A
PROJECT REPORT ON

DCODER

By

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CERTIFICATE

This is to certify that the practical / term work carried out in the subject of **System Design Practice** and recorded in this journal is the bonafide work of

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Table of Contents

1. Abstract

Decoder is a website that contains an online compiler for some of the languages. Users can read the questions and can compile, save and share their code. Also, Users can get the data regarding upcoming contests of various platforms like Codechef, Codeforces, Leetcode, etc..

2. Introduction

2.1 brief introduction

Decoder platform is created for programmers.

User is able to add,edit and delete the questions which are added by himself only. Other users can only read these questions. Also, users can simply use a compiler built in our website and compile/run their code. Users can save multiple codes. One user can't see the other user's code.

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.

2.2 Tools / Technologies Used

Technologies :

        HTML5

        CSS3

        Bootstrap

        ReactJS

        Express with NodeJS

        MongoDB

Tool :

        Git

        GitHub

        Visual Studio Code

Platforms:

        Local Development Server

3. Software Requirement Specifications

Manage User Profile:

R1.1 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

Registration:

Input	Credentials of the user as asked
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	Registers an account
Precondition	Credentials validation. If validation is successful then account is registered into the system

Forgot Password:

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

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

Manage code:

Input	Required credentials
Output	Confirmation message
Description	User can save, update, delete and share the code
Process	Save, update , delete , share code
Precondition	Authenticated

Compile and Run the code:

Input	Code you want to write
Output	Compile error or output
Description	User can compile and run the code
Process	Compile code in system

Upcoming Contest:

Input	Required button click(on various platform)
Output	Upcoming contest list based on filter
Description	Get some of the details like starting/ending date and time of the contest from various sites
Process	Get contest list
Precondition	User should have an account

Manage Question:

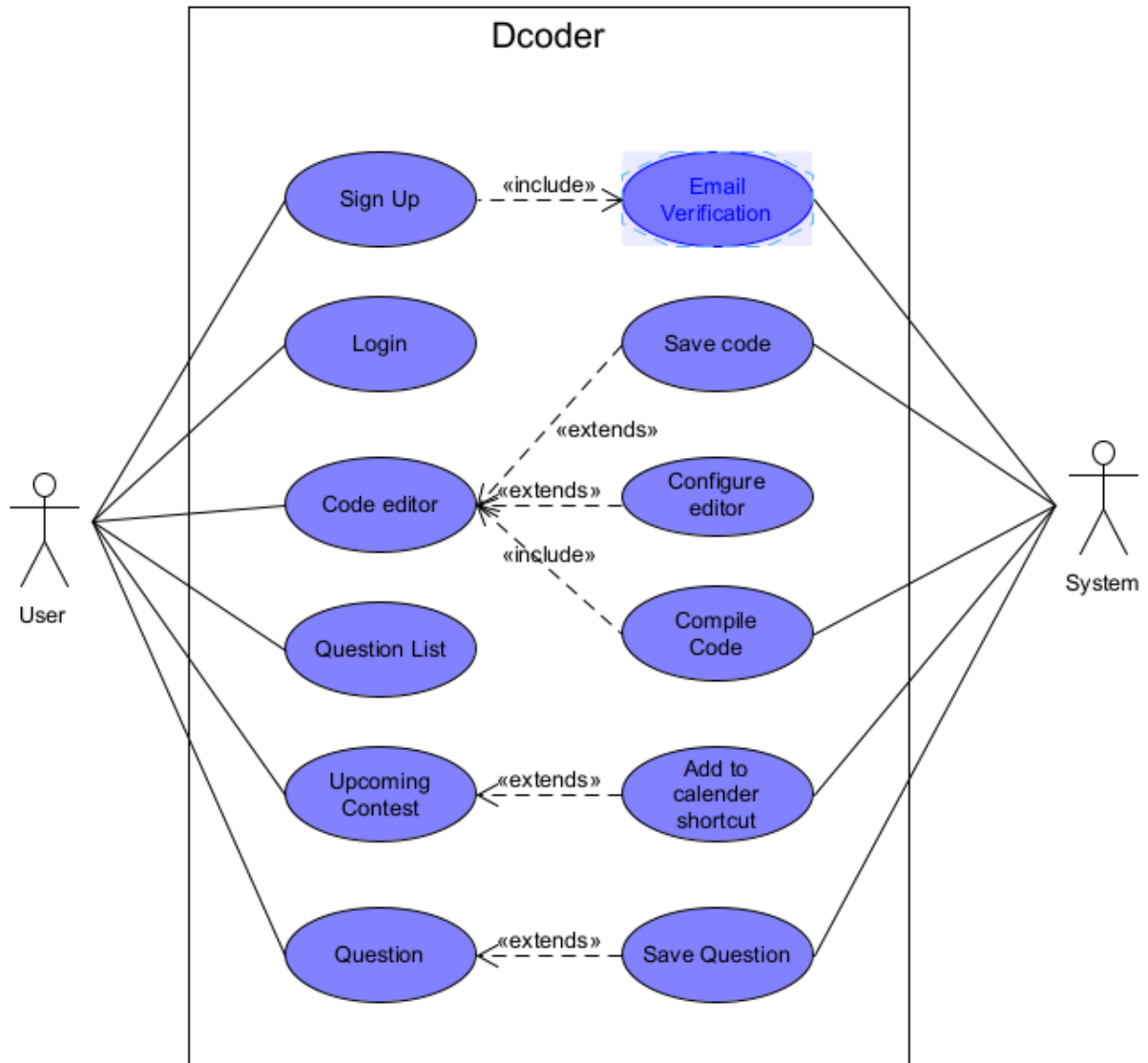|	
Input	Required credentials(title,description,tag etc..) for save,update. Button click for Read, Delete.
Output	Confirmation message

