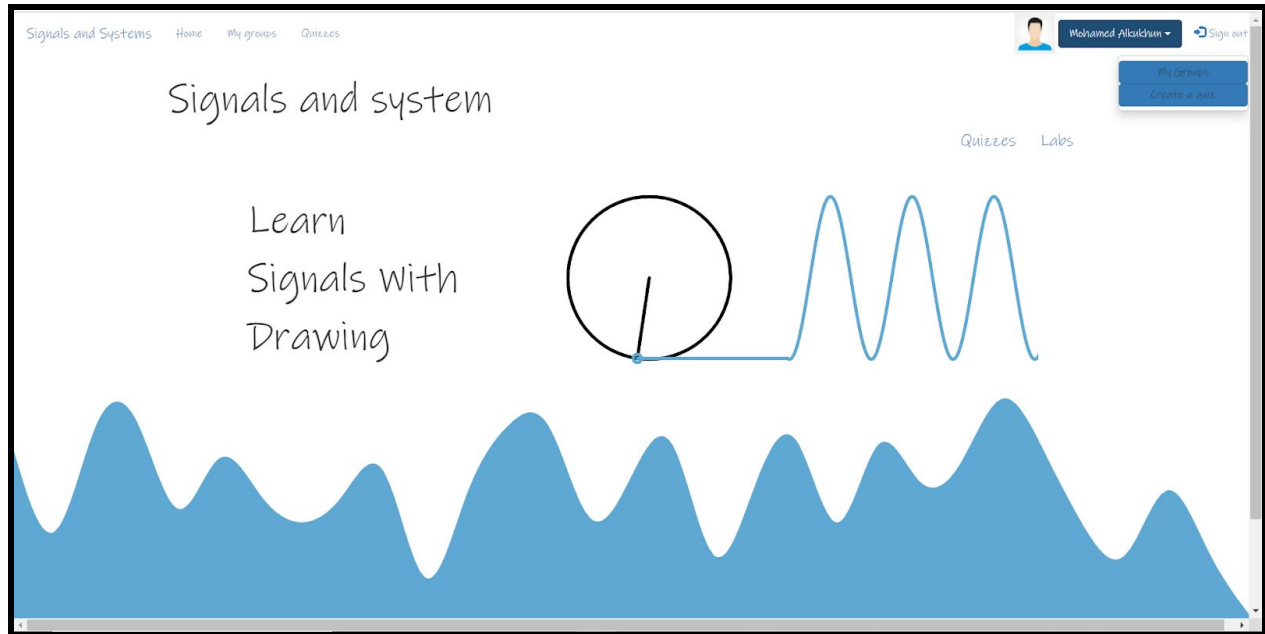
example: when the user tries to access a lab he/she will get this notification.

amplitude = 1y =>

amplitude = 0.5y =>

amplitude = 0.25y =>

Warning! If you want to see your progress you have to sign in! Sign in now.

Teacher Level:

