

## BROWSER BASED CODE EDITOR

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**Abstract:** Online Compiler and code editor's main objective is to implement Code without installing compiler in the system, directly the code can be compiled and run. An online compiler has the same basic functionality as a conventional compiler, however with one significant difference: all of a project or application's source code is stored and executed online via a web browser. Thus, we aim to develop a website where users can write C code and paste into the C-code editor and compiler and then press the run button. The system will send information to server where compiler is installed and it will test the code at server side and send result information to client within a few seconds. So, this application will save time in installing the entire C compiler with DOS which is a time taking process. Therefore, people can directly use this online compiler which is a fast and straightforward method.

**Keywords:** Online Compiler and editor, React.js, Firebase, etc.

### 1. INTRODUCTION

Online compilers are tools which allows you to compile source code and execute it online in your desired programming language. The first compiler was written by Grace Hopper, in 1952, for the A-0 programming language [1]

By Storing and executing source code online, browser-based code editor and compiler significantly reduces both the hardware and the software required by programmers when working on any given project, it allows programmers and development teams to quickly begin projects for a wide range of platforms, devices, and operating systems. Some famous online compilers are Codechef, codepad. The generally accepted working of our website would be that the users can write or copy paste a C-code in the Code editor and then use the submit button which will compile the program in the backend and show the result in the output window. In addition to this, users can also add files which can be compiled using the gcc compiler in the backend.

We made sure that website has optimum privacy and security for its users. Our main purpose was to authenticate users with their email addresses and passwords. The Firebase Authentication SDK provides methods to create and manage users that use their email addresses and passwords to sign in. It also handles sending password reset emails. By this, we can make sure that only active users can log in to their accounts.

Allowing the users to download, upload and share the files are some of the perks of our website. The website provides with a dark mode theme which helps the user to easily read the content in the screen and also save battery on some screen. The users have the privilege to create many sub-folders within a folder. A user can have access to all the previously created C files if it is saved by the user.

The user can reset password via Email, the user will receive a link in their given inbox which redirects to a page where they can reset their password.

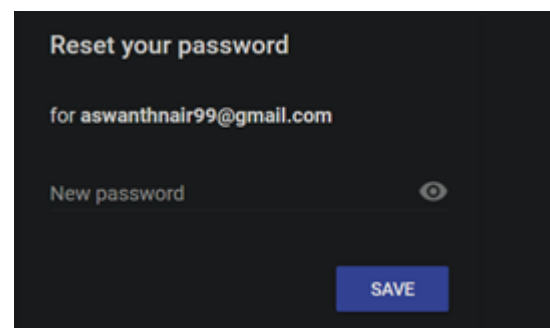


Fig. 1 Password reset email

### 2. SURVEY METHODOLOGY

Our first approach towards making of Online C code editor was to collect information from the people who are actually going to use our application. So, we decided that before implementing our C code editor website we should first ask opinions from the people who will be using the website. Our application would mostly be used by students, so we decided to gather responses from concerned students of varying age

group. This gave us the direction to develop our code editor website.

Our survey was quite simple and the user only had to fill up a google form with five questions regarding spanning usage, User Interface, User Benefits, and User preference between online compilers and traditional approach. The questionnaire are as follows:

1. How frequent would you use an online compiler?
2. How satisfied are you with the UI of online compilers?
3. What benefits do you think online compilers offer?
4. Do you find the option to add files in an online compiler useful?
5. How far you would like to use online editor and compilers rather than using traditional approach to compile any program?

### 3. DEMOGRAPHICS OF RESPONSES

The responses had 106 participants. The majority of the responses are from students and individuals of age group 18-24 years. The responses included both males and females. These responses helped us to begin with our code editor and compiler website.

