An Implementation Paper on Design and Development of Programming Class Editor Desktop Application

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ABSTRACT: *In most of the coding practical lab in colleges there are more than 30-40 students writing on practicing their codes on their PC. There is a single invigilator to keep an eye on the students. The invigilator has to go to individual students to check their code to clarify their doubts. To check 20 students individually is a very tedious job for the invigilator. To solve all the problems we proposed Programming Class Editor on Cloud Computing project. In this project we have two desktop applications. One for the invigilator and one for the students. Both the application also has are connected over the Cloud Computing. This applications also has a messenger inbuilt in them. The invigilator gives the assignment or the coding problems through his application to the students. The students solve the problem and submit it to the invigilator through their application. This helps the invigilator to review code and clarify the doubts of the students with the help of messenger without going to them individually.*

The purpose of this research is to design and develop a real-time code editor application. The application main features are providing workspace to make, execute and build the source code, real-time collaboration, chat, and build the terminal. This application supports C, C++, and Java programming languages. Java used for the developing the windows application.

Introduction: We are living in an era where we can do everything using technology. From having an own personal assistant to sending cars to space. But even in this time we are still using that same old teaching methodology to conduct classes in coding practical labs. We know it is practically very tedious for the lecturer or invigilator, to review given assignments to the students. As a result of this the lecturer is not able to give attention to each student and due to this their doubts, problems do not get clarified which affects the development of the Programming Skill of the Students. In this work, we propose a Programming Class Editor on Cloud Computing. This is achieved by using Cloud, which is nowadays readily available in practical labs. In this project we have two desktop applications. One for the invigilator and one For the Students. Both the applications are connected over the Cloud.

This application also has a messenger inbuilt in them. The invigilator gives the assignment or the programming problems through his application to the students. The students solve the problem and submit it to the invigilator through their application. This helps the invigilator to review code and clarify the doubts of the students with the help of messenger without going to them individually.

Recently, due to digitization in every field a lot of things are moved online so we have a lot of systems available through which can arrange classes, meetings, etc in online mode. One of the technologies used for instant collaboration is single IDE (like pair programming). Pair programming is the practice of having two programmers access and work on the same code in a single development environment. In pair programming, programmers have the abilities to create, edit and delete source code in real-time. Pair programming could solve the synchronization problem of program code in order to remain valid, and whenever the code changes any programmer who is working on the same project could see the one who changed the code.

1.1 Problem Statement

We know it is practically very tedious for the lecturer or invigilator, to review given assignments to the students. As a result of this the lecturer is not able to give attention to each student and due to this their doubts, problems do not get clarified which affects the development of the Programming Skill of the Students. In this work, we propose a Programming Class Editor on Cloud Computing. This is achieved by using Cloud, which is nowadays readily available in practical labs. In this project we have two desktop applications. One for the invigilator and one For the Students. Both the applications are connected over the Cloud.

There is a single invigilator to keep an eye on the students during practical class. The invigilator has to go to individual students to check their code or to clarify their doubts. It's difficult to check the code for an invigilator to check the every student code manually during class hours.

Due to digitization in all fields, a lot of things are moved online, so we have a lot of systems that can organize courses, meetings, etc. in online mode. One of the technologies used for instant collaboration is a single IDE (like pair programming). To solve all the above problems we proposed the PCE (Programming class Editor).

1.2 Our Approach

There is a single invigilator to keep an eye on the students during practical exams. The invigilator has to go to individual students to check their code to clarify their doubts. Moreover those students who complete their practical early have to wait for the exam to get over. The following are the features of the project. This application helps to create and see the result of the executed source code by terminal. Every student and teacher can chat globally through the global chat option. The teacher can see the code of all the students present in the class. Teachers can also clear doubts of students through one to one or private chat applications. It will support C, C++, JAVA, PYTHON, etc programming languages.