Home page for the teacher: this page allows the teacher to access his/her groups from "My Groups" button and he/she can make a quiz from "Create a quiz" button
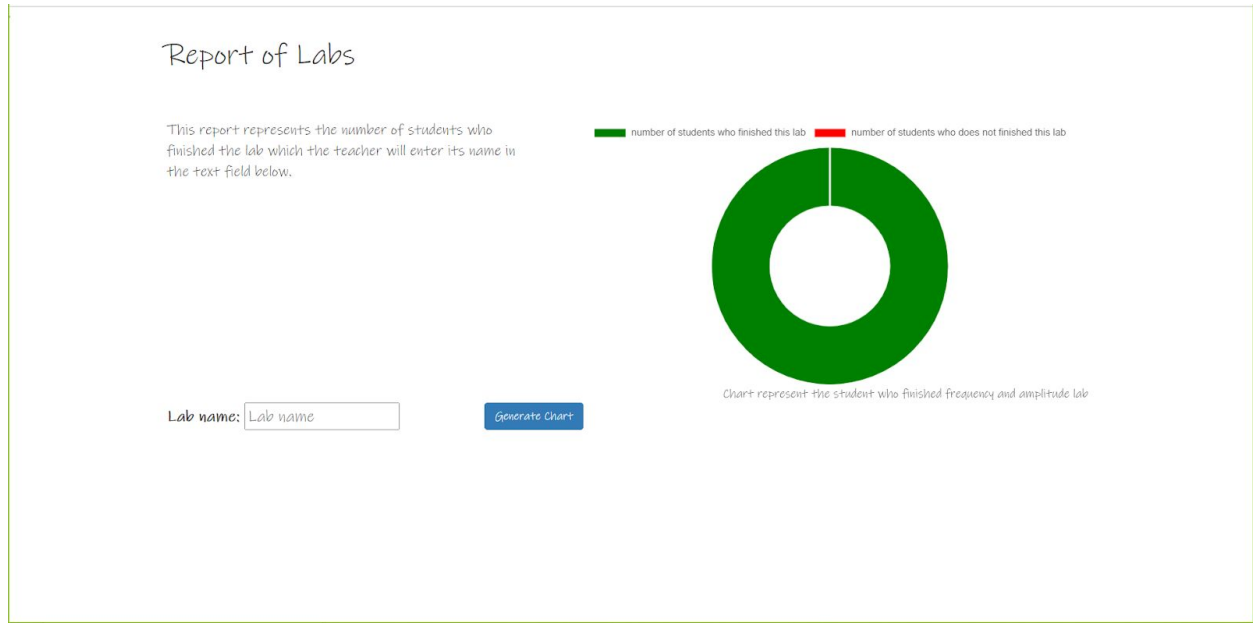

Groups Page: this page allows the teacher to create a group by inserting a group id he/she wants then click on create button.
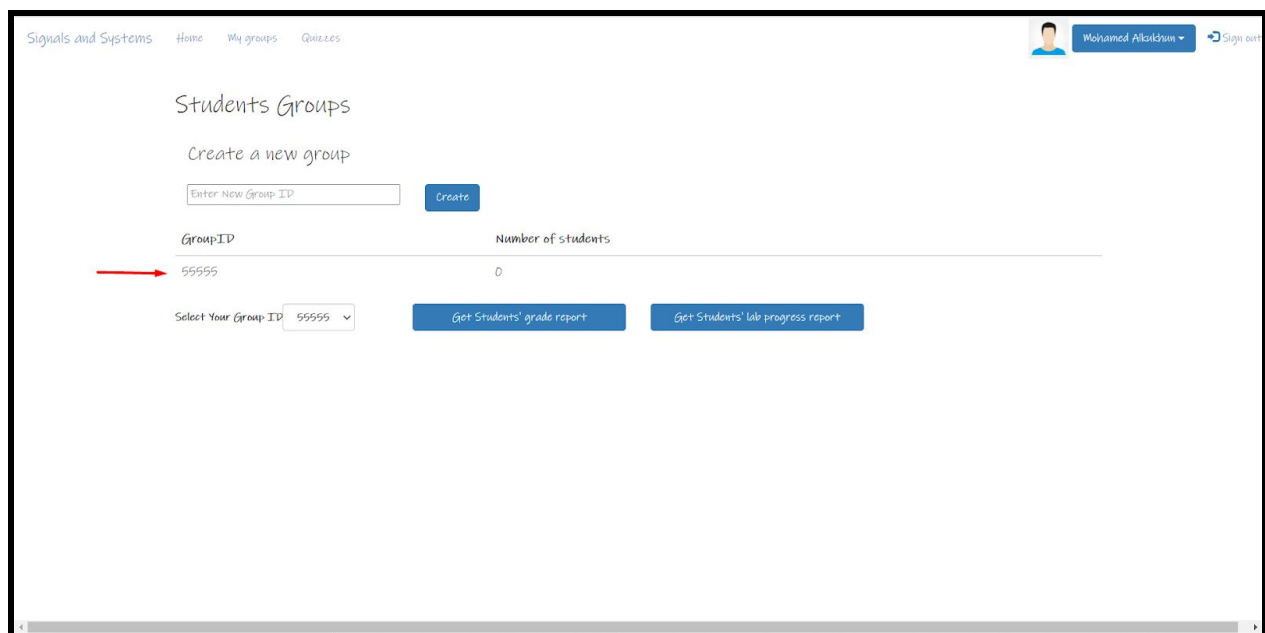