Description	User can save, update, delete and read Question
Process	Save, update , delete , share Question
Precondition	Authenticated

Show Question list:
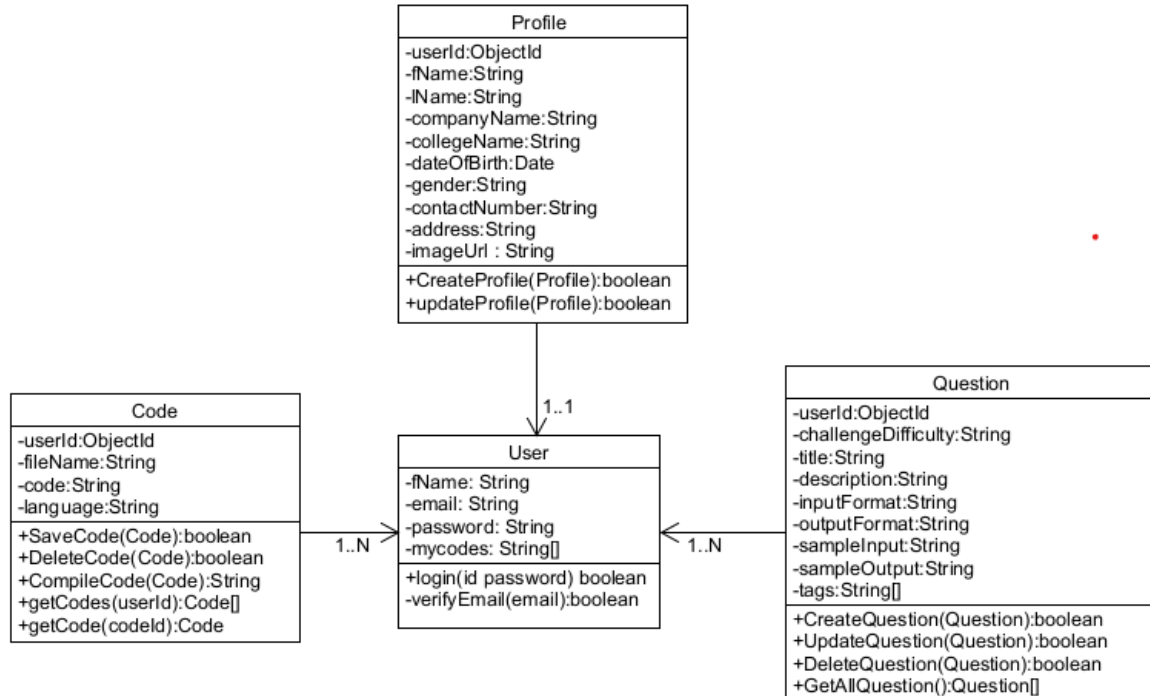
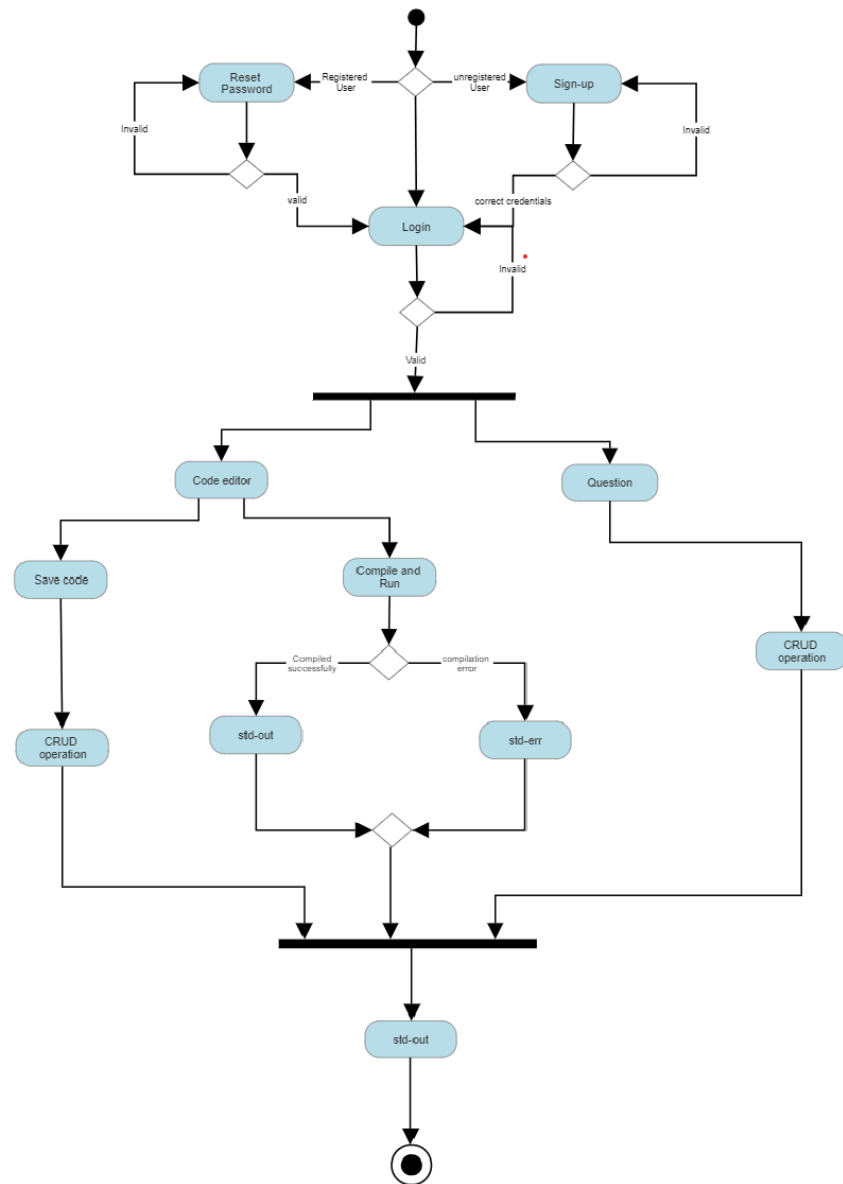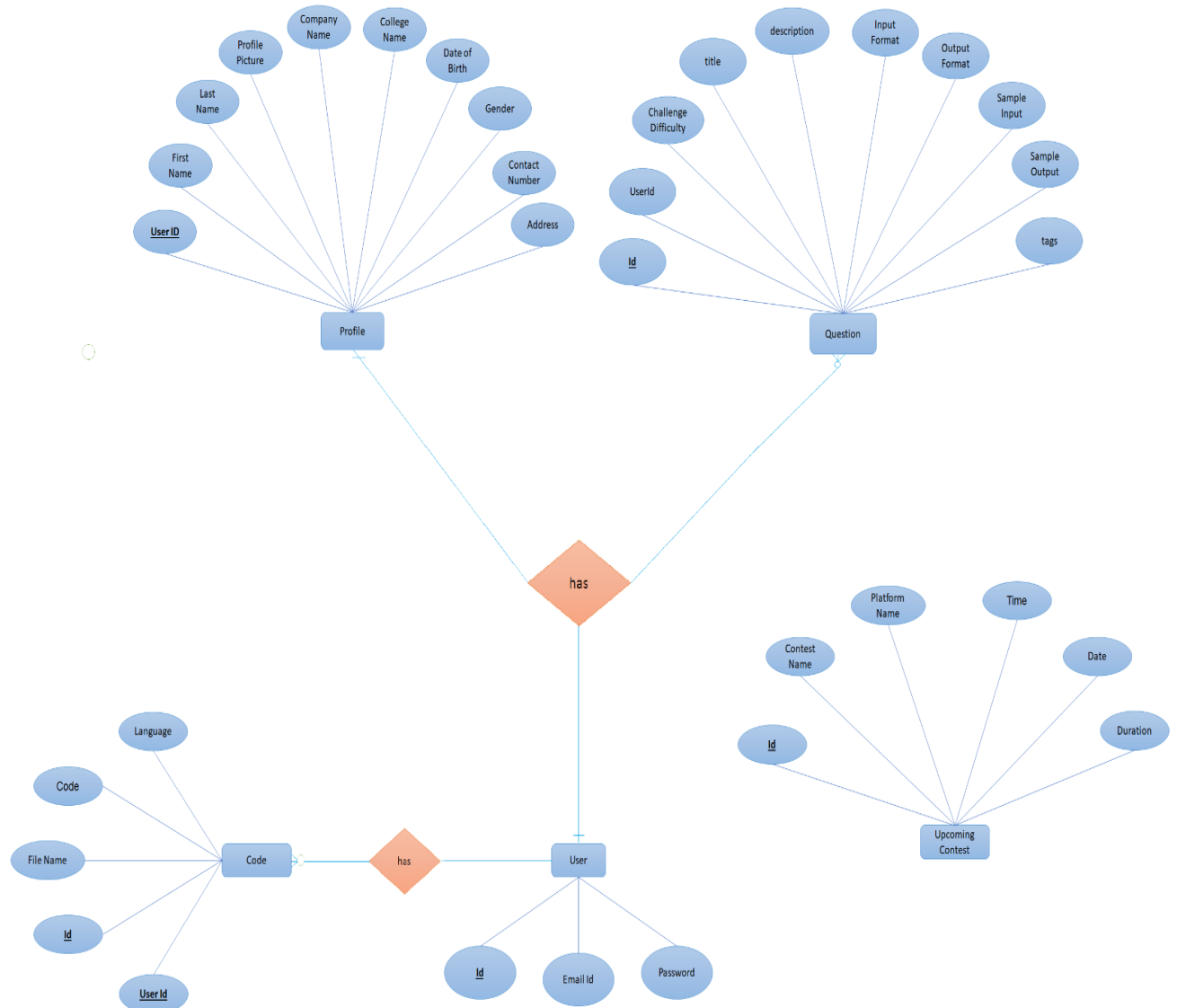| Input	Button Click
Output	List of all the questions
Description	Get list of all the question based on difficulty level and tags
Process	Searching the questions from database
Precondition	User should have an account