Due to digitization in all fields, a lot of things are moved online, so we have a lot of systems that can organize courses, meetings, etc. in online mode. One of the technologies used for instant collaboration is a single IDE (like pair programming). Pair programming is the practice of having two programmers access and work on the same piece of code in a single development environment. In pair programming, programmers have the ability to create, modify, and delete source code in real time. Pair programming can solve the problem of synchronizing the program code to keep the same value, and whenever the code changes, any programmer working on the same project can see who has changed code.

The following are the features of the project.

i. This application helps to create and see the result of the executed source code by terminal.
ii. Every student and teacher can chat globally through the global chat option.
iii. The teacher can see the code of all the students present in the class.
iv. Teachers can also clear doubts of students through one to one or private chat applications.
v. It will support C, C++, JAVA, PYTHON, etc programming languages

1.3 Methdology

Login & SignUp (Teacher and Student)

Login & Signup to access the application more easily and integrate with social network to collaborate each other. Application supports C, C++ and Java as programming languages that users can choose as a main programming language. Users can run and build program to find out the results of the code program. Users can download the source code program along with their parent folders that has been created. Users can do collaboration to create a project together with other user in real-time. Users can communicate with other users who exist in the same project using chat as media. Users can send email to ask something or inform about bugs present in the website.

Home Page, Profile Page, About Section

Home page contains a list of subject available. In teacher Application the teacher can add, delete the subjects, In Students application the student can get the list of subject from which they can goes inside the code editor, In profile page they get their profile details. Inside About section they get information about the project and developers information.

Code Editor Application

There are also a wide variety of web-based systems that provide collaboration. For example is EtherPad that allows real-time text editing. Ace, CodeMirror are web-based text editing component which designed to be embedded into the IDE or application. Project or software development requires the coordination and collaboration between programmers, so that the collaboration systems are very useful to improve the efficiency in making project. The effectiveness of collaboration in programming can improve the productivity and quality of project or software.

Messenger

Messenger is merging of communication and collaboration systems, which combines communication technologies, like instant messaging, and various collaborative application. Web Socket technologies consist of four interconnected building blocks; consist of unified communications, presence awareness, contextualization and E-Collaboration portfolio.

API (Teacher and Student)

In this project there is backed of spring boot which provides an API for both the application where we provide user authentication.

Authentication module

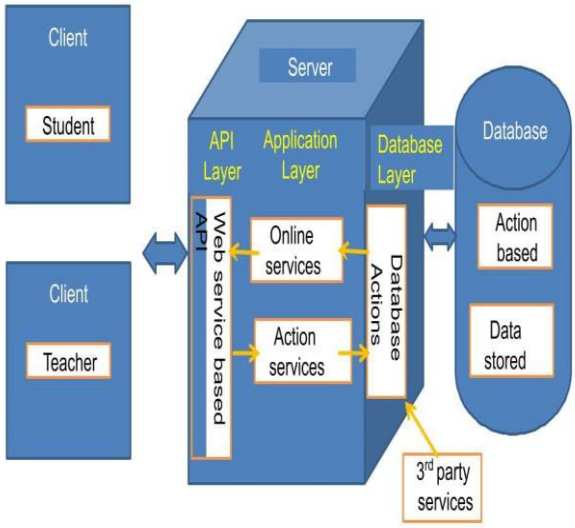
The purpose of the authentication module is to provide security. It is the entry module of the application. Each user enters his/her valid username and password to enter into the application. If the username and password is matched, the application gets started or the login is done successfully.

Database module

The database module will contain all the information about the login time, date, with their image on the server. On this basis, the admin can calculate the salary. The capacity of this module is to produce the rundown of employee that who all are logged IN then the admin can download the list from the database. Generated data is in large amount so the must be large space so we will first compress the data using data compression technique and then load to the database.

a. **Data compression**
As we storing employee data in the admin database, along with his location and image also other information. The application needs large amount of storage we used the data compression technique.

b. **Data decompression**
it has to be in decompressed format for easy reading. So at the time of downloading this file the file automatically decompressed.



Conclusion And Result

The main features of the application is to provide workspace to create, execute and build the source code, real-time collaboration between teacher and all students, chat and build the terminal to execute code. Helps the teacher view the code on their computer screen without having to go to each student's computer screen.