Quizzes report: this chart represents the number of students in a specific group who attempt to a specific quiz (which you can choose from the dropdown menu).
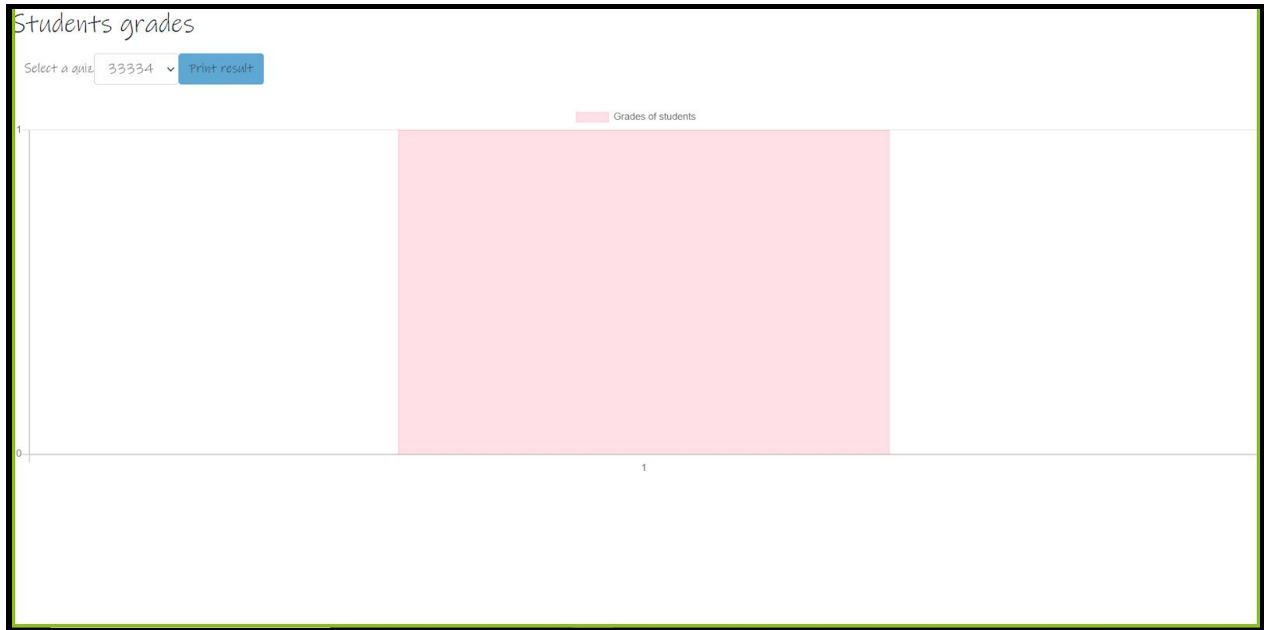
Labs report: this page shows the number of students who took a specific lab(green color) and the number of students who did not take the same lab(red color).