#### 3.1RESPONSES

1. How frequent would you use an online compiler?

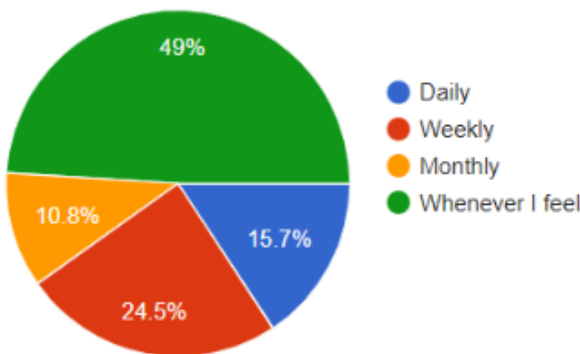


Fig. 2 Frequency (Pie Chart)

2. How satisfied are you with the UI of online compilers?

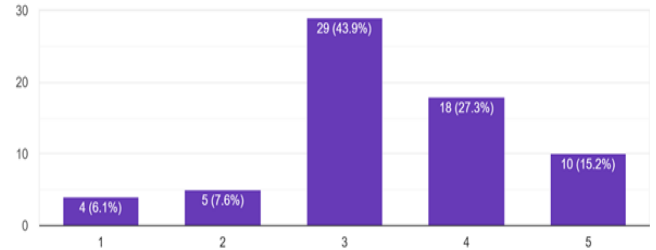


Fig. 3 U.I Satisfaction (Bar Graph)

3. What benefits do you think online compilers offer?

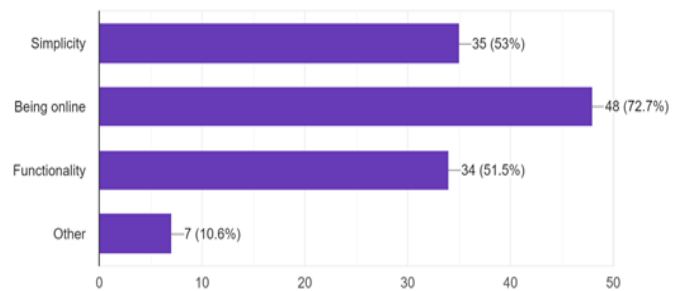


Fig. 4 Benefits (Bar Graph)

4. Do you find the option to add files in an online compiler useful?

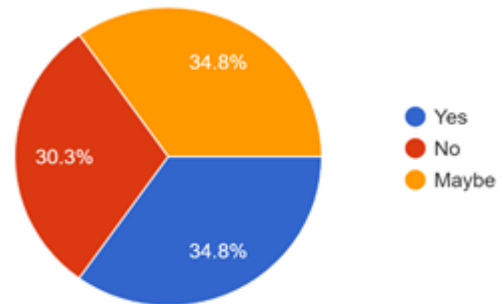


Fig. 5 Files (Pie Chart)

5. How far you would like to use online editor and compilers rather than using traditional approach to compile any program?

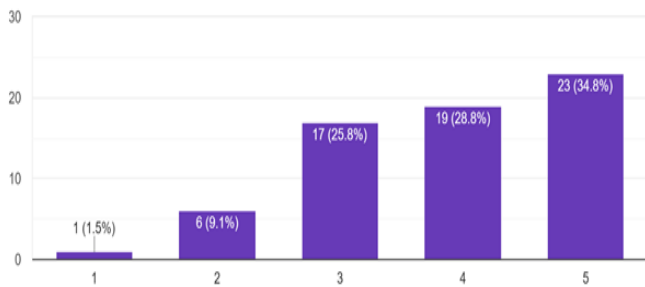


Fig. 6 (Bar Graph)

#### 4. DISCUSSION

The identified two issues that the current code editor/compiler website has through this survey and by exploring the website ourselves.

They are namely:

##### 4.1 Non-user-friendly design

Currently, the UI implemented by similar websites is complex and not very user-friendly. There is no user control over the website. A majority of users in our survey suggested that they would like to have a some control over UI for using the site than the existing one.

The issue was solved as follows:

1. By keeping UI simple, visible buttons for all function and added editor themes.

##### 4.2 NO CLOUD SAVES:

On the current websites the user is not able to save their files or projects online which defeats the purpose of an all-online code editor and compiler.

The issue was solved as follows:

1. Implementing cloud saves where all users can save their files in our cloud storage.
2. The website also saves all projects, also the layout and project directory workspace are maintained by user.