This introduced our design and implementation of the real-time application for collaboration. Programming Class Editor on Cloud computing is an application that helps students and teachers to create and see the result of the executed source code by terminal, collaborate in real-time with the other

programmers by chat or invite to join the same project such as import, export, shared projects. Coding Class Editor on cloud supports C , C++, java programming languages. Programming Class Editor has the main features: Provides workspace to make, execute and build the source code, real-time collaboration, chat, and build the terminal.

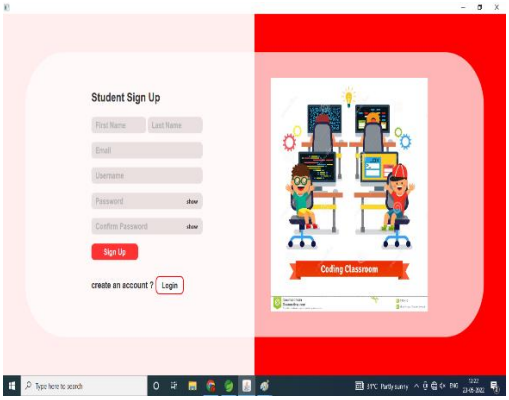


Fig. 1 Student Signup

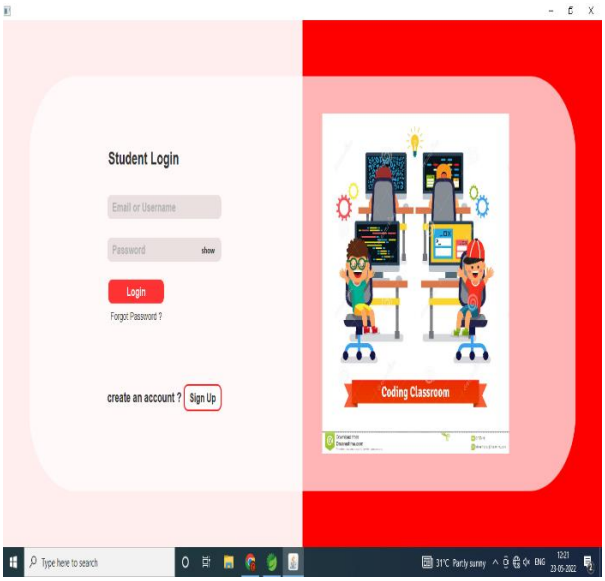


Fig. 2 Student Login

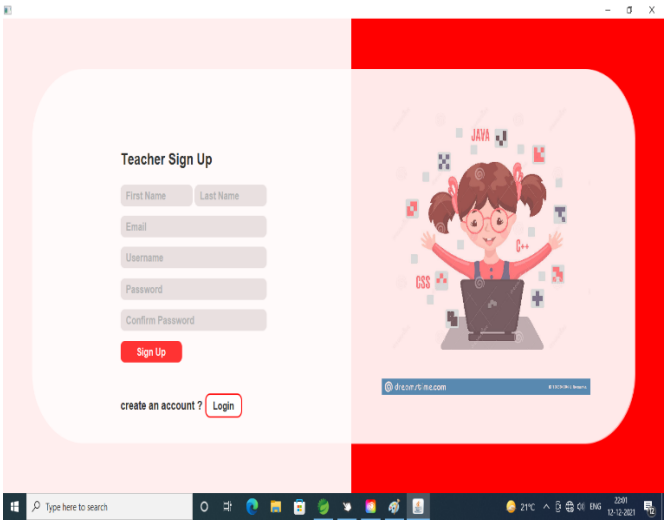


Fig. 3Teacher Signu

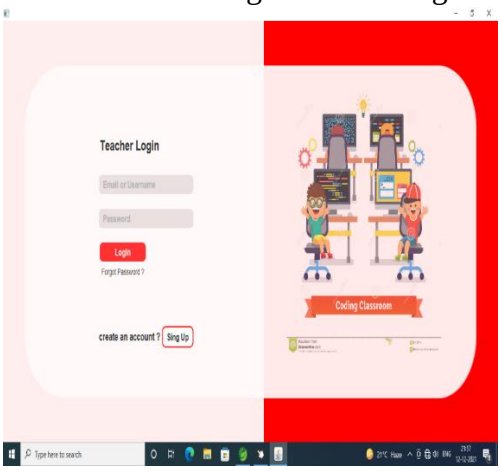


Fig 4 Teacher Login