Report of Labs

This report represents the number of students who finished the lab which the teacher will enter its name in the text field below.

number of students who finished this lab   number of students who does not finished this lab

Chart represent the student who finished frequency and amplitude lab

Lab name: [Lab name]   [Generate Chart]

Create a quiz page: from this page, the teacher can add a quiz by insert quiz name and id name, and he/she must add one question as a minimum number by clicking on "Add a question" button and up to ten questions.

Signals and Systems   Home   My groups   Quizzes

Mohamed Alkukhun ▾   ⟲ Sign out

Create a quiz

Quiz name: [circle quiz]

Quiz ID: [1230d]

[Create this Quiz.]

[Add a question.]

after adding a question -as a minimum number- and fill the text area and test fields and choose the correct answer the teacher can create quiz successfully.

Quiz name: circle quize

Quiz ID: 12300

Question '1':

Question description: The circumference of a circle equals to?

○ $4*\pi*r$

○ $\pi*r$

⦿ $2*\pi*r$

○ $\pi*(r^2)$

Create this Quiz.

Add a question.

Student level:

This is the first page that the student will see, it will give him access to Quizzes and labs pages. When he presses his name in the bar this window will be shown, here the student is not signed in any group.
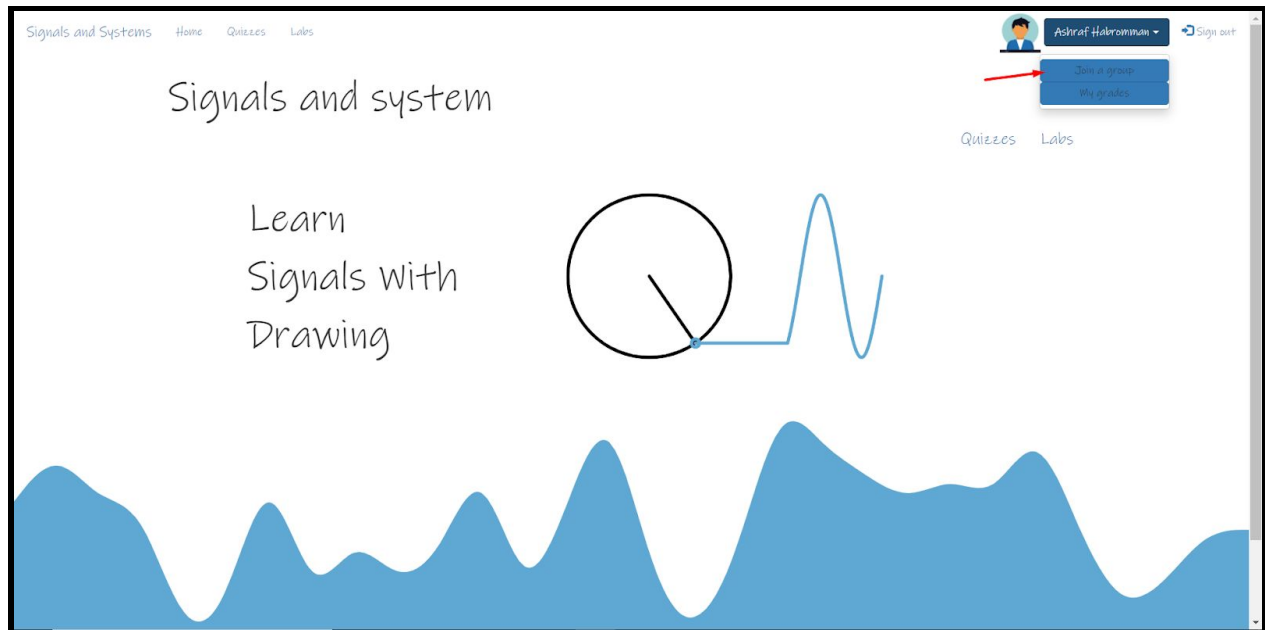
When he/she clicks on join a group a small window will be shown to let him/her enter the group he/she wants to join in it.

After joining in a group the button text will be changed to Your group is (Group ID) as below
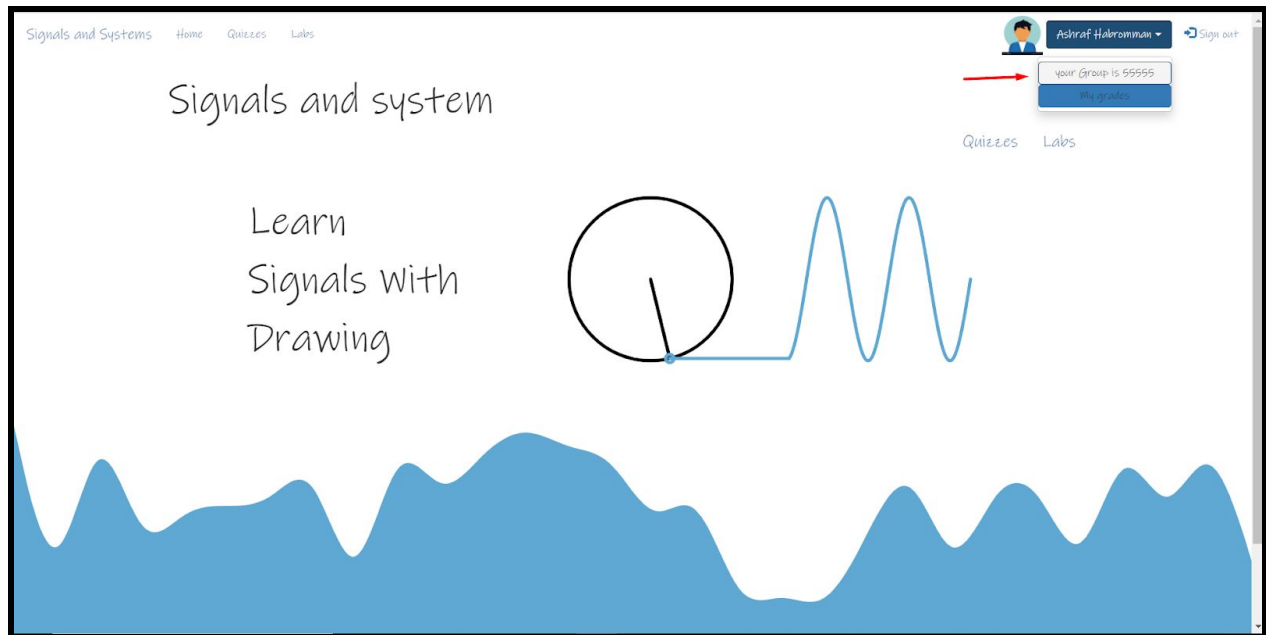
My Grades page: When he/she clicks on my grades this page will be shown, which represents a table of all quizzes he done and their marks