#### 5. TECHNOLOGY STACK

##### Node.js:

Node.js framework has been used as the main

framework for creating the website. Node.js is a server-side platform built on google Chrome's JavaScript Engine [2]. The compiler server is made with node.js, express and axios module.

Some of the services provided by Node.js are as follows:

1. It provides a faster execution.
2. Node.js applications do not buffer data. Node.js applications give output data in chunks.
3. Any API used in node.js library is asynchronous.

##### Firestore:

Firestore is Google's platform that can help create high quality apps and some of the features are as follows:

1. Cloud Firestore i.e., their collections-based database.
2. Firebase Authentication includes native authentication directly and OAuth2 authentication via google Facebook.
3. Realtime database which can allow directly from client-side code.
4. Firebase Hosting allows you to direct deploy your site to cloud.

##### React.js:

React allows user to create reusable and good-looking components, which can be used again. Using this component for creating pages for each state in your application, and React will efficiently update and render just when your data or state changes.

Some of the key features of React are as follows:

1. Declarative views make your code more predictable and easier to debug.
2. Since component logic is written in JavaScript instead of templates, you can easily pass rich data through your app and keep the state out of the DOM.

#### 6. SCREENSHOTS

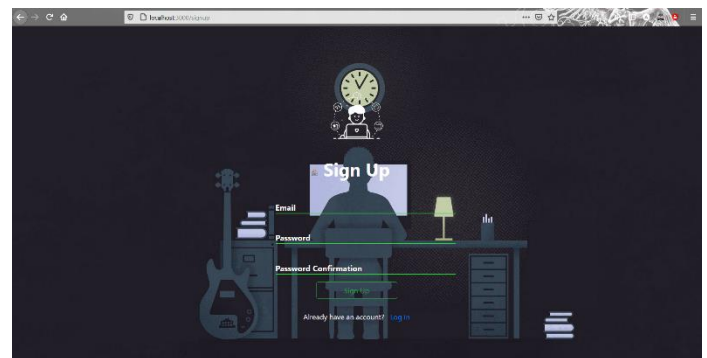


Fig.7 Registration

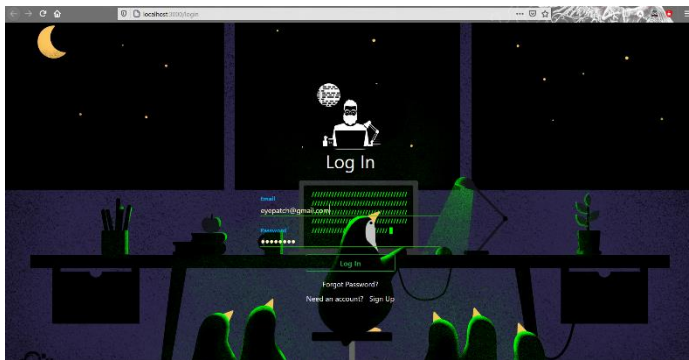


Fig. 8 Login

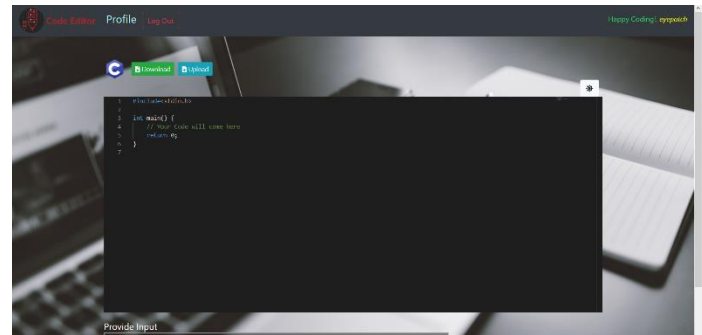


Fig.12 Dark Mode

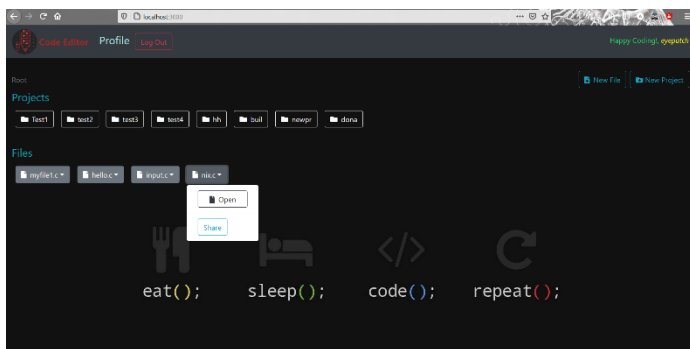


Fig. 9 Root Folder

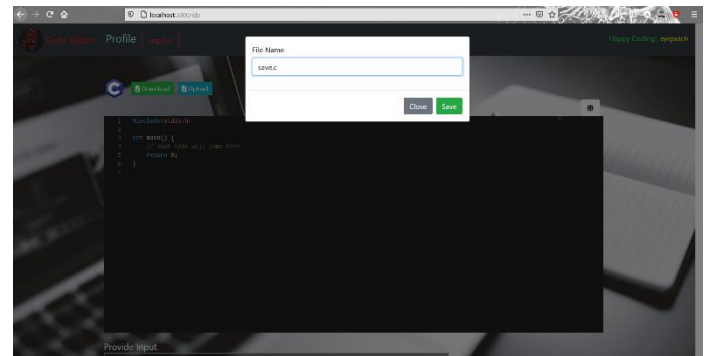


Fig.13 Upload File

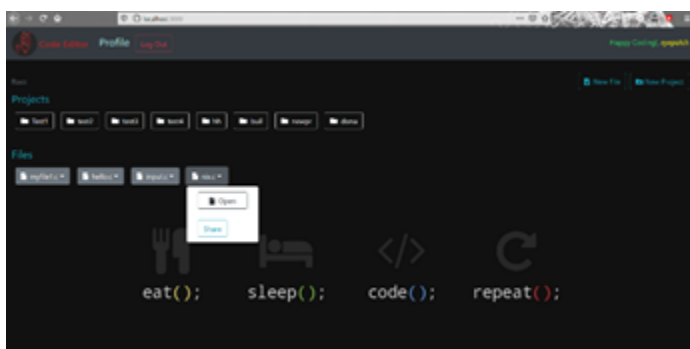


Fig.10 Open and Share files

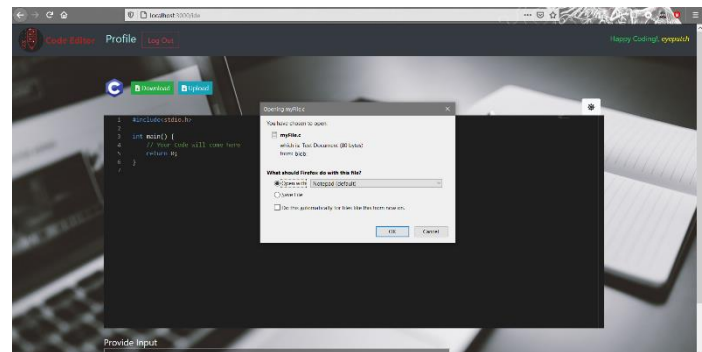


Fig.14 Download File

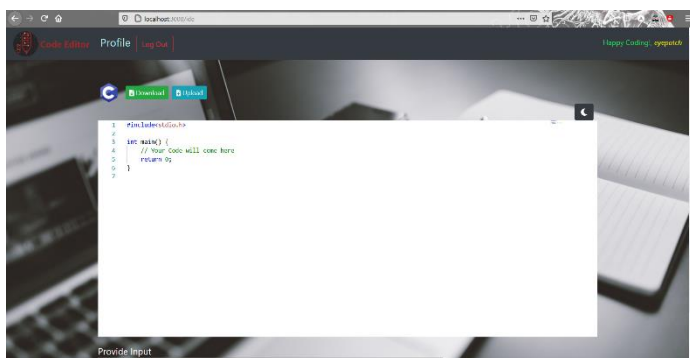


Fig.11 Code Editor

## 7. CONCLUSION

Most of today's online editors /compilers only provide the bare minimum of compiling or editing code but not a workspace where you can actually save your work completely online. Our efforts try to achieve that by saving user's files, projects fully online which can also be shared with just a link still keeping the UI straightforward and simple.

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