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CODE_RUSH COMMON COMPILER IN LAN

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Abstract: Internet access during practical and practice sessions hinders the graph of learning. The trend of copying code and pasting them can be easily observed in online exams which makes it unfair for others who are not copying. This problem can be resolved with some simple approach which will be discussed here. Code-Rush is the name given to the solutions we came up with. Code_Rush will help both to faculties and students to organize their time and efforts.

Keywords: Compiler, Coding, Coding Environment, Coding Practical, Computer Science, LAN, Local area network.

I. INTRODUCTION

Teacher Student Relations is a unique one. A Guru always helps his student in every way possible every time except one, the time when his student is giving his papers. During exams, this teacher-student relationship takes a whole new shape. Even when a guru wants his students to get a good score, he will not help him this time, the guru wants to know what his students know. The exam is a way of knowing what needs to be improved. Nowadays the Internet is the guru who has answers to all the questions and will give them to you at any time, even during EXAMS.

We noticed that the internet hinders a lot when we are writing codes during practice sessions. These sessions are to check what we have learned and constant help from the internet does no good to us, or any student who is in this situation. This same phenomenon happens during practical exams and some of us will spend more energy searching for answers than actually doing it. Cheating on examinations in academic institutions is a worldwide issue [6] and students' habits and views on cheating are developed during high school [7].

Another area of concern was the environment and of software the languages and the time consumed by setting up these environments for languages is significant. They have features that we don't need during practice and practical. We would often find students are not able to set up the environment

because for reasons they have no control on. Reasons like bad hardware, admin authentication, etc.

We tried and solved these problems by building up a project, which will make these practice and practical sessions easier and fairer.

II. THE PROBLEM

Coding is the backbone of Computer Science. When it comes to exams and practicing, the idea of having the internet ruins the whole experience. Teachers also know that there will be some students who will copy code from the internet. While conducting exams there are mainly two tasks that need to be done. Firstly, to conduct an Exam where no one can cheat. Secondly to collect the results and codes for the exam. And the internet plays a crucial role in doing these tasks. There are two scenarios that can be created by removing or including the internet. The first scenario is when we create a place where no one can cheat we can do this by cutting off the internet from the lab but this will make it harder for teachers to collect the reports without the internet. The second scenario is the one in which a collection of reports is done over the internet and the teacher views them on his computer from anywhere but with the internet, on the computer, there is a chance that some codes submitted are copied from the internet. **Now, why is this an issue?** Students now will shape the future of our society. To prepare them we need to provide them with better ways to move forward and moreover we don't want them to struggle because of this silly thing. We were excited when we saw this problem and started our exploration for finding a system in which there is no trade off.

III. CODE_RUSH IS THE SOLUTION

After doing research and experiments some solutions came and Code_Rush is the name given to these solutions. We decided to build a coding environment where one can write code and submit them with ease, without the internet. Code_Rush will be invented for College labs but can be implemented for any other place with similar variables.

Code_Rush will run in LAN (A **local area network** is a computer network that interconnects computers within a



limited area such as a residence, school, laboratory, university campus or office building.[3]) and will be available to all the devices connected to it. To eliminate the platform dependencies, it will work on Browsers. The programming environment provides the equivalent environment to teachers and the students during the programming hands-on.[8]

Code_Rush will support all the languages from the curriculum. It will have an editor to assist users in productive coding. Code_Rush will record the typed code for future reviews and will send them for review. Code_Rush will help reviews to judge the code under review. With Code_Rush we can create events and let students participate in them. To maintain the sportsman spirit, it will have a global leaderboard so that there is always a goal to achieve.

IV. PARTS OF CODE_RUSH

A. Modes of Code_Rush

Code rush will be built for both faculties and students and there are plans to make it happen. Code_Rush will operate in two modes and each mode has its own purpose.

1) Admin Mode

This mode is where the events will be created and problem statements will be added. This will be the place where creators will get to create their own series of events and questionnaires for their students. They can choose to publish their event right away or set a date and time to launch it. Creating an event will be just a two-click operation. They can add multiple questions and assign these questions with credits. When the event starts this mode will show them the leaderboard of their events. The leader Board will then assist them in analyzing the results.

