

Code Compiler Shell

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Abstract - This is a one stop portal for all college students for coding, testing, compiling and debugging. Now a days it is common that students do need various compilers in one system to execute several programming codes of different languages at same time. This paper solves the problem of storage as well as portability of compilers. The user can compile the code without downloading the compilers from the internet, the controller decides which compiler to use and runs the code and gives the output to the user. The user responses are been stored as well as sent for assessment. These responses which are recorded help in build an interactive web portal for institutes for Practical Session. This is for a social cause. This project reduces the paper-based journal submission to online based journal submission.

Key Words: Compiler, debugging, submission, journal submission.

1. INTRODUCTION

Server based computing involves a large number of computers connected through a communication network such as the server. Online computing states the utilization of internet resources. Rather keeping data on your hard disk or an external storage drive or regularly update the compiler for your need, it is easy to run it over one place i.e. internet. For storage server can be efficiently used to store and retrieve the data whenever required.

We propose online compiler system as an online portal/Software as a service. A compiler transforms source code from higher level language to a machine understandable language (Low Level).

It is mainly done in order to create executable files which are then run for executing the program and its instruction.

Compiler structure can mainly divide into the three major tier/ various different sub-component.

1.1 The User Interface Tier: The user interface tier consists of the user interface and the database which is implemented using the server such as Microsoft SQL server, Linux Server. The user interface is hosted on the internet (IIS server), which help in providing the user to submit the code by typing. The mini projects in the forms of extension such as (.c

for C, .cpp for C++, .java for java and .py for python etc.) There are two types of user for this system i.e.

1. Guest user: (which can use services without registering but they do get value added services which the registered user gets). Guest user can only use the services such as running the code and getting the output.

2. Registered user: Registered users are those users who register with the system and gets valued added services. Following are the value-added services:

(A) Viewing of program history: The registered user is able to use the past history of all the programs they have executed.

(B) Viewing of program details: The registered users can see the details of the program that includes the program which have already been executed and submitted (codes and output) as well as compile and run status.

(C) Personal assessment of code: The codes which are executed by registered users are stored and sent to the respective subject in charge for assessment and grading of the code.

1.2 Controller Tier: The Controller Tier is used for managing the interactions between User Interface tier and Compilation tier.

The controller tier includes 3 subparts:

1. Compiler Server Management: It enables in adding new compilation tier servers and also viewing the status of the current compiler servers and it is used for removal of compiler servers. It also pings in alternate intervals to check the status of all compilers whether they are running in active state. In case it doesn't get any response, it is marked as faulty so that no program is assigned to it for execution in future, and already assigned programs are re-routed and assigned to other servers.

Scheduler Management: The work of scheduler is that it fetches the un-compiled program from the database and sends the program in compilation tier for execution.

Program Output Management: The receiver output server receives the compiled program from the compilation tiers server and stores the output in the database. The Internet

information server (IIS). Used in User interface Tier fetches the output from the database and sends it to web client.

1.3 Compilation Tier: The compilation tier consists of n number of compilers which are used for compile and execution of the programs. Each compiler server checks for the CPU usage as well as RAM before accepting a program to compile it, run it and generate the output. If the CPU usage and RAM is higher than predefined the required threshold value, then it rejects the program. On successful execution the generated output is sent back to the output server in the controller tier.

1.4 Problem Statement: Nowadays it is common that students need various compilers to execute several programming codes. This project deals with the creation of Integrated Development Environment (IDE) which allows user to code, compile and run the program in different languages using the browser-based IDE through the Internet and a web browser. The IDE will allow easy development and implementation. The users should register on to the system & manage their profiles and then user can code programs online & save the performed programs in their profile. The programs are then stored on the server and can then be compiled and/or executed depending on the language chosen by the user on the front end (IDE). After the assignment is uploaded by the teacher and it is code by student then the request is forwarded to the respective compiler. Multiple users can write programs in different programming languages and can also compile and run the program. After compiling the output is displayed along with it.

