



Dharmsinh Desai University, Nadiad
Faculty of Technology, Department of Computer Engineering

B.Tech. CE Semester - VI
Subject : System Design Practice (SDP)

Project Title:

Decoder

Submitted By :

| Name | Roll No. | Id |
|-----------------------------|--------------|-------------------|
| Gheewala Dhruv A. | CE044 | 18CEUBS079 |
| Govindvira Dhiraj G. | CE048 | 18CEUOG133 |
| Pandya Kushal P. | CE067 | 18CEUOS125 |

Guided By :

Prof. Siddharth P. Shah

Associate Professor, CE Dept.
Dharmsinh Desai University



Dharmsinh Desai University, Nadiad
Faculty of Technology, Department of Computer Engineering

CERTIFICATE

This is to certify that the practical / term work carried out in the subject of
SDP, and recorded in this journal is the project entitled “Decoder” is the
bonafide report of work carried out by

| | | |
|-----------------------------|--------------|-------------------|
| Gheewala Dhruv A. | CE044 | 18CEUBS079 |
| Govindvira Dhiraj G. | CE048 | 18CEUOG133 |
| Pandya Kushal P. | CE067 | 18CEUOS125 |

Of the Department of Computer Engineering, Semester VI, academic year
2020-21, under our supervision and guidance.

Guide

Prof. Shidharth P. Shah

Associate Professor
Dept. of Computer Engg.
Faculty of Technology
Dharmsinh Desai University, Nadiad

HOD

Dr. C. K. Bhensdadia

Head,
Dept. of Computer Engg.
Faculty of Technology
Dharmsinh Desai University,
Nadiad

Table of Contents

| No. | Content | Page No. |
|-----|-------------------------------------|----------|
| 01. | Abstract | 04 |
| 02. | Introduction | 04 |
| 03. | Software Requirement Specifications | 05 |
| 04. | Analysis and Design | 10 |
| 05. | Implementation Detail | 17 |
| 06. | Testing | 18 |
| 07. | Screenshots | 19 |
| 08. | Conclusion | 23 |
| 09. | Future Extensions | 23 |
| 10. | References | 23 |

1. Abstract

Decoder is software that provides all help, tools and information related to competitive programming at the same place. Decoder contains an online compiler for some of the languages. Users can also ask questions related to coding(Basically somewhat like Discussion Form). Users can also get the data regarding upcoming contests of various platforms like Codechef, Codeforces, Leetcode, etc...

2. Introduction

Decoder platform is created for competitive programmers, and the good performance in programming contests are most valuable to any competitive programmer. Mostly all of the competitive programming platforms held their contest online and at some specific country time.

There are a lot of programming platforms out there each with their own contest, for one programmer it's hard to keep a map of every contest date, time and duration. This project will help them to see all the contest information at a single place.

Also, sometimes programmers do not have their own laptop with them and want to participate in a contest then they can simply use a compiler built in our website and compile/run their code. Our platform will guarantee that the code is never shared with anyone and there won't be any scenario of them being caught in plagiarism by using the over system.

Competitive programming is a sport and for any sport to grow a good a community platform is necessary because it helps them share new ideas and ask for any doubt/solution in problem. Our platform will provide this discussion forum. There are few websites who have started building platforms like this for programmers, and our survey says that most of them are primarily built for any programmer.

This software will also utilise APIs provided by some known competitive programming platforms to fetch the details about upcoming contests. Decoder also has a discussion forum to discuss topics related to competitive programming. Users can ask doubts regarding any topics and other users can comment and reply.

3. Software Requirement Specifications

System Feature

Decoder site provides services to compiler and run code online for free and also ask doubts with other people using discussion forums.

1. Discussion Forum:

| | |
|-------------|--|
| Input | Navigate to that page |
| Description | Can see list of doubts raised by various users of our system |

2. Doubt Finder:

| | |
|--------------|--|
| Input | Title of the desired doubt |
| Output | Redirection according to success or failure |
| Description | You can find a specific doubt or doubts written by specific user |
| Process | search based on user query and show matching blogs. |
| Precondition | There is no need to log in to as blogs must be available to all users. |

3. Login:

| | |
|--------------|---|
| Input | username(or email) and password |
| Output | Redirection according to success or failure |
| Description | User can log into system to get additional features and save his/her data regarding to system |
| Process | Validates the given credentials |
| Precondition | User should have an account to login |

4. Registration:

| | |
|-------------|--|
| Input | Credentials of the user as asked |
| Output | Redirection according to success or failure |
| Description | Registers an account |
| Process | Credentials validation. If validation is successful then account is registered into the system |

5. Ask a Doubt:

| | |
|---------------|---|
| Input | Required data related to doubt like title, description, etc... |
| Output | Redirection according to success or failure |
| Description | To ask a new doubt to get help from the community |
| Process | Data validation |
| Precondition | Should be authenticated into the system |
| Postcondition | If 'Process' is successful then doubt will be added in the system |