2) Participation Mode

Whenever it's time to participate in event users will approach this mode. Here the events active at that period of time will be shown. Events will have descriptions about who created the event when it will end and so on. Each event will have a set of Questionnaires and the details with a link to the code editor. A code editor is a place where participants will code the solution and submit it. Code_Rush will judge the solution and will update the credits accordingly. Updated credits will be shown in the participant's profile and in the leaderboard.

B. Events

Events are important because they assist in making plans and plans they help in organizing things. Events make it easy to know what one will expect during the session because of the way it describes itself. Knowing in advance what to expect helps one to prepare himself for the upcoming tasks, which improves his experience.

Creating events is the way in which Code_Rush will be managed. An Event in Code_Rush will decide when the questionnaire wrapped in it will appear to the participants.

Events will give the ability to divide a large set of questionnaires into modules i.e. in small different events. Dividing large events into smaller events will help all to understand the set of questions, one is good at and what type of questions need more practice. Each event will have a time of start and a time of ending, this will help in showing only the events active during this time. Keeping the amount of event minimum will help participants to be focused and productive.

C. Features

Code_Rush will have many features to support his users in any way possible.

1) Leaderboard

This feature will be added to Code_Rush to assist creators to know their participants and for participants to be aware of their competitors.

2) Coding Area

This area of Code_Rush will be an ideal place for typing code and submitting it. The editor will be such that participants can type with ease. The theme of the editor will be adjustable to meet the flavor of participants. Participants will be able to give custom inputs if required and check their code before submitting them.

Participants can write code in any of the available languages in the application. Compiler languages will be added on the basis of requirements.

3) Open Compiler

There will be times when one wants just to run a code snippet and not get involved in any events, for this purpose there will be an open compiler accessible to all. This compiler will not be linked to any account. All supported language will be available to this compiling area, with support of custom inputs.

4) Judge

Judge of Code_Rush will be a helping aid to reviewers. It will check the submitted code and will only pass the code that meets the requirements of the creator. The Judge will only be active in events and not in the open compiler.

5) Practice Area

Every now and then practice is important and there should be something to do when no event is active. To fill this emptiness Code_Rush will have an area where one can go and utilize this time. The area will be under tagging practice. The practice area will focus on building up the core techniques that are essential for participants.

Practice Area will also contain some events based on specific



practices. This will help participants to focus on one area at a time.

6) Profile

A profile will be maintained for all the participants and creators. For participants, their profile will keep their basic information like name and contacts, in addition to this, there will be a record of events the user participated in and their scores. This record of events will help the participant in selecting which area needs to be improved.

For creators, their profile will keep track of the events created by them, the total number of Questions added and the number of events successfully completed. From this information, creators will be aware of events that need to be created and published.

D. Compilers and Languages

The languages supported by Code_Rush will be those used in the curriculum and then the most popular languages that are among the users.

According to the PyPL PopularitY of Programming language, the top six languages of the year 2020 are Python, Java, JavaScript, C#, PHP and C/C++ [1]. Compilers in Code_Rush can be added easily on demand.

Table 1: June 2020 popular languages

Rank	Language	Share	Trend
1	Python	31.6%	+4.3%
2	Java	19.67%	-2.4%
3	JavaScript	8.02%	-0.2%
4	C#	6.87%	-0.4%
5	PHP	6.02%	-0.9%
6	C/C++	5.69%	-0.2%
7	R	3.38%	-0.1%
8	Objective-C	2.5%	-0.3%
9	Swift	2.24%	-0.1%

The server will either save the data to the Database or possess the data and return the result back to the user.

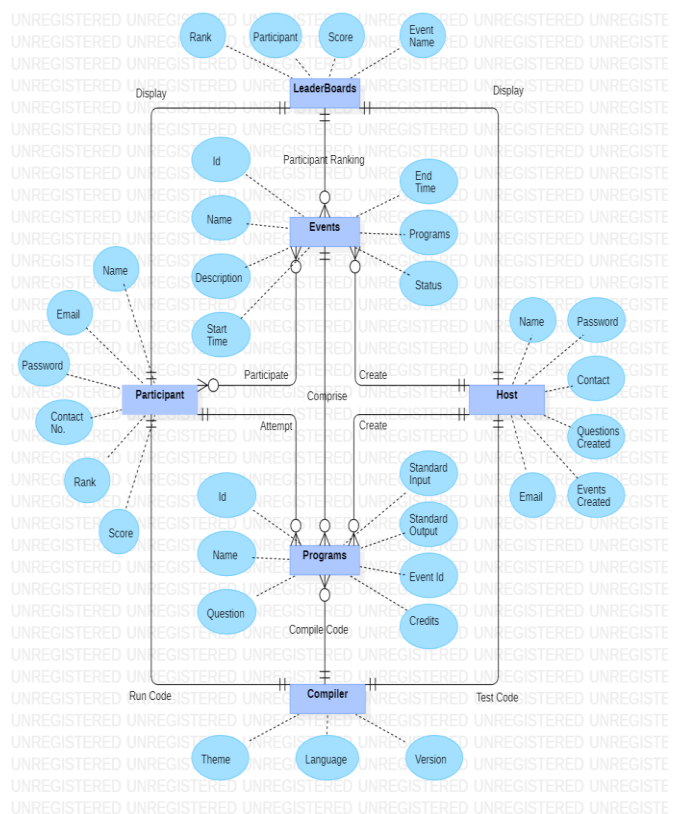
1) UI (User Interface)