2. ANALYSIS

Technology reduces the time and effort of human. Current system involves a lot manual work which may or may not be prone to human error. Thus, if a system reduces this work load of students and teacher and could be accessible then it would turn the whole cumbersome and time-consuming objectives to the simple and technological objectives will be used. Student will login through their College ID. Once the login is successful, they are able to see an interactive shell provided on their dashboard. They are allowed to execute their respective practical. This interactive shell will support various programming language such as JAVA, C++, C. Thus, it will be a platform to execute and test the program code. Practical performed during the practical hour from department's lab will be stored in the database. If not performed from respective College IP then it won't save. While students can use the Interactive shell for practicing from home PCs. This stored database will be corrected by particular subject teacher. Thus, it will provide an Environment in which the use of paper is eliminated. Also, it will initiate students to do practical on their own.

As producing papers which are used in various ways we need around 24 trees to produce 1 ton of proper paper which is used for writing as well as printing. By using the

proposed system, we can reduce the use of paper up to 20% from the annual use.

2.1 Objectives:

- (1) **Reliable information access:** Common Database Management System for storing student's practical's data, consistent and accurate data.
- (2) **Avoid data and operational redundancy:** Modules access same data from the central database, avoid multiple data inputs that is repeated practical won't be allowed. If error in code then update/modifying the code is allowed.
- (3) **Cost reduction:** As practical's performed are stored in database which in turn eliminates the paperwork. Thus, no need of carrying manuals or journals.
- (4) **Time reduction:** Time saving, as the GUI will be user friendly it will be easy to control.
- (5) **Easy adaption:** Changes in the process are easy to adapt and restructure. That is if any new language is added on to the shell it will easily adapt it.
- (6) **Improve Maintenance:** Changes made in Database will be maintained properly and securely.
- (7) **User friendly environment.**
- (8) **Shell which can Compile, Run, Test and Debug the code easily.**
- (9) **Offering features such as command history and job control.**
- (10). **It will provide online practical hour submission.**

2.2 Scope:

This project has a large scope as it has the following features which helps making is easier to understand and modify.

- (1) Interactive shell is a web application which provides an online IDE (Integrated Development Environment) for college students to run the programs.
- (2) The main idea behind this project is to encourage students to perform the practical on their own, which in turn will help to sharpen their skills, better hands on programming and will increase logical thinking ability.
- (3) This software package can be readily used by non-programming personal avoiding human handled chance of error. This project is used by two types of users Students and Teacher.
- (4) Students have their own accounts and can perform practical's and store it in their respected database.

(5) Respected Subject Teacher will login through there College ID and will check those practical.

(6) New features can be added as per requirements.

3. DESIGN

The design contains 3 Main components/ Model. They are Student, Teacher, Admin. Here is the complete flow of the project through a flowchart:

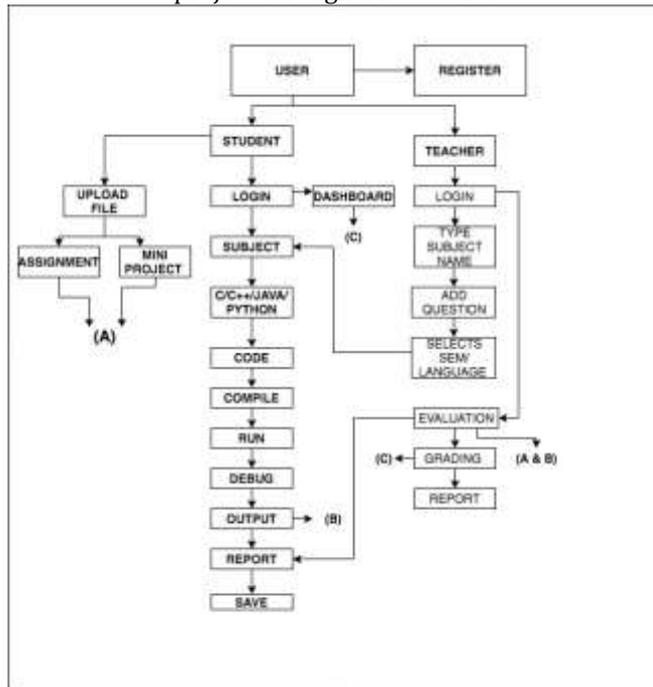


Figure 1: Overall Flowchart

The three main components of the model function in specific way. The Admin creates the accounts for Teacher and Students. The Registration form contains basic details such as email id, Name, Semester, Role (Teacher/Student), Batch (A/B/C/D), batch and semester columns are specific to students only. If the admin selects the role as teacher, the columns for the same are hidden as teacher can teach more than one class. The admin creates a temporary password for teacher and students in initial stage. Later it can be changed, by the respective personal. Once the accounts are created successfully. The student can login to the account as soon as its logins to the account students find three tabs in the header one is a Dashboard containing the assignments to be completed, next is Report as soon as student finishes one assignment it is send for Evaluation and Grading, as it is done the respective scores be displayed in the report section with the assignment id, and the last one is sign out which indicates that the student has successfully logout. The Teacher's side the page contains Evaluate when in all the submitted assignments from students are seen and which are pending for evaluating and grading, next is Create Assignment in this the teacher can create assignments for individual batch, semester it also includes question format wherein they can type the question and select the format of