6. Update the doubt:

| | |
|--------------|---|
| Input | Data to be updated for a particular doubt |
| Output | Redirection according to success or failure |
| Description | This feature is useful when there is some issue in current version of a doubt |
| Process | Data validation |
| Precondition | Authenticated |

7. Remove Doubt:

| | |
|--------------|--|
| Output | Success or Failure Message |
| Description | Delete particular doubt which is created by user(if doubt is irrelevant) |
| Precondition | Authenticated |

8. Logout:

| | |
|--------------|--|
| Description | To logout from the system |
| Process | Session will be destroyed and The user will be redirected to the home page |
| Precondition | Logged into the system |

9. Save the code:

| | |
|--------------|---------------------------------|
| Input | Code you want to save |
| Description | You can save the code |
| Process | Saving the code into the system |
| Precondition | Authenticated |

10. Various Themes:

| | |
|-------------|--|
| Input | Select the theme |
| Description | You can change the theme of your code editor |

11. Compile and Run the code:

| | |
|-------------|-----------------------------------|
| Input | Code you want to write |
| Description | User can compile and run the code |

12. Upcoming Contest:

| | |
|-------------|--|
| Description | Get some of the details like starting/ending date and time of the contest from various sites |
|-------------|--|

Other Nonfunctional Requirements**1. Performance Requirements**

Performance should not be an issue because all the data queries involve small pieces of data. Changing the screen will require very little computation and thus will occur very quickly. Server updates could only take a few seconds as long as the device can maintain a steady signal. Website will also up for 24x7 except the maintenance.

2. Safety Requirements

Make this application lightweight, so that it puts a low load on the device. Only the project admin will be having access to the database at the back-end. So, the admin will have rights for modifications as well as direct updates to the database.

3. Security Requirements

System should provide a secure login/registration system, and should not allow unauthorized users to access the application.

Secure systems need secure database storage just like many other applications.

