



InnoDev Problem Statements

Electromania, Avishkar 2020, MNNIT Allahabad

Rules & Suggestions

- A team may contain at most 4 members.
- This event is exclusively for B.Tech. 2nd and 3rd year ECE and EE students only.
- Plagiarism of any kind will result in elimination.
- Partial projects will also be considered for evaluation.
- The use of GitHub is encouraged.
- Open problems are allowed(subject to approval)

Event Coordinators :-

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LiveCode

Team Electromania is confused over how to conduct interviews in a fair and trouble-free manner. Vivek has come up with an idea of building a live application for coding interviews where one can change the code and instantly see the effect among shared users. This could help people having a low bandwidth network. Embedding programming language support and a mini chat window will make it more sophisticated.

Basic Features:

- Ability to create multiple interview rooms with different links and passwords.
- Code editor with proper indentation and keyword highlighting for multiple languages. (User must be able to switch across languages).
- Edited code should be visible to all users instantly.
- Chat Window for communication.

Advanced Features:

- Ability to share file across chat window (For sharing resume if required.)
- Ability to run code after providing input and getting the result using some available API.
- Allow Note taking available for interviewer only.
- The candidate is able to join the room only after the interviewer lets them in.
- Ability to support multiple interviewers in a single room.

"Let's call it an accidental feature"

Deja Vu

Nikhil's startup has just finished their first round of hiring. He has been informed that the invigilation was not up to the mark. The test contained both subjective and coding questions. Help him build a plagiarism detector that can detect both text and source code plagiarism.

Basic Features:

- Show plagiarism score.
- Allow multiple file formats in the user interface.
- Give an option for plagiarism check from a specific source Ex:- medium, GFG etc.

Advanced Features:

- Provide APIs for platform integrations.
- Give a detailed report about percentage similarities and reference.
- Download and share options for generated reports.

"Hey! It compiles! Ship it!"

Obfuscation

Obfuscation is the action of making something unintelligible. In software development, this action can be applied to source code or binary applications. The motivation is to allow proprietary code to be distributed to third-parties without risking a recreation of the intellectual property within it.

Rohit has developed an important model for a client. he needs to share the working code with the client but he wants to protect his intellectual property. Help him develop a command line application that can help him obfuscate the code.

Basic Features:

- A command that takes any C/C++ source file and name of output file as input and store the obfuscated code in a file with name as provided by the user.
- Help command for all available commands (For helping the users).
- The created output file should be a proper C/C++ file which can be compiled and executed to produce the same results as the input file.

Advanced Features:

- Add another command that takes in the obfuscated code and converts it back into the original code.

“God is real, unless declared integer”

Scan2PDF

The government of India has recently banned CamScanner, Sanya is very furious over this as she is obsessed with presenting her assignments in a well-groomed manner. All other alternatives impose watermarks on the pages. Build an application for her that can turn several kinds of documents, images, etc to PDF.

Basic Features:

- Scan multiple pages and add them to PDF.
- Allow user to crop the scanned images.
- User should be able to see a preview for the pdf that will be generated.

Advanced Features:

- Rearrange pages in any order. Delete unwanted pages.
- Should be able to use pages from gallery as well.
- Show a list of all the PDF's created using this application.
- Auto-select the page area for cropping.
- Add a share button to share the PDF across other applications.

"If brute force doesn't solve your problems, then you aren't using enough."

Perspicacity

Yash is a technical writer. His articles are admired among his audience. But he doesn't like using boring words in his articles. He is a great fan of Shashi Tharoor, so he replaces those words with fancy synonyms. Help him with this tedious job of manual searching by making a chrome extension that will suggest him synonyms for a picked word. Any other feature that will assist him is most welcome.

Basic Features:

- Suggest Synonyms for selected words.
- Allow copying any suggested synonym to the clipboard.
- Keep a brief search history so that user can look at it later.
- Show new words every hour so that he can increase his vocabulary.

Advanced Features:

- Sometimes Yash likes to use few words from different languages. He should be able to translate between languages.
- The extension should be able to pronounce the words so that Yash can learn to pronounce too.
- Quiz Yash based on the words he has searched for or word of the day to check his knowledge.
- Sometimes Yash likes to write poetry as well, Suggest some rhymes and antonyms as well.

"Weeks of coding can save you hours of planning"

CV Builder

Every year during internship and placement season there's a lot of fuss about building an attractive and effective resume. Picking up the right template and then formatting in MS Word is quite a work and we often end up scratching our head. Build a platform which offers some great templates and a user-friendly way to reconstruct according to our needs plus it should also offer tools to build our own template.

Basic Features:

- Ask the user for various details like Education, Projects, Experience etc.
- Show the available templates.
- Offer tools to create new templates.
- User should be able to share their custom template on the forum.
- Allow exporting the CV as a document or PDF.

Advanced Features:

- Take project data from users GitHub repositories and create summaries for the CV.
- Ask the user to upload their previous CV and extract all the data from it.
- Data can also be taken from user's LinkedIn profile.
- Add an option for Adding photo into the CV.
- Allow users to tweak colors and fonts of each template by providing appropriate tools.
- Sort templates based on popularity.

"You start coding. I'll go find out what they want"

Adaptive Learning

Due to the COVID-19 pandemic, all schools are closed suddenly leaving Mrs. Ojha wondering how she is going to improve the Math skills of her mischievous son Ash Jr. who is presently in class 2 and refuses to study at home. She tried hard to make him follow the online classes of his school teacher, but all her efforts were futile. Help Mrs. Ojha by designing an adaptive learning application that will help Ash Jr. to learn different topics in an engaging, playful, and interactive manner.

Basic Features:

- Login/Signup facility for students with mail verification
- Reset password using SMS OTP or mail
- ChatBot based topic wise learning
- Interactive Teacher's Dashboard

Advanced Features:

- **Reward and Recognition System:** In order to make learning joyful for the students, a reward and recognition system can be made. The recognition system traces the time spent by the student on the portal and their consistency in solving problems to award them with virtual coins and badges. The coins can then be used to redeem certain benefits from teachers like extra computer time, free chocolates etc, and a leader board of students on the basis of coins and badges can also be prepared.
- **Discussion Forum:** A discussion forum can also be developed where the students can ask their questions and get it answered by any of their peers. The students who are able to solve the doubts of their peers are also rewarded with virtual coins. This will enhance peer to peer learning among students.

"Adding manpower to a late software project makes it later!"

Auxili egeas

Sahil is a very lazy guy, he doesn't like to walk around on foot instead he uses bicycle for every small distance but at the same time he doesn't own any . He use to borrow it from his roomie but since they got into a fight one day, his roomie doesn't allow him to use his bicycle. So now he is planning to make a cycle sharing portal. Really a geek ,isn't he? Help him with his quest.

Basic Features:

- List out all available cycles nearby with proper details.
- Generate push notifications to owner for every request made.
- Profiles of user
- Chat window

Advanced features:

- Sharing live location with the owner
- QR code scan for easy transaction, this will help to sync the availability.

"Let me just change this one line of code..."

Open Problem

-subject to approval