

# E-LEARNING WEB APPLICATION - SMART LEARNING

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**Abstract:** Be delivered for the learner at anywhere, anytime and any age through a wide range of e-learning solution while compared with traditional learning system. Smart-Learning provides the rapid access to specific knowledge and information. With the rapid growth of voluminous information sources and the time constraint the learning methodology has E-learning which fulfils the thirst of knowledge and offers online content. Learners obtain knowledge through e-Learning systems rather than manually teaching and learning. This paper proposes the e-learning web application for social network. This web application supports the cross browser and is fully integrated with database. This system focused around the several features namely content management, learning management, etc., and mainly focused on integrated platform needed for e-learning.

## Theory:

This project is designed with python, tkinter library and TCP sockets.

## What is Python?

Python is an interpreted high-level programming language for general-purpose programming. Python features a dynamic type system and automatic memory management. Python's simple syntax, modules and packages makes it possible for us to develop applications rapidly. Professionally, Python is great for backend web development, data analysis, artificial intelligence, and scientific computing. Many developers have also used Python to build productivity tools, games, and desktop apps.

The syntax of the language is clean and length of the code is relatively short. It's fun to work in Python because it allows you to think about the problem rather than focusing on the syntax. Python's simple, easy to learn syntax emphases

**Index Terms:** Web Application, HTML, CSS, Java-script, Bootstrap, Firebase.

## 1. INTRODUCTION

E-Learning exploits interactive technologies and communication systems to improve the learning experience. It has the potential to transform the way we teach and learn across the board. It can raise standards, and widen participation in lifelong learning. It cannot replace teachers and lecturers, but alongside existing methods it can enhance the quality and reach of their teaching, and reduce the time spent on administration. It can enable every learner to achieve his or her potential, and help to build an educational workforce empowered to change. It makes possible a truly ambitious education system for a future learning society[2][3].

Social networking is used in internet-based social media platforms to stay connected with friends, family, or peers. Marketers use social networking for increasing brand recognition and encouraging brand loyalty. Social media can help connect people and businesses and can help promote brand awareness[1].

Social network course encompasses surprising secrets which have been time and again revealed with the help of tools like graph theory, sociology, game theory etc. The study of these graphs and revelation of their properties with these tools have been termed as Social Network Analysis. Category: Computer Science and Engineering[4].

## 2. WEB DEVELOPMENT

Web development refers to the building, creating, and maintaining of websites. It includes aspects such as web design, web publishing, web programming, and database management. It is the creation of an application that works over the internet i.e. websites[5].

**Web Development can be classified into two parts:**

- Frontend Development
- Backend Development

**A. Frontend Development:** The part of a website that the user interacts directly is termed as front end. It is also referred to as the 'client side' of the application.



Fig. 1. Frontend Roadmap

## HTML

HTML is a hypertext mark-up language. Here is an emerging technology, Cascading Style Sheets, which can eliminate much of the HTML table that can be used to control the layout of a web page. A web designer can separate the header, body, and sidebar sections of a web page by placing each section in a separate cell. Alternatively, the network designer can put each link button on the header and sidebar in a separate cell so that he can set unique attributes for each button. Then, in the body of the page, the network designer can separate the text and graphic elements into different cells to adjust spacing and other properties individually[5].

## CSS

CSS can be a formatting language to which you want to add style to your page. This can be done by having the associated CSS document in your html page. The page then has selectors and attributes that affect the tags inside your html document. CSS was introduced in 1996. It was created to prevent people from having to repeat a lot of code[5].

## JavaScript

JavaScript is a powerful client-side scripting language. JavaScript is mainly used to enhance user interaction with the website. In other words, you can make your web content more relatable and interactive with the help of JavaScript. JavaScript is increasingly widely used in game development and mobile application development[5].

## Bootstrap

Bootstrap is a free and open-source tool collection for creating responsive websites and web applications. It is the most popular CSS framework for developing responsive, mobile-first websites. Nowadays, the websites are perfect for all the browsers (IE, Firefox, and Chrome) and for all sizes of screens (Desktop, Tablets and Phones)[5].

**B.Backend Development:** Backend is the server side of a website. It is the part of the website that users cannot see and interact. It is the portion of software that does not come in direct contact with the users. It is used to store and manipulate data[5].

## Firestore

Firestore is a Backend-as-a-Service (BaaS) app development platform that provides hosted backend services such as a real-time database, cloud storage, authentication, crash reporting, machine learning, remote configuration, and hosting for your static files[8].