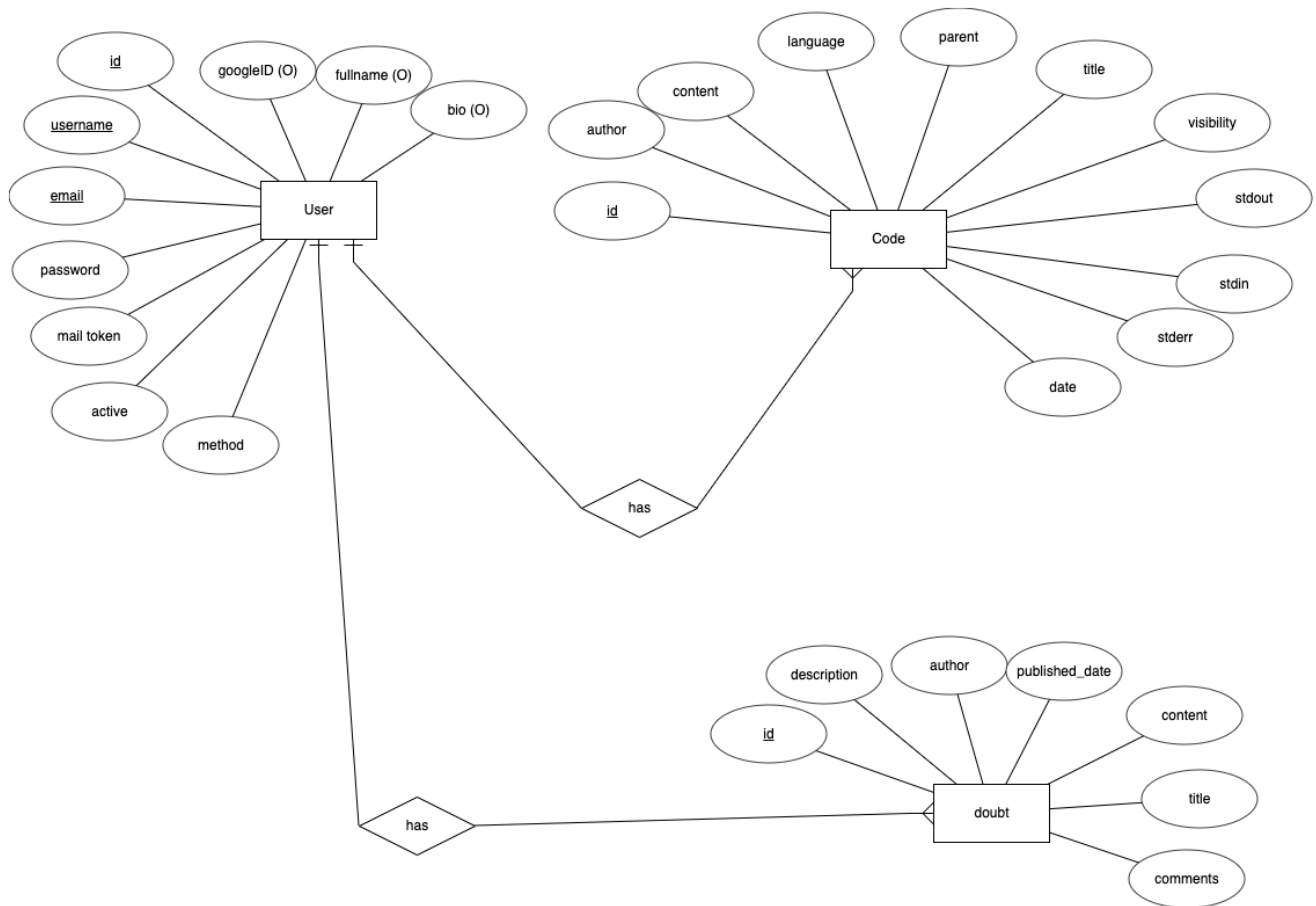
4. Software Quality Attributes

System should be

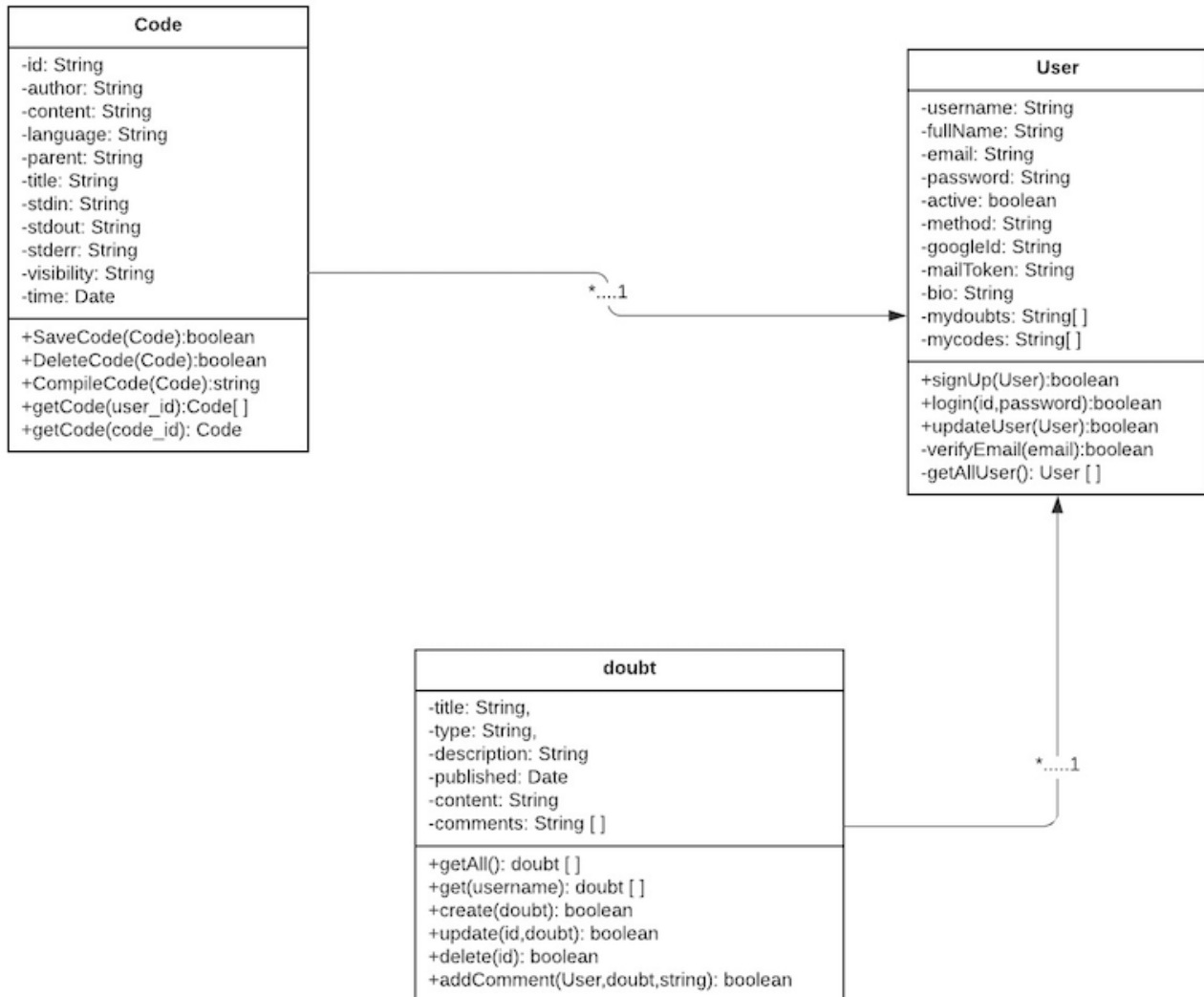
- Consistent in performance
- Safe and Secure
- Robust
- Scalable
- Flexible
- User friendly
- Efficient