4. Design

4.1 Use Case Diagram

4.2 Class diagram

Profile

-userId:ObjectId
-fName:String
-lName:String
-companyName:String
-collegeName:String
-dateOfBirth:Date
-gender:String
-contactNumber:String
-address:String
-imageUrl : String

+CreateProfile(Profile):boolean
+updateProfile(Profile):boolean

1..1

User

-fName: String
-email: String
-password: String
-mycodes: String[]

+login(id password) boolean
-verifyEmail(email):boolean

Code

-userId:ObjectId
-fileName:String
-code:String
-language:String

+SaveCode(Code):boolean
+DeleteCode(Code):boolean
+CompileCode(Code):String
+getCodes(userId):Code[]
+getCode(codeId):Code

1..N

Question

-userId:ObjectId
-challengeDifficulty:String
-title:String
-description:String
-inputFormat:String
-outputFormat:String
-sampleInput:String
-sampleOutput:String
-tags:String[]

+CreateQuestion(Question):boolean
+UpdateQuestion(Question):boolean
+DeleteQuestion(Question):boolean
+GetAllQuestion():Question[]

1..N

4.3 Activity diagram

4.4 ER diagram

4.5 Data dictionary

User						
Sr. No.	Field Name	Data Type	Width	Required	Unique	PK/FK
1	Id	String	100	Yes	Yes	PK
2	Email	Email	30	Yes	Yes	
3	Password	Password	12	Yes	No	

Profile							
Sr. No.	**Field Name**	**DataType**	**Width**	**Required**	**Unique**	**PK/FK**	**Referenced Table**
1	Id	String	100	Yes	Yes	PK	
2	UserId	String	100	Yes	Yes	FK	User
3	First Name	String	30	Yes	No		
4	Last Name	String	30	No	No		
5	College Name	String	100	No	No		
6	Date of Birth	Date	30	No	No		
7	Image URL	String	500	No	No		
8	gender	String	10	No	No		
9	String	Address	1000	No	No		

Question							
Sr.No.	Field Name	Data Type	Width	Required	Unique	PK/FK	Referenced Table
1	Id	String	100	Yes	Yes	PK	
2	UserId	String	100	Yes	No	FK	User
3	Challenge Difficulty	String	100	Yes	No		
4	Title	String	100	Yes	No		
5	Description	String	100	Yes	No		
6	Input Format	String	100	Yes	No		
7	Output Format	String	100	Yes	No		
8	Sample Input	String	100	Yes	No		
9	Sample Output	String	100	Yes	No		
10	Tags	String	100	Yes	No		

Code							
Sr. No.	**Field Name**	**Data Type**	**Width**	**Required**	**Unique**	**PK/FK**	**Referenced Table**
1	Id	String	100	Yes	Yes	PK	
2	UserId	String	100	Yes	No	FK	User
3	FileName	String	100	Yes	No		
4	Code	String	1000	Yes	No		

5. Implementation Detail

1. **Sign-up / Login**
   Sign-up functionality is successfully implemented. Users need to enter valid credentials details during the sign-up process. Proper validation messages are shown if a user gives incorrect/invalid credentials. Verification email(OTP) is sent to the user to avoid misuse of the email address hence unless the user doesn't enter OTP which is sent to the entered email address user wouldn't be able to register. Afterwards users will be able to login through either their unique email and password. If during login the user forgot the password then also one can update the password through OTP sent to the registered email address.