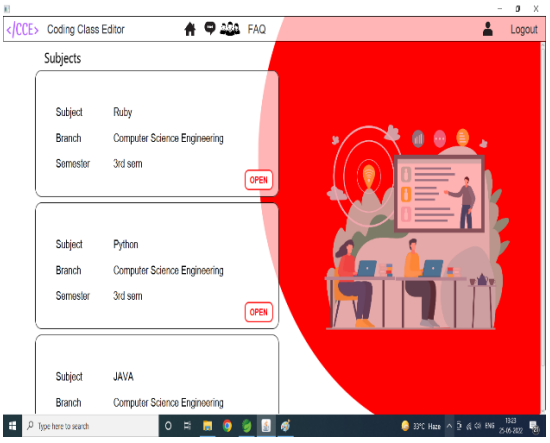


Fig 5 Student Home Page

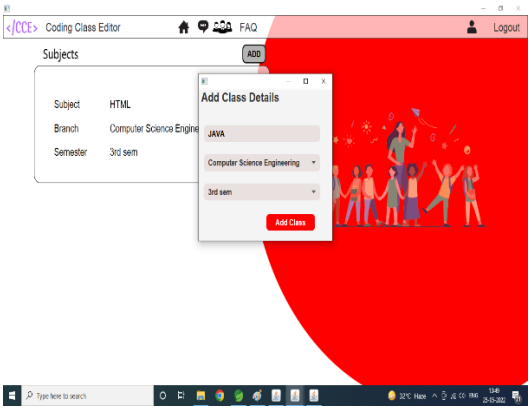


Fig 6 Teacher Home Page

Fig 7 Teacher Profile

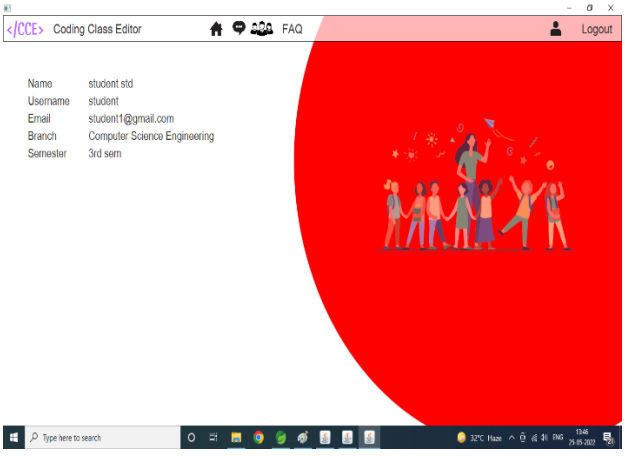


Fig 9 Student Profile

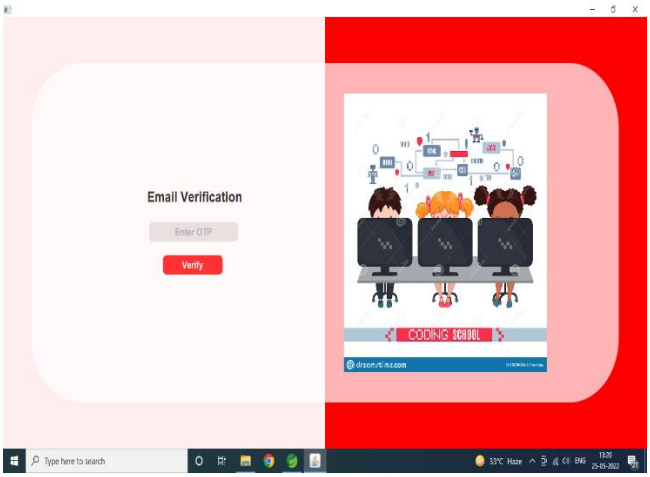


Fig 10 Email Verification

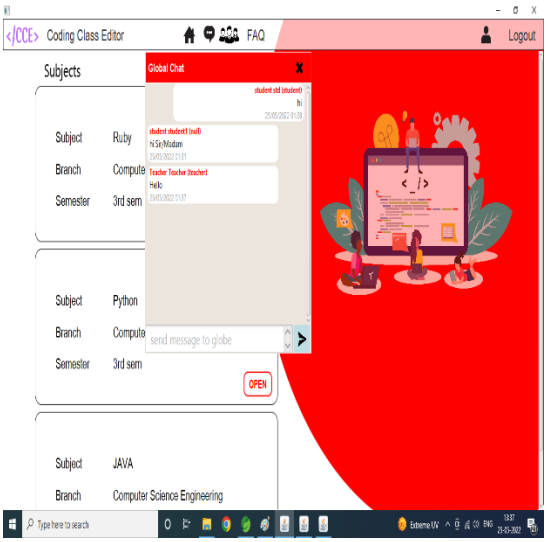


Fig 11 Globe Chat

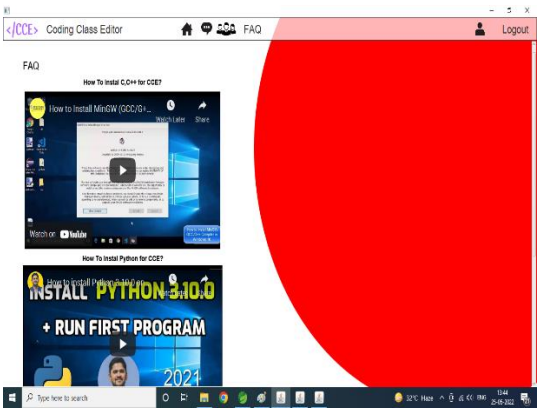
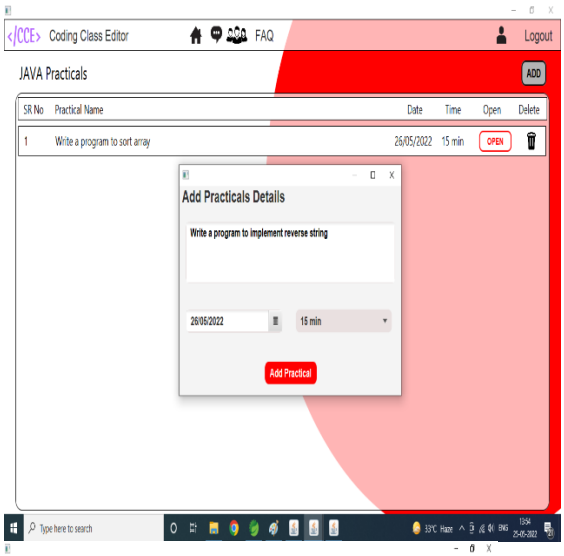