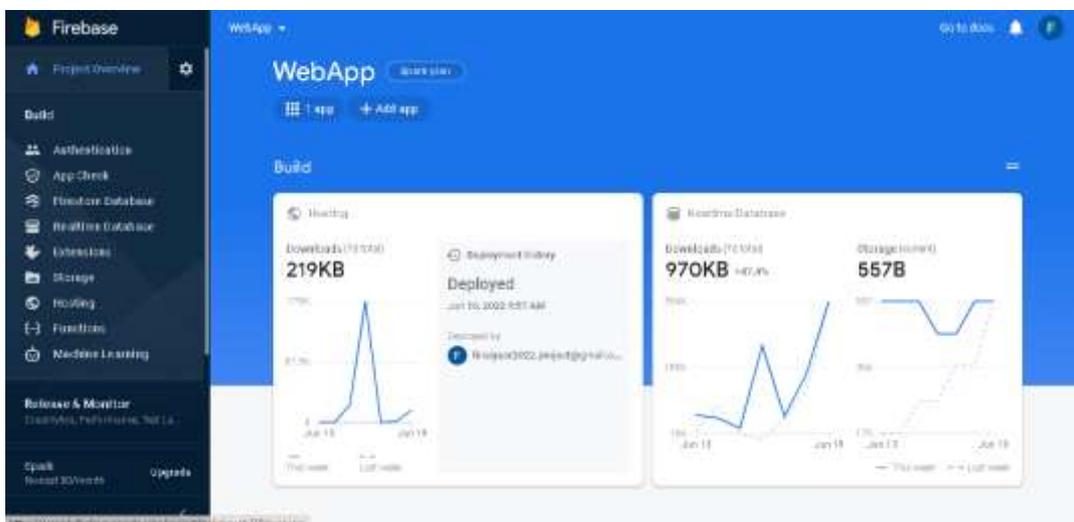


Fig. 2. Firebase Services



- Course Pages
- Graph Visualization using Replit

**Home Page:**

This page is the starting page of our web application. User can view the details and use of application. It contains the link to login/register the user on our website.

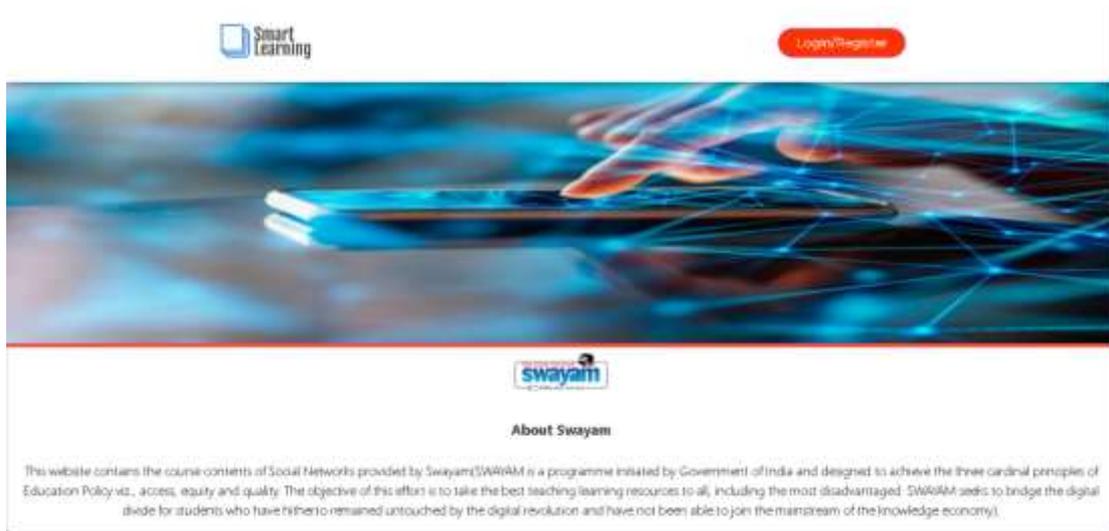


Fig. 5. Home Page

**Login/Register Page:**

**Login:**

This is the login view of page where registered user can log in using username and password.