answer i.e. Documents or programming language (C, C++, Java, Python) after submitting this it is sent to student's dashboard for completion, next is report the teacher also the copy of the grade sheet which they have given, it can be sorted by semesters and subject.

Breaking down the individual process of the system in form of algorithms for better understanding of the system

(A) Login Algorithm

- (1) Fetches Email Id.
- (2) Fetches Password
- (3) If the password=1,
(yes) then: Redirect to dashboard/ Homepage (T/S)
(No) then: Check and display what is incorrect/check
- (4) If user exists.

Make changes (corrections) then it will redirect to

Dashboard/Homepage (T/S)

(B) Add User:

- (1) Admin clicks on to create user
- (2) Takes the email id, name, password.
- (3) Takes the role
- (4) If role== student

then, Takes the class group, semester and creates account else, Hides the class group and semester button and creates account

(C) Update Password:

- (1) Ask Email id
- (2) Ask old password
- (3) Checks in database
- (4) if p== old password

Then, Let the user create/change the password and redirect them to home page. Else, show wrong password and do not allow to change.

(D) Add Assignment:

- (1) Teacher Login to account
- (2) Select subject, semester
- (3) Selects the class Group

(4) Selects the Language in which the student has to perform/Selects document in case of assignment or (Theory) Assignment to submit

(5) Writes the questions in the question block and hits create to submit the questions to students.

(6) The assignment is stored in DB and sent on to Student's dashboard.

(E) Submit Assignment:

(1) Fetches details from the student login (Email, password, semester, class group)

(2) Checks in database if teacher has uploaded. Assignment for that group and semester.

(3) If given, solves it and clicks on submit goes to the database and go to evaluate side of the teachers.

(4) If not given, displays woohoo! No assignments to Complete

(F). User Interface:



Figure 2: Homepage / Login screen



Figure 3: Admin Screens



Figure 4: Work Dashboard (Student)

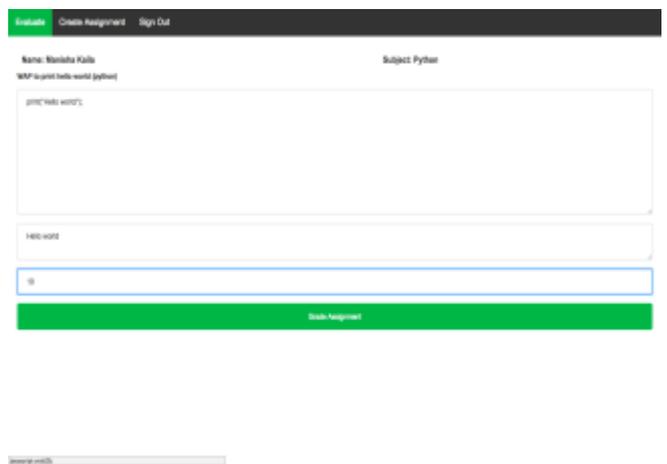


Figure 5: Work Dashboard (Teacher)

| ID | SUBJECT | SCORE |
|------------------|---------|-------|
| 1111111111111111 | Python | 10 |

Figure 6: Report Student End



Figure 7: Change Password

4. CONCLUSION

This is an innovative project based on ERP/ Software development which will be used in institute for the online practical submission and evaluation making the journal submission paperless and consuming less time. The purpose of this project is not just collecting and storing the practical data from the students, but also to allow students to apply their skills. It is beneficial for the student as time will be saved in doing paperwork. They will be able to focus more on programming and learning new technologies. This shell will be able to make teacher student interaction more effective as students will approach teachers for help and queries about the practical. Code compiler shell will make this whole process of learning, storing, a super easy with the automation of each and every process that is related to the knowledge.

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