4. Implementation Detail

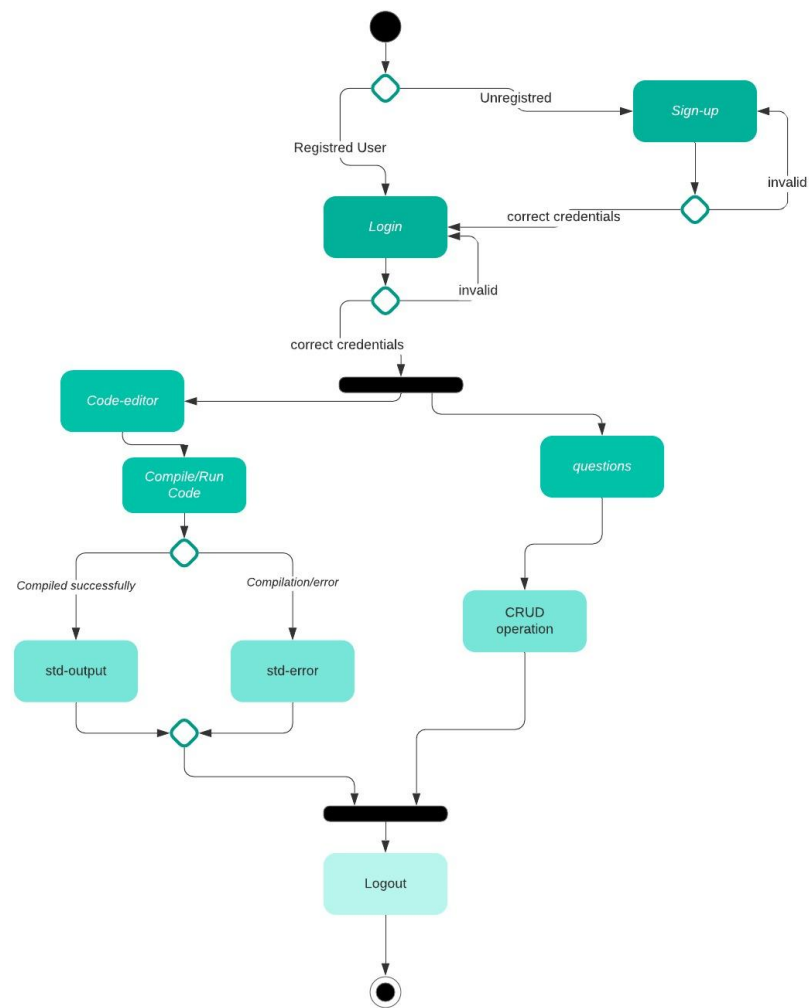
ER diagram



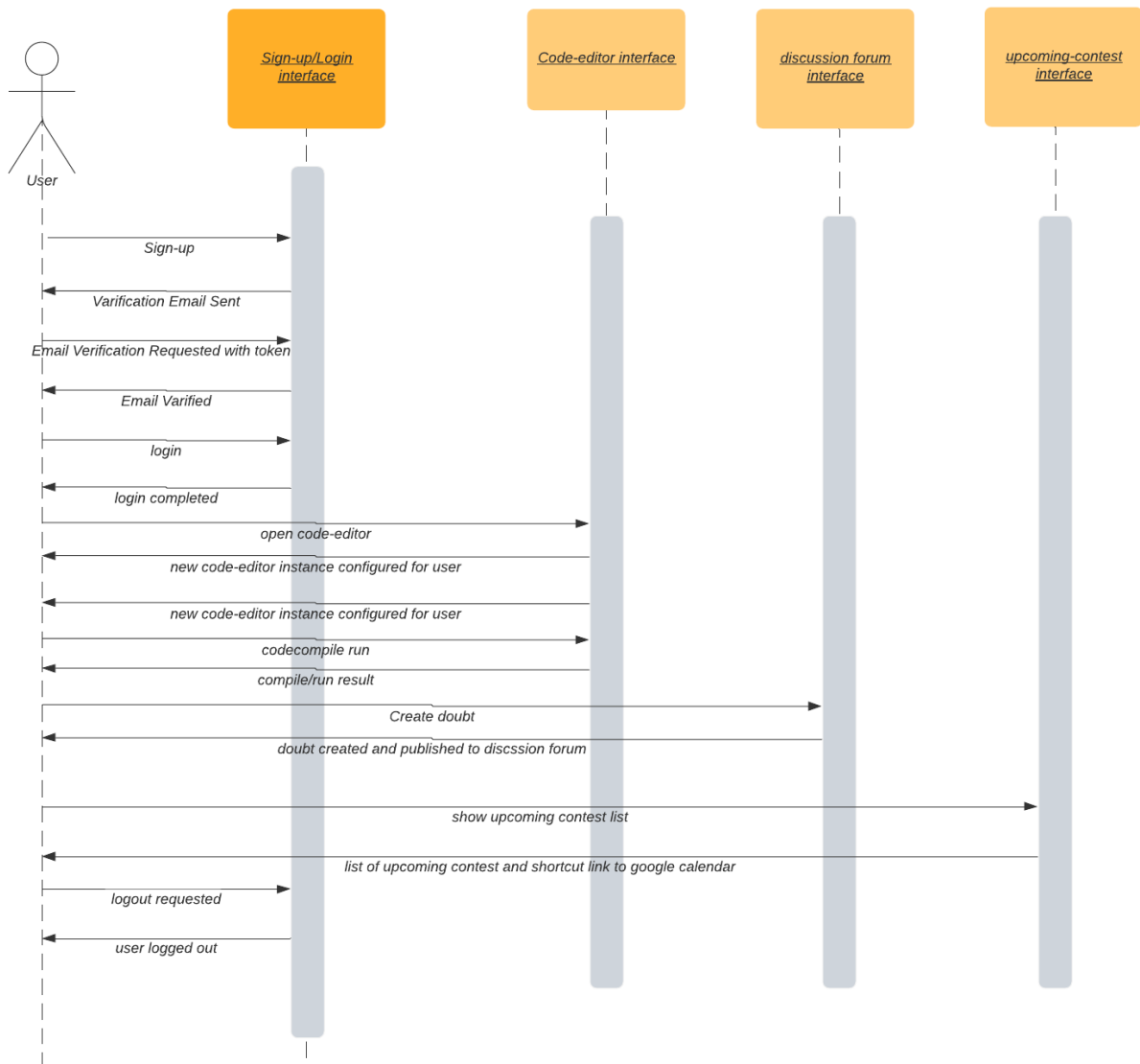
Class diagram



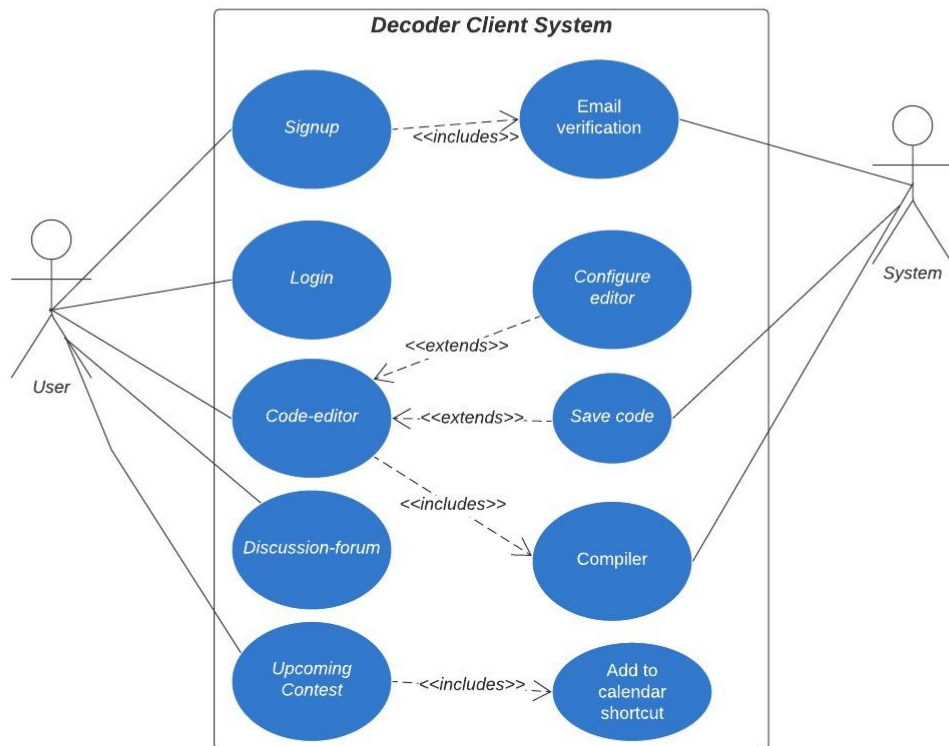
Activity diagram



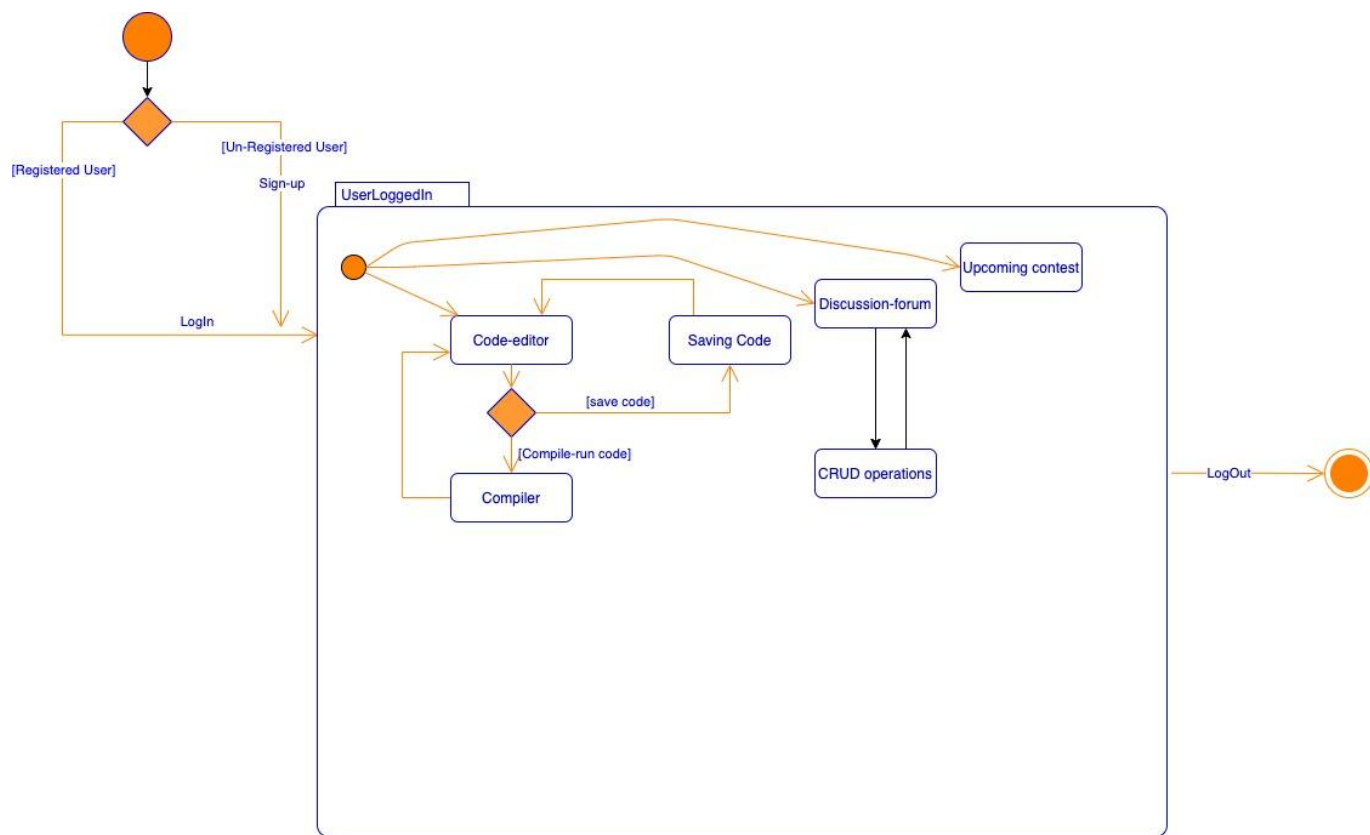
Sequence diagram



Use Case Diagram



State Chart Diagram



Database design

User

| | |
|------------|--------------------|
| <u>_id</u> | Unique primary key |
| UserName | String |
| FirstName | String |
| LastName | String |
| Bio | String |
| Password | String |

Doubt

| | |
|----------------|---|
| _id | Unique primary key |
| Author | String |
| Published Date | Date |
| Title | String |
| Description | String |
| Content | String |
| Comments | Array of comment Comment = {author, content, published date} |

Code

| | |
|----------------|--------------------|
| _id | Unique primary key |
| Title | String |
| Code | String |
| Input | String |
| Output | String |
| Stderr | String |
| Author | string |
| Published Date | Date |

5. Implementation Detail

1. Sign-up / Login

Sign-up functionality was successfully implemented. Users should enter valid credentials details during the sign-up process. Proper validation messages are shown if a user gives incorrect/invalid credentials. Verification email is sent to the user to avoid misuse of the email address hence unless the user doesn't confirm email using a token sent to their email address from the system the account will not get activated. Afterwards users will be able to login through either their unique username or email and password.

2. Compiler API

We've created a RESTful API in the backend which will help in compiling the code and then running the code on a certain set of input and yielding the corresponding stdout/stderr.

3. Discussion Forum

We've added functionality of a discussion forum where users can ask doubts, comment on questions and discuss topics. Discussion forum supports markdown syntax so that it would be easier to write mathematical formulations, codes, links etc.

4. Upcoming Contests

We've fetched future competitive programming contests and listed them down, users can sort them according to the website, search for particular contests, add contests to their google calendar using just one click. The data is fetched using free api provided by kontest.com.