Interaction with Code_Rush will be done through the browser i.e. via Website. This website will be directly linked to the server of that LAN. UI will be made in a way that it is easy to use and interactive in nature.

Through this UI users will decide whether they want to participate in events or create one. From there on the creators and participants will have their own separate interactive screen.

2) Database

The database will be essential because Code_Rush will want to store data related to users and events. We will be using a relational database to store the data. There are many ways in which we can have databases but for fast execution, we will use a local database.



3) The Server

The server will be at the center of these actions. The key responsibilities of the server will be to manage the flow of data and coordinate between different users. The choice of the server will be based on the type of operating system available in the lab. For Windows operating systems we can use WAMP Server (WampServer refers to a software stack for the Microsoft Windows operating system, created by Romain Bourdon and consisting of the Apache web server, OpenSSL

V. HOW CODE_RUSH DOES WHAT IT DOES.

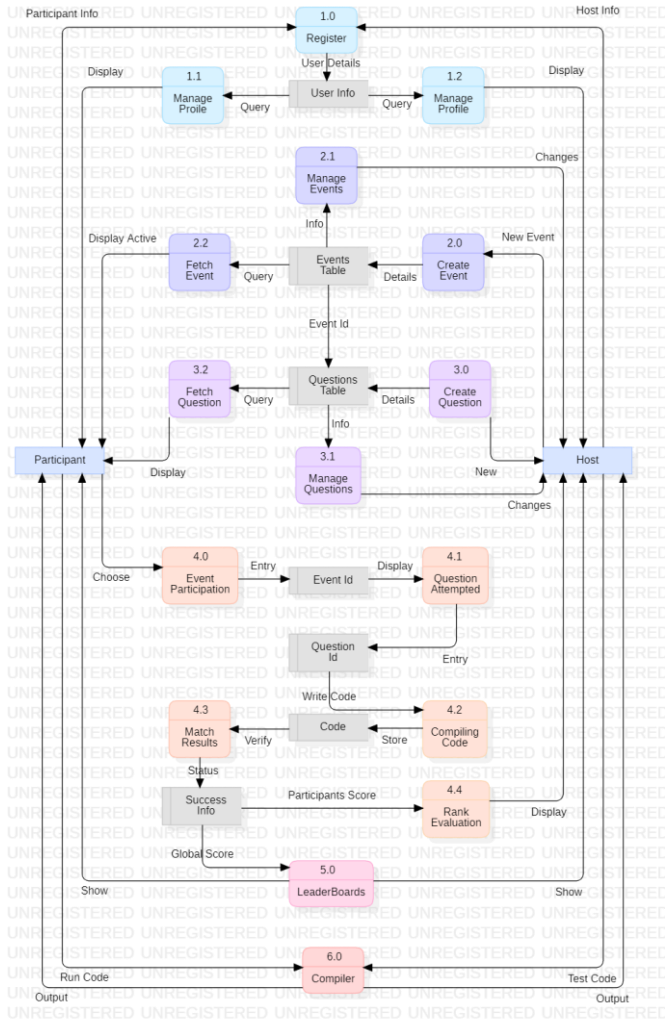
Code_Rush will be added to a LAN (Local Area Network) which can be easily built in a Lab of any institution. To make Code_Rush work we need a server in that LAN, this server will communicate to all the other devices and provide them UI (User Interface), from where they will interact with Code_Rush. The data sent from the user will be received by the server. The server will then decide what to do with the



for SSL support, MySQL database and PHP programming language.[4,5]) and for Linux based operating systems, we can use servers like LAMP Server (Linux Apache MySQL PHP Server). The server will have all the compilers installed. Other systems in LAN can also have compilers installed in them and collaborate with each other to give the results.