Quizzes page: When he/she clicks on Quizzes page this page will be shown, in this page he can see a list of all available quizzes and he can attempt them by copying the quiz id and paste it in the text box and click submit.

When he/she enters the quiz a list of all questions will be represented and he/she can choose answers, and when he/she finishes he/she clicks in to submit and his grade will be shown to him/her as below.

Labs page: the same labs page will be shown to the student as the visitor but in the bottom of the page he/she will finds a done button to mark this lab as done as follows

from n = 1 to n = 46
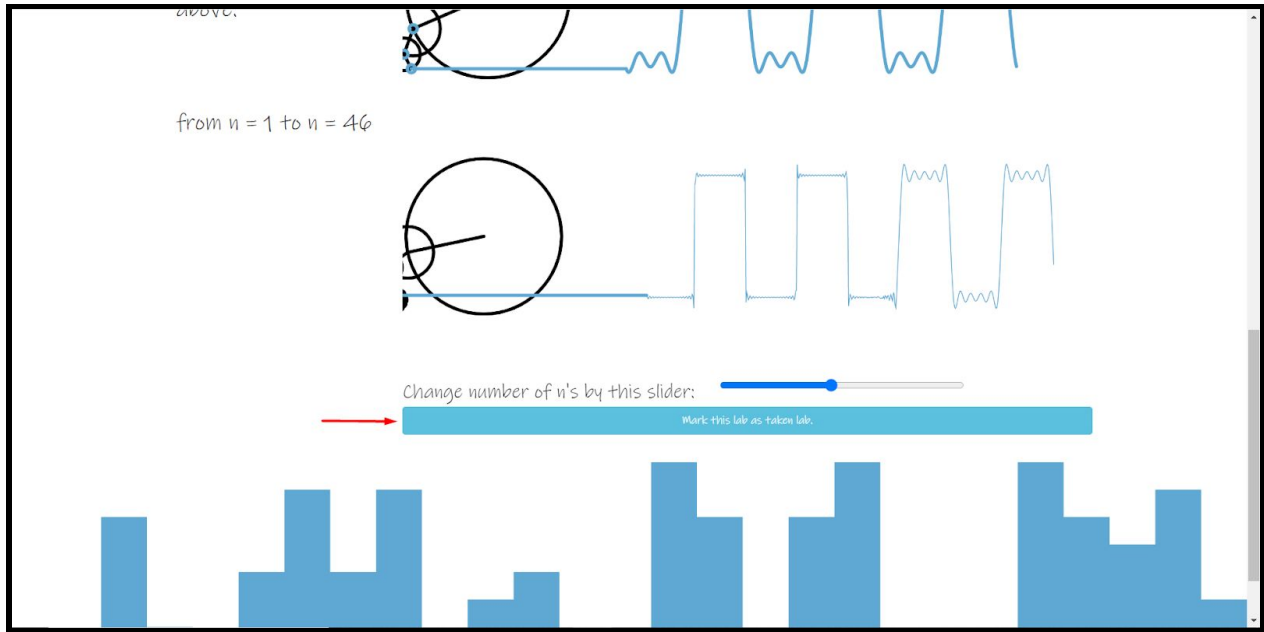
When he/she clicks on it

from n = 1 to n = 46

* Unfortunately this button is not working as it should, there is a bug that changes the lab and marks it as done when he opens it.