Fig 12 FAQ Section



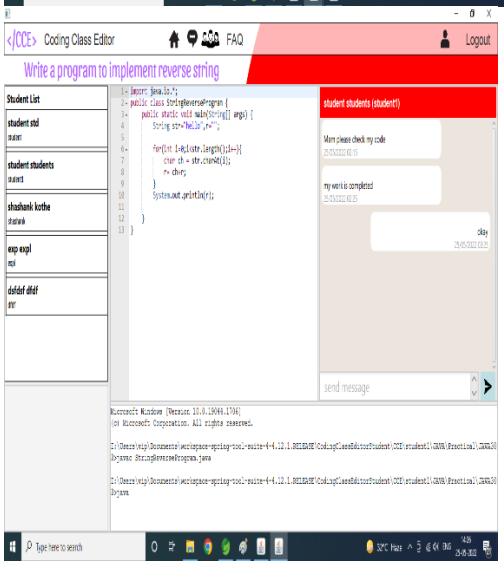
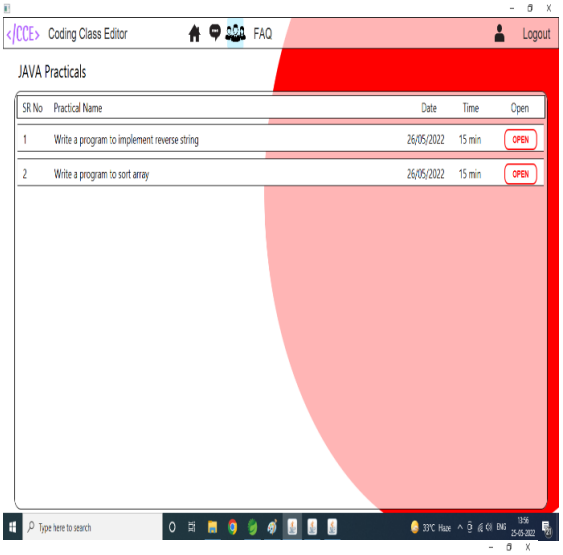