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. **Question and Code**
   Users can do CRUD(Create, Read, Update, Delete) operations on the questions. Users can also search problems by difficulty level(Easy, Medium, Hard) and by tags(dp,binary search, backtracking etc..). Users are able to compile, save and share the code.
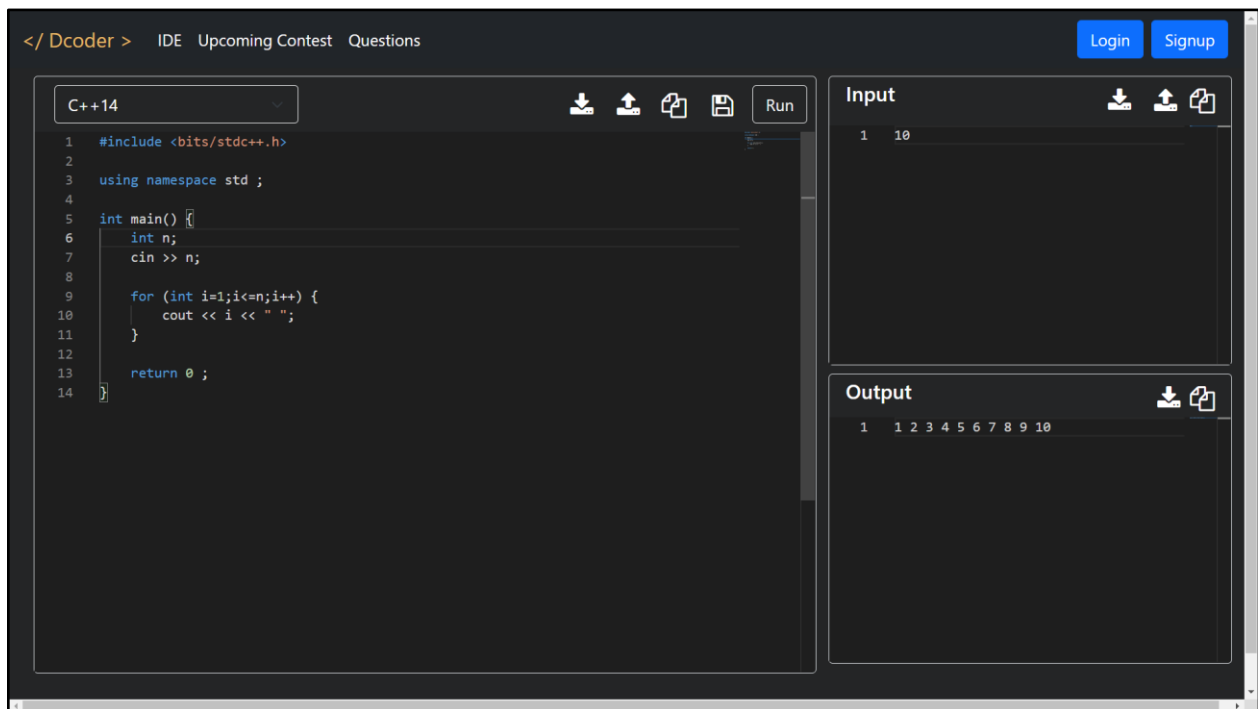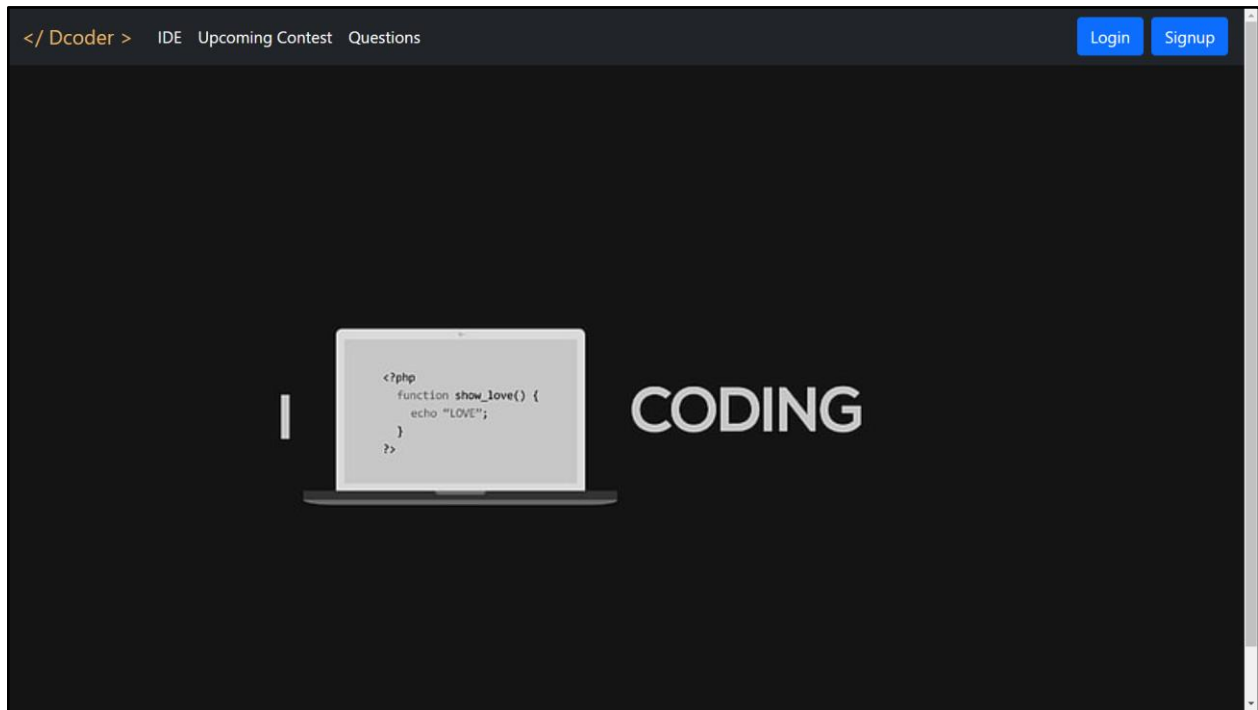
4. **Upcoming Contests**