The server will communicate with the database whenever it decides to store data or retrieve some.

4) Dataflow Diagram



VI. IMPLEMENTATION

From all the research we did and solutions we found we actually tried, and we developed Code_Rush. In this session, we will see what Code_Rush looks like.

Code_Rush is built on a WAMP server which is installed on the server in the LAN. We have used Apache Server to Run Code_Rush.

Users can log in as a creator or a participant. The following is the area, where one can create events for participants.



Figure 1: Creating Event for Participants

Figure 1 shows how one can create an event. The area blue box marked 1 will contain the list of all the events created by a creator. The area under the box with making 2 will be used to add a new event to the list. Box marked 3 will have options to edit the event in focus or to delete it after an event is completed. The area under the box will show the options to see the leaderboard of this event. Area Under Box 4 is the link that will take him to the next page where he can add programs to its event.



Figure 2: Participants UI of live events.

Participants are greeted with a different page where they can see all the active events currently in LAN. Figure 2.is an example of a participant side UI. Participants will want to click on an event box and it will display the necessary information related to that event. If the event is not yet started then a timer will show the time left for its launch. After the launch of the event, participants can go further and code solutions for the problems.

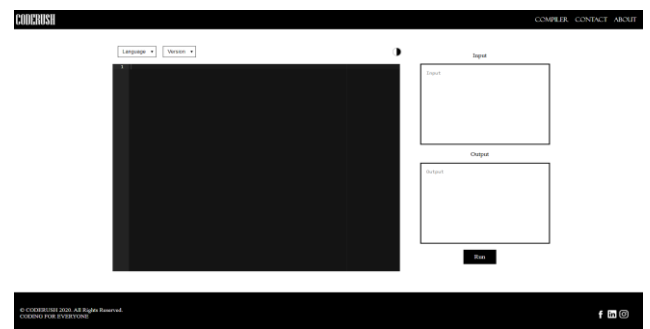


Figure 3: A view of Open Compiler.

Figure 3. Is the UI which has a coding area, dropdown menu to select the preferred coding languages, a text box for custom inputs and a button to run the code. Once the run button is pressed the code is sent to the server with inputs if any, and then the code is executed by the compiler. The compiler returns a result to the server which is then shown to the participant in the area allotted for output.

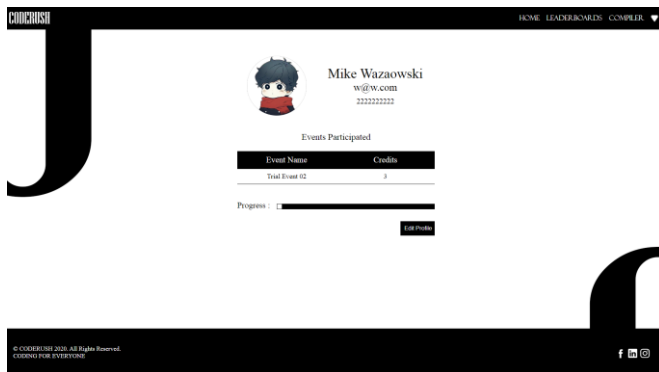


Figure 4: View of the Participants profile page

This page will show all the basic information of the user logged in. This page also has the list of events this participant has participated in. The user can also update his information through this page.



Figure 5: Leader Board of the completed event

For the creator, the leaderboard will be shown in a form of a table that will have all the information needed by them. The leaderboard is giving an insight into how their participants have performed in their event.

VII. LIMITATIONS

Android devices are too small to type code. To review your code, need to be physically present in the lab.

VIII. FUTURE WORK

Code_Rush the Project is still under development, and we have achieved so much. Code_Rush still has some work that needs to be done. Upon development, we will try to distribute the workload of the server to some computers in the network. This will increase the response time of the whole system and will make it fault tolerance. We still need to build up a library

of questions, which will help creators to make events more efficiently.

IX. CONCLUSION

Code_Rush is a project that counter the problem that is being ignored for a long time, the problem of taking computer practical's in an efficient way. This solution is just the beginning of making things better for everyone, there is still a lot of work and progress to be made.

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