6. Testing

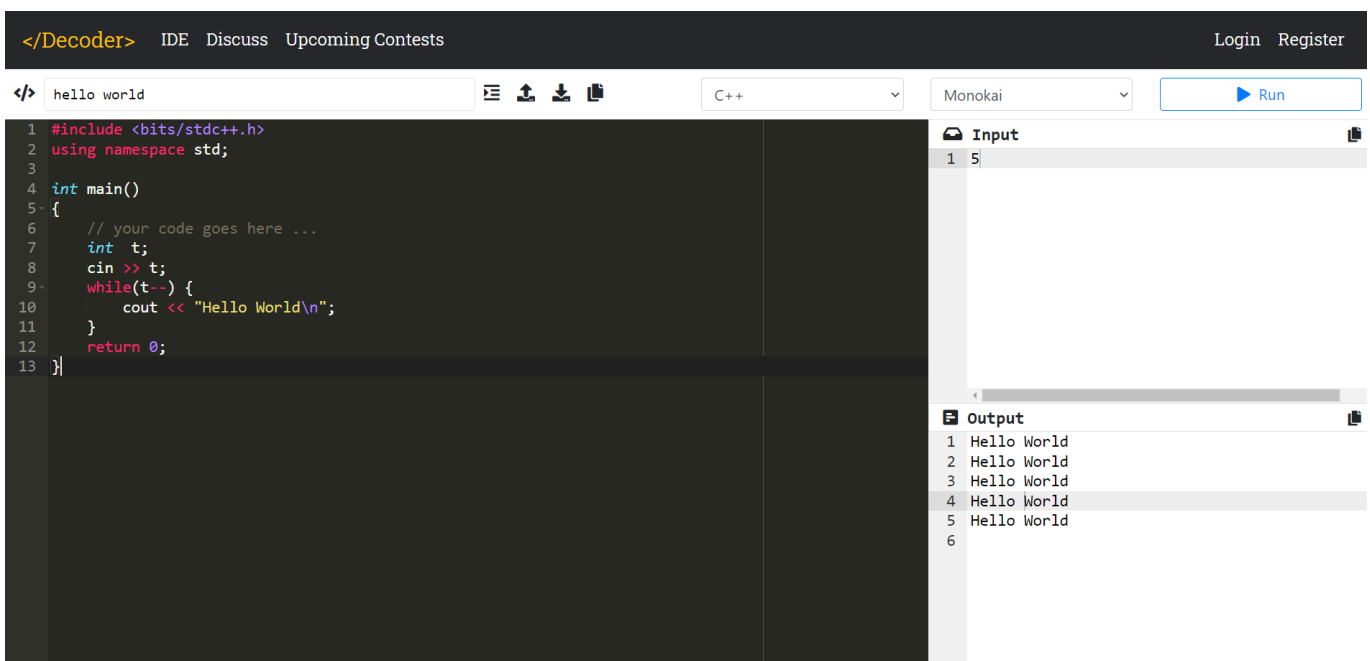
| Module | Field names | Expected output | Actual output |
|-------------|---|--|--|
| Login | Username & Password (correct credentials) | Redirect to Home page | Redirect to Home page |
| Login | Username & Password (incorrect credentials) | Validation error message and stays on login page | Validation error message and stays on login page |
| Sign-Up | Email (email which is already taken) | Warning message and stay to signup page | Warning message and stays on signup page |
| Blog | Try to create blog without logged in | Warning and redirect to the home page. | Warning and redirect to the home page. |
| Code-editor | Trying to compile code | Code compilation successful and corresponding stderr/stdout is given | As expected |

7. Screenshots

Home page of the website contains a navbar for ide, discussion forum, upcoming contest, login and register.



Code ide with different languages and themes with 3 sections: code editor, input editor and output editor.



Discussion forums contain recent doubts asked by different authors.

| </Decoder> IDE Discuss Upcoming Contests | | Login Register |
|---|--|-------------------------|
| <input type="text"/> Search questions or author ... | | |
| Author : Dhruv_Gheewala | | Published : 8-Mar-2021 |
| Hello World | | |
| This blog is on how to use our blog service and also how to use markdown in your blog to create it more attractive. | | |
| Author : kushal.p13 | | Published : 8-Mar-2021 |
| Concatenated-Sums Editorial (from binarysearch.io) | | |
| Editorial of problem Concatenated-Sums taken from binarysearch.io | | |
| Author : dhiraj-01 | | Published : 8-Mar-2021 |
| Get a Software Engineering Job/Internship - Ultimate Guide | | |
| This document is for self-preparation | | |
| Author : dhiraj-01 | | Published : 14-Mar-2021 |
| What is a lambda expression in C++? | | |
| C++, lambda expression | | |
| Author : Dhruv_Gheewala | | Published : 14-Mar-2021 |