Fig 14 Teacher Practical Screen



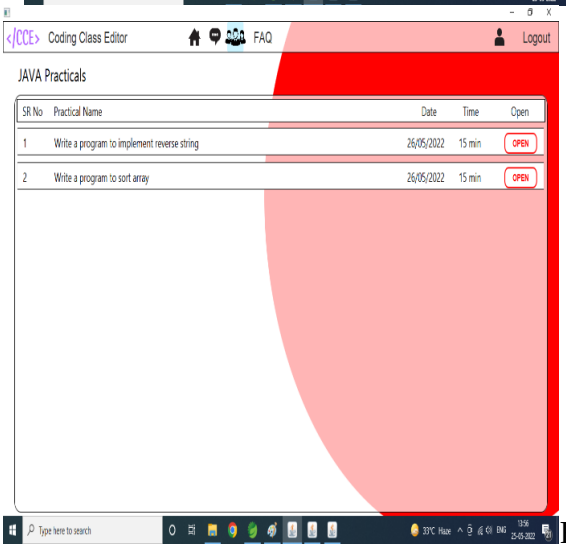


Fig 15 Student Subject Screen

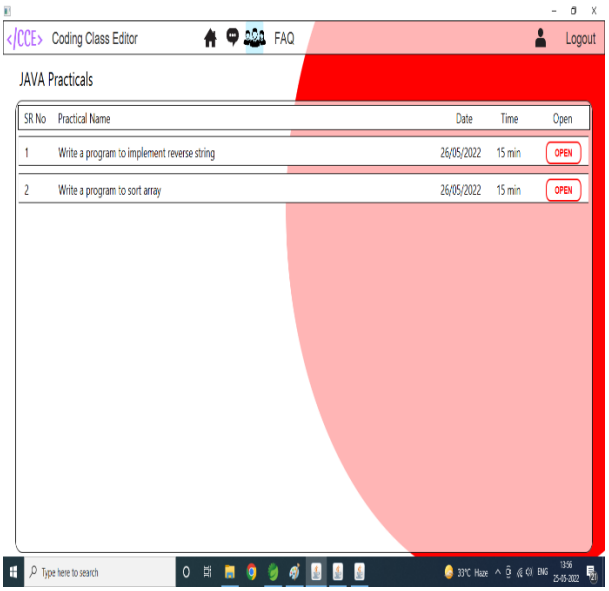


Fig 16 Student Practical Screen

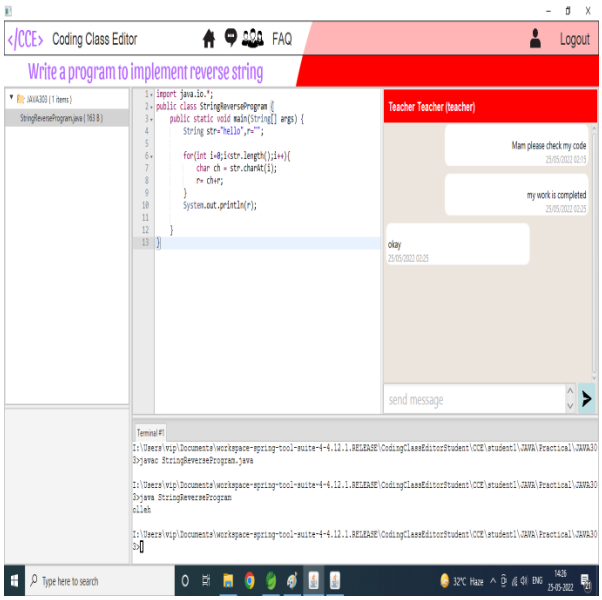


Fig 17 Student editor screen

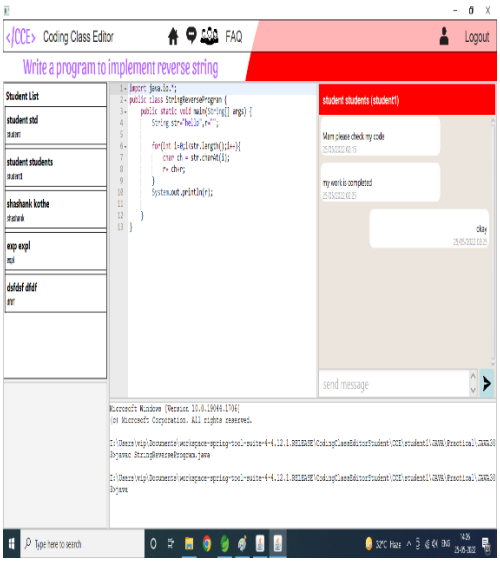


Fig 18 Teacher editor screen

Reference

[1] Mr. Tushar Indorkar, Mr. Shivam Patil, Mr. Gaurav Katkar, Mr. Swapnil Verma, Ms. Shruti Sahare, Ms. Pratiksha Ramteke, ”Coding Editor”,IJARIIE-ISSN(O)-2395-4396, Volume No 2, Issue No 1, pp-xx, May (2022)

[2] Mohammad Ali Nawab, Tavisi Malpani, Tushar Kaundal, Teena Verma “ONLINE CODE EDITOR WEB APP” e-ISSN: 2582-5208 Volume:03/Issue:12/December-(2021).

[3] Surya Chandra. V, Durga Charan. K, Sudha Rani. P, “ONLINE C, C++ & JAVA COMPILERS USING CLOUD COMPUTING”, IJCSMC, Vol. 4, Issue. 8, August (2020)

[4] Aditya Kurniawan, Aditya Kurniawan , Christine Soesanto, Joe Erik Carla Wijaya “CodeR: Real-time Code Editor Application for Collaborative Programming” volume 59/ (2019).

[5] Arjun Dattal, Amab Kumar Paue, “Online Compiler as a Cloud Service” Volume 40, (2019).

[6] Warangkhana Kimpan, Theerasak Meebunrot, Busaya Sricharoen “Online code editor on Private cloud computing”, IEEE Xplore,(2018).

[7] Sonali R. Gujarkar, Samprada D.Nimrad, Shital Meshram “Server Based Code Editor” EISSN: 2349-7610 INTERNATIONAL JOURNAL FOR RESEARCH IN EMERGING SCIENCE AND TECHNOLOGY, SPECIAL-ISSUE-1-JAN-(2017)

[8] Jasmeet Chhabra, Shubham Bhatia,

Vaibhav Kamal Nigam, Rashik Bhasin “Online Code Compilation using Cloud Computing” /Volume:03/ISSN: 2395-0056 (2016).

[9] H. B. Salameh and C. Jeffery, “Collaborative and social development environments: a literature review", International Journal Computer Applications in Technology, Vol. 49, No. 2, (2015).

[10] Bau,D.A.Droplet,ABlock-Based Editor for Text Code.journal of computer science in colleges.30,6(june 2015).