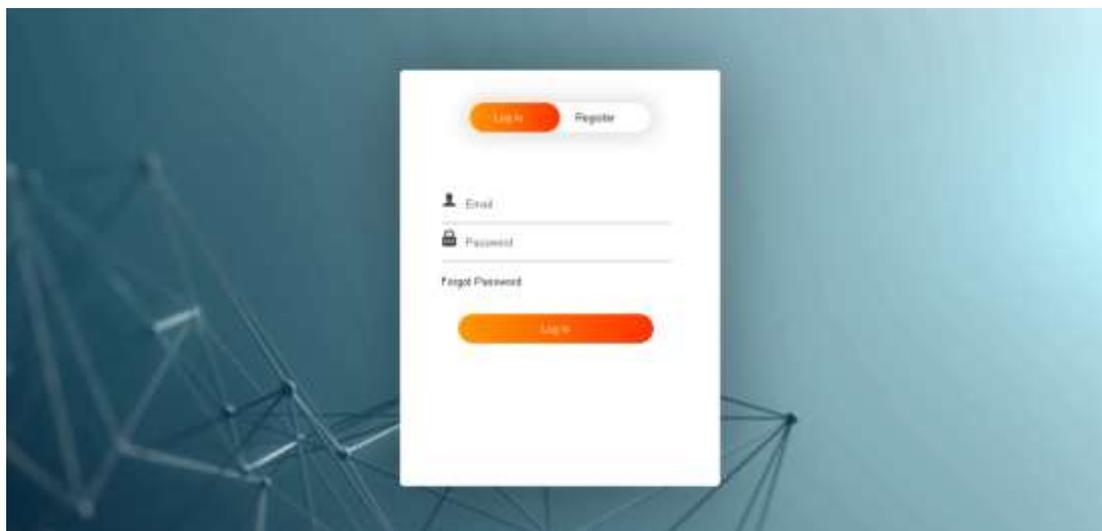


Fig. 6. Login View

**Register:**

This is register view of page where the user need to enter the details like Name, Email address and Password to register.

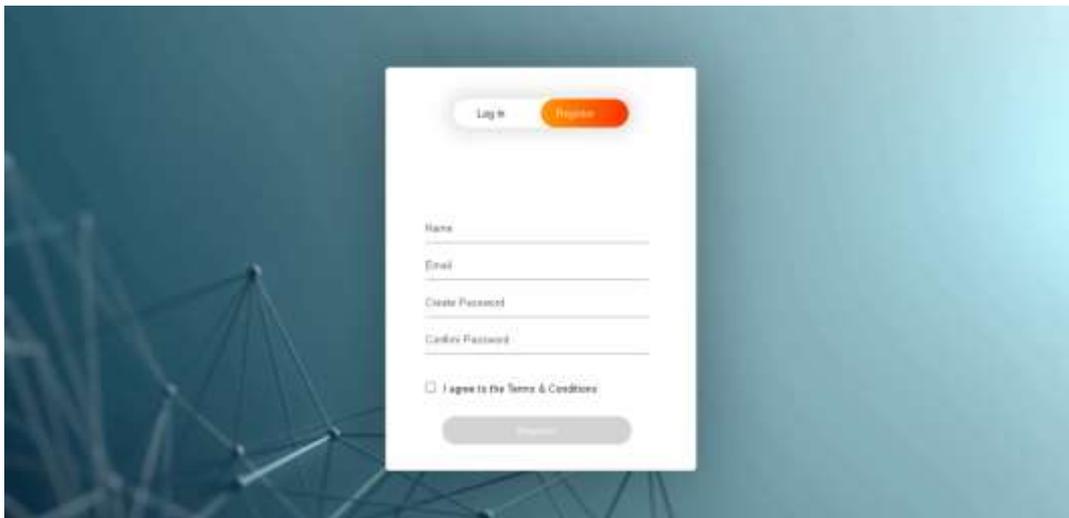


Fig. 7. Register View

**Course Page Reference:**

This is introductory page where user can view various functions available for them to grasp to contents effectively. This page recommends user to navigate to Course Page.



Fig.8. Course Page Reference

**Course Pages:**

It contains the introduction video with the links to every single topic of the course on Social Networks. The contents are organized in the form of 12-weeks course available on Swayam platform. All the videos available on our website are taken from the Swayam Platform. From this page user can jump to any topic of the course but it is recommended to learn every topic sequentially to have a better understanding of the course. Every topic page contains the information regarding particular topic in the form of text notes and video lectures. If user wants to redirect to features page, they can use the Logo and if they want to leave the website, they can use Logout button available on every web page. Application contains a unique button, “Try it Yourself” to visualize theory knowledge with the help of Graphs. After clicking the button, the user will be redirected to the Replit interface to run the code. From Replit interface user can access both code as well as output.



Fig.9. Course Page 1



Fig. 10. Course Page 2

### Graph Visualization using Replit

Social network analysis is the process of investigating social structures through the use of networks and graph theory. It characterizes networked structures in terms of nodes and the ties, edges, or links that connect them. We can understand the concepts of Social Networks in better way by visualizing real world Networks practically[1]. **Replit** is a simple yet powerful online IDE, Editor, Compiler, Interpreter, and REPL(Read-Evaluate-Print-Loop). Replit is a coding platform that lets you write code and host apps. It also has many educational features built-in, making it great for teachers and learners too. Every repl you create is a fully functional development and production environment.

When user clicks on “Try it Yourself” button on our website, they are redirected to Replit interface where they can access the python code for a particular topic and run it to visualize the output[7].