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	Status
Login	Username & Password (correct credentials)	Redirect to Home page	Redirect to Home page	Success
Login	Username & Password (incorrect credentials)	Validation error message and stays on login page	Validation error message and stays on login page	Success
Sign-Up	Email (email which is already taken)	Warning message and stay to sign up page	Warning message and stays on signup page	Success
Sign-Up	Correct credentials	Redirect to login page	Redirect to login page	Success
Code-editor	Trying to compile code	Code compilation successful and corresponding stderr/stdout is given	As expected	Success

7. Screenshots

</ Dcoder >   IDE   Upcoming Contest   Questions   Login   Signup

Difficulty Level

Medium ▾

Search by Tags

All ▾

Title	Difficulty	Tags	Read
edit question test	medium	Dynamic Programming , Depth-First Search ,	Read
Permutations II	medium	Sorting ,	Read
Digit Queries	medium	Binary Search , Breadth-First Search , Sorting , Hash Table ,	Read
Longest Palindromic Substring	medium	Hash Table , Dynamic Programming ,	Read
userid test	medium	Array , String , Hash Table ,	Read
temp	medium	Hash Table , String ,	Read

</ Dcoder >   IDE   Upcoming Contest   Questions   My code   Hello nikhil ▾   Logout

Visit to a Beach

Press F11 to exit full screen

You are going to visit a beach this new Year, where there are N places to visit. You know that there are 2 types of pebbles on the beach i.e. X and Y . You want to collect atleast A pebbles of type X and atleast B pebbles of type Y. You have the information that there are x[i] pebbles of type X and y[i] pebbles of type Y at the ith place.

You are at the beach for only 1 day so you want to minimize the number of places to visit.

Print minimum number of places you have to visit to collect atleast A pebbles of type X and atleast B pebbles of type Y.

Input Format

First Line contains 3 space seperated integers, N(number of places), A (minimum number of pebble type X to be collected), B (minimum number of pebble type Y to be collected).

Next N lines contain 2 space seperated integers x[i] and y[i] that is number of pebbles of type X and Y respectfully at ith line.

Output Format

If it is not possible to collect atleast A pebbles of type X and B pebbles of type Y then print -1, else print minimum number of places that need to be visited

Sample Input

3 6 4
5 2
1 2
1 4

Sample Output

2

Tags

Dynamic Programming

Register

Name *
jenil

Email *
jenil@gmail.com

Password *
•••••

Re-Password *
•••••

RE-SEND OTP

1559

VERIFY

</br Dcoder > IDE Upcoming Contest Questions · Login · Signup

Login

Email *

Password *

LOGIN

New to Dcoder?

Forgot Your Password?

Reset Password

Email *

New Password *

Confirm New Password *

SEND OTP

Back To Login

</br Dcoder > IDE Upcoming Contest Questions My code · Hello nikhil ▾ · Logout

Modify profile

My Question

All C C++14 Java Javascript Python3

#	File Name	Language	View	Delete	Share
1	hello	c	✎	✖	➔
2	hello	cpp14	✎	✖	➔
3	hello	python3	✎	✖	➔

</Dcoder >   IDE   Upcoming Contest   Questions   My code   Hello nikhil ▾   Logout

Modify profile
My Question

First Name

Nikhil

Last Name

Bambhroliya

Company Name

xyz

College Name

DDU

Date of Birth

02-03-2000

Gender

◉ Male ◯ Female

Contact Number

🇮🇳 ▾ | +91 1234 567 890

Address

xyz , xyz

Save

</Dcoder >   IDE   Upcoming Contest   Questions   My code   Hello nikhil ▾   Logout

Modify profile
My Question

Difficulty Level   **Search by Tags**

All   ▾   All   ▾

Title	Difficulty Level	Tags	Read Question	Edit Question	Delete Question
Visit to a Beach	hard	Dynamic Programming ,	◎	✎	✖

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. Users can save their code at the server so no waste of storage space. Contest time table to get up to date with upcoming contest timings and duration.

9. Limitation and 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. Also discussion form for doubts for user's question.

10. References

- https://getbootstrap.com/
- https://reactjs.org/
- https://ideone.com/
- https://www.jdoodle.com/
- https://www.kontests.net/
- https://www.npmjs.com/package/@monaco-editor/react