Conclusion:

We have learned how to use the bootstrap library which is a powerful tool to arrange the website and make it suitable for diff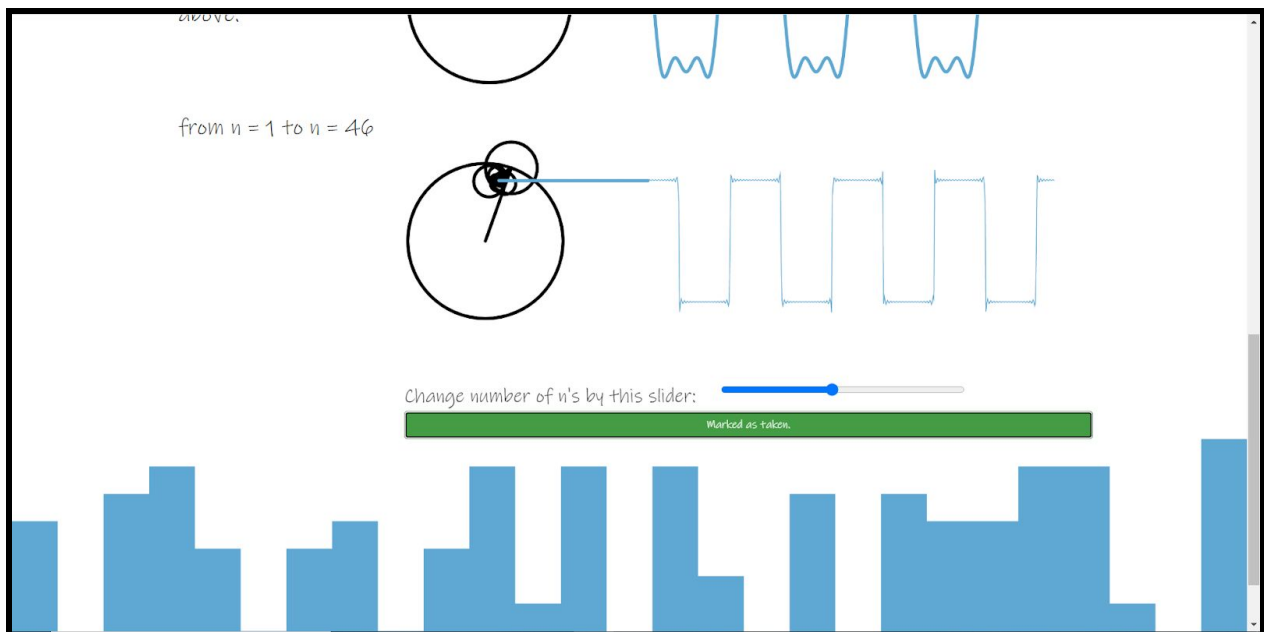erent devices' screens. Also, we have learned how to deal with P5 library which is a library helped us to draw different shapes on our website, especially signals. To help us in drawing and keep the advantages of bootstrap we used "instance mode" in P5 library which is similar to the OOP principle.

We learned how to generate HTML elements using three methods which are PHP, javascript and jQuery.

About backend side, we learned how to manage the database using MySQLi object which allows us to make different queries such as select, insert and update.

For data visualisation, we have used chart.js library which allowed us to represent data in different types of charts like a bar chart and doughnut chart which is a more simple way to represent data than represent it with tables.

For mathematical equations, we used mathjax library which allowed us to write them using a specific notation similar to tags in HTML.

References:

youtube videos:
https://www.youtube.com/watch?v=Mm2eYfj0SgA&t=591s
https://www.youtube.com/watch?v=Su792jEauZg

P5 References:
https://p5js.org/reference/#/p5/draw
https://p5js.org/reference/#p5.Element/parent
https://p5js.org/reference/#/p5/strokeWeight
https://github.com/processing/p5.js/wiki/Global-and-instance-mode
https://stackoverflow.com/questions/55879820/how-to-create-more-than-one-canvas-with-p5

MySQL:
https://dev.mysql.com/doc/

W3Schools:
https://www.w3schools.com/

Bootstrap:
https://getbootstrap.com/