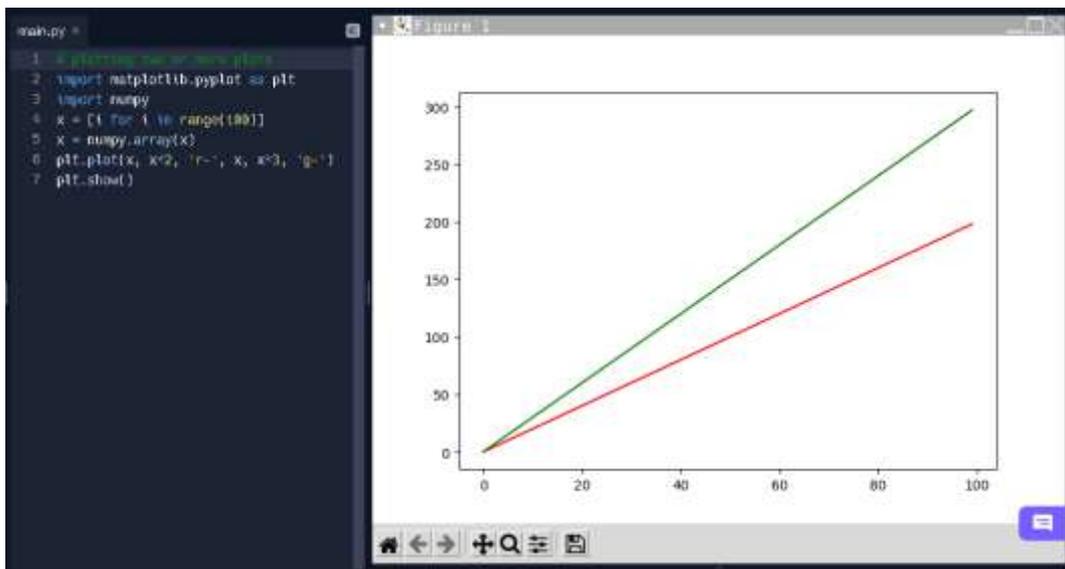


Fig. 11. Plotting two or more plots

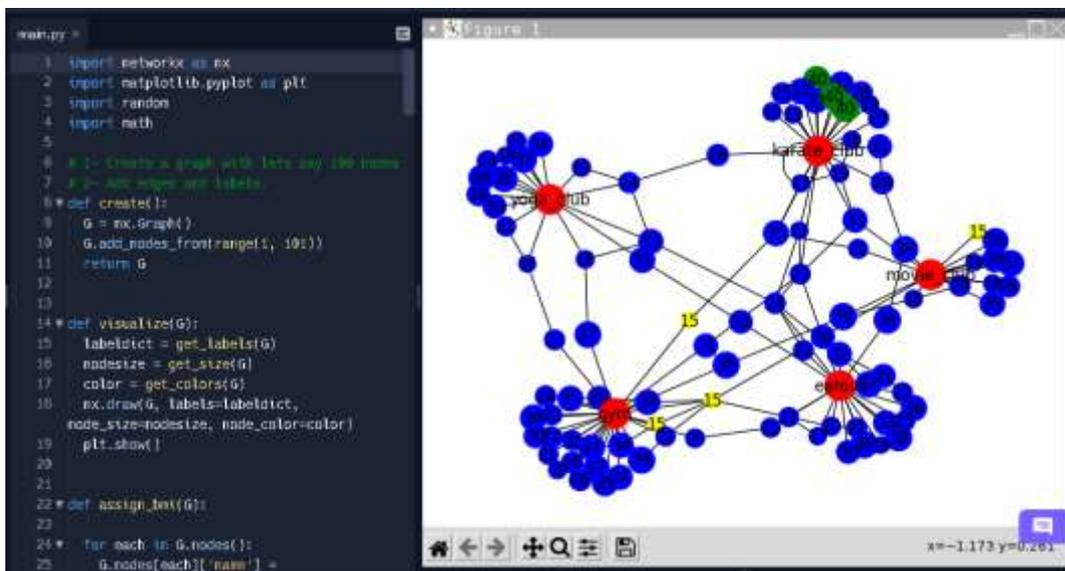


Fig. 12. Implementing Homophily

#### 4. FUTURE SCOPE

Currently the website is created for learners to learn the subject Social Networks available on Swayam Platform with the help of codes and outputs that are visualized on Replit. In upcoming time, we will work on more such subjects which requires hands on practice to understand the concept deeply. Adding more such subjects will help users acquire knowledge of particular subject while practicing the codes at the same time using Replit.

#### 5. CONCLUSION

Smart-Learning website is a fully pledged working website right from the user authentication, authorization, access to course contents and executing the code examples in the course. The main advantage of these application is user can run the codes and visualize the outputs of various networks using online compiler which will help them develop practical knowledge of the concepts learned from notes and video lectures of Swayam course on Social Networks. Also user will have unlimited access to the contents of these course once they are registered on the website for free. The basic purpose of the application is to provide user practical knowledge of subject- Social Networks along with notes and video lectures.

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