View / read particular doubt

| </Decoder> IDE Discuss Upcoming Contests | | Login Register |
|---|--|------------------------|
| Author : dhiraj-01 | | Published : 8-Mar-2021 |
| <div>title</div> Get a Software Engineering Job/Internship - Ultimate Guide | | |
| <div>description</div> This document is for self-preparation | | |
| <div>content</div> Get a Software Engineering Job/Internship - Ultimate Guide | | |
| This document is for self-preparation. Check out SDE Bootcamp if you want to: <ul style="list-style-type: none"> fast-track your learning through hands-on learning, and, have engineers from top product-based companies teach and mentor you Let's divide the job search process into 4 stages: <ul style="list-style-type: none"> Searching for and applying to jobs Getting your resume shortlisted Clearing interviews Getting an offer letter | | |

Upcoming contests list on different platforms

</Decoder>IDEDiscussUpcoming ContestsLoginRegister

AllHackerRankCodeChefHackerEarthLeetCodeCS AcademyTopCoderAtCoderKick StartCodeForcesTophSearch

| # | Contest | Start time | End time | Duration |
|---|--|---------------------|---------------------|----------|
| 1 | ProjectEuler+ (HackerRank) | 07-07-2014 at 21:08 | 31-07-2024 at 00:00 | 10.1 Yrs |
| 2 | Past ZCO Problems (CodeChef) | 05-11-2018 at 00:00 | 27-04-2024 at 00:00 | 5.5 Yrs |
| 3 | Past INOI Problems (CodeChef) | 05-01-2019 at 00:00 | 27-06-2024 at 00:00 | 5.5 Yrs |
| 4 | IARCS OPC Judge Problems (CodeChef) | 09-10-2019 at 00:00 | 08-10-2021 at 03:00 | 2.0 Yrs |
| 5 | DSA Learning Series (CodeChef) | 30-03-2020 at 00:00 | 30-03-2022 at 00:00 | 2.0 Yrs |
| 6 | AIM ICPC - Weekly Training Series (CodeChef) | 29-12-2020 at 00:00 | 17-06-2023 at 00:00 | 2.5 Yrs |
| 7 | AGEING BETTER WITH ICTs (HackerEarth) | 15-03-2021 at 13:30 | 19-04-2021 at 03:29 | 34.6 Day |
| 8 | Code with SAP Labs India - Discover, Design, Deliver (HackerEarth) | 16-03-2021 at 09:00 | 18-04-2021 at 23:55 | 33.6 Day |
| 9 | You have the virus: HackerEarth Machine Learning challenge (HackerEarth) | 26-03-2021 at 19:30 | 25-04-2021 at 19:30 | 30.0 Day |

Login page

</Decoder>IDEDiscussUpcoming ContestsLoginRegister

Login

Don't have an account ? [create one](#)

Username or Email

Your name

Username or Email is required!!

Password

Your password

Password is required!!

Log In


Registration page

[</Decoder>](#)
[IDE](#)
[Discuss](#)
[Upcoming Contests](#)

[Login](#)
[Register](#)

Register

Already have an account ? [login](#)

Username 

Email

Password

Repeat password

Profile page

[</Decoder>](#)
[IDE](#)
[Discuss](#)
[Upcoming Contests](#)

[dhiraj-01](#)
[Logout](#)

[</> My Codes](#)
[🔗 My Questions](#)

Dhiraj Govindvira

dhiraj-01

Hey there! I am competitive programmer and i enjoy problem solving alot! I am huge fan of tmkoc.

[Edit Profile](#)

Admin

Joined 12 Dec 2020

Support

Get fast, free help from our friendly assistants.

[Contact Us](#)

User saved code

[</Decoder>](#)
[IDE](#)
[Discuss](#)
[Upcoming Contests](#)

[dhiraj-01](#)
[Logout](#)

| All | C | C++ | Java | Python | Javascript | Search Your Code ... |
|-----------------------------|-----------|------------|---------------------|--------|------------|----------------------|
| Title | Author | Language | Date | | | |
| api use | dhiraj-01 | Javascript | 08-03-2021 at 14:53 | | | |
| Hello World | dhiraj-01 | Python | 08-03-2021 at 14:52 | | | |
| undefined | dhiraj-01 | C | 01-03-2021 at 16:41 | | | |
| undefined | dhiraj-01 | Python | 01-03-2021 at 16:41 | | | |

8. Conclusion

The solution is to provide an online tool that gives a compiler for popular languages so that programmers don't have to waste their time in installing SDKs and compilers for different languages and setting up their own environment. Discussion forum to get most out of the competitive programmer's community and contribute towards the community. Contest time table to get up to date with upcoming contest timings and duration.

9. Future Extension

The future extension of this project should include support for more programming languages, unlimited compilation requests, and free compilation api for developers to create more and more competitive programming helper tools.

10. References

- https://en.wikipedia.org/wiki/Competitive_programming
- <https://codeforces.com/>
- <https://www.codechef.com/>
- <https://atcoder.jp/>
- <https://ideone.com/>
- <https://pastebin.com/>
- <https://www.jdoodle.com/>
- <https://www.kontests.net/>

Thank You