Online Integrated Development Environment

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Abstract: For the last few decades, web applications and web based tools provide an automated way for supporting many useful services. Among them, web based compilers and output generators provides user many important functionalities like zero install, saving time, online storage ,etc. The prime objective was to provide as good services as the desktop application. But the existing applications lack in a few things like very few database support, project/file management, backup, etc. We have developed backbone IDE, a web based compilation and output generator to overcome these drawbacks and provide an efficient run time environment for the users. Also this IDE provides multiple database support for the scripts written by the user along with the portal for learning purpose which includes documents in the form of portable document format (PDF), power point presentation (PPT) and videos**.** The application mainly provides user, the capability to execute their scripts without having the overhead of installing or configuring any of the required platforms.
Keywords: Online integrated development environment, web based compilation, web based output generator

I. INTRODUCTION

Now-a-days the web based applications and web based tools are very popular among the people. These applications provide many useful and automated services to the user. These applications cover many fields like education, medical, engineering, shopping, entertainment, etc.As Integrated Development Environment (IDE) typically focus on browsing static source code, they provide little help in revealing the execution paths a system actually takes at run time. Being able to reconstruct the execution flow of a system while working in the IDE can lead to better program understandingand to more focused navigation in the source code. The developers can more efficiently maintain the code in the IDE if the static views of the IDE are augmented with dynamic information.

For last few years the inception of web based IDE's have taken the center stage in IT industry. The desktop IDE's like netbeans, eclipse are very popular among developers, tester, teachers as well as students. Along with these, came the web based IDE's like tutorials point, jdoodle, ideone, etc. They provide more efficientsoftware development than desktop IDE's. There is no need of installing the IDE on the desktop, we can work online and it saves time and memory as well as human efforts for installation as user need not to install all the development kits on the desktop.

II. BACKGROUND

There are existing online IDEs available on the web like codecef , jdoodle, c++ shell, codepad, ideone, etc. along with some learning websites which provides this as an additional feature like w3school, tutorials point, etc.

1. Advantages and Disadvantages of Existing Online IDEs

1.1 Advantages
   A. Zero-install
   B. Saves time and efforts
   C. No overhead of manual configurations
   D. Multiple language support

1.2 Disadvantages
   A. Few database support
   B. Few offering backup
   C. Fixed template format
   D. Less security

2. Proposed System

The proposed system will have an interactive user interface for both users andadmin. It has a learning portal for various documentations for learning purpose. AnAPI which will be communicating with all server components and the user interface. And the server side implementations of installing and initializing the server components like web server, compiler, interpreter, database management system tools,etc.

2.1 Goals Of Proposed System
    A. To overcome drawbacks of existing system
    B. To provide user with various database options
   C. To provide online storage

3. Objective
    A. To provide compilation and output generation capabilities to the user.
    B. To provide run-time environment to the user.
    C. To provide multiple database support.

## III.   SPECIFICATION

1. Architecture

The architecture comprises of three well known layers namely presentation layer, service layer and database layer. The presentation layer has user interface for adminas well as user. The service layer consists of all the software's required and an API which will communicate through all the components. The database layer will consist of all the databases and it will also communicate with the storage.
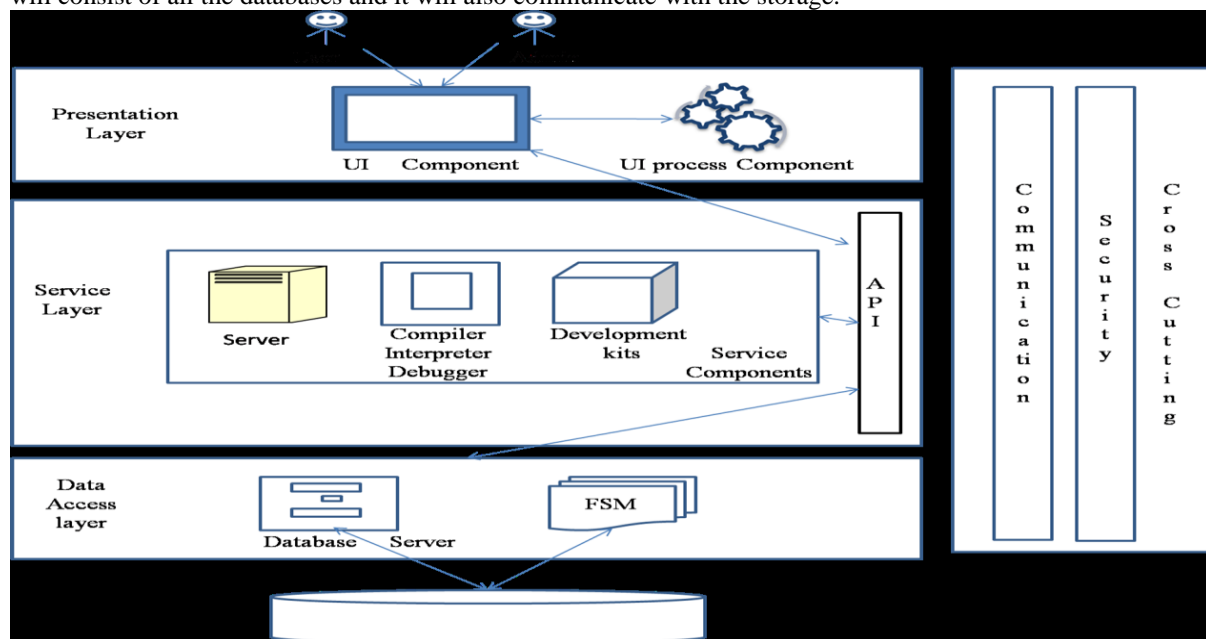
2. Working

The basic working of the system will be as simple as that of any other web application. The client will communicate with the application via web browser on the client side. The script user will generate will be sent to the server side where it will get compiled or interpreted according to the language and the database queries will be sent to the database servers and the collective result of the script will be givenback to the user on the interface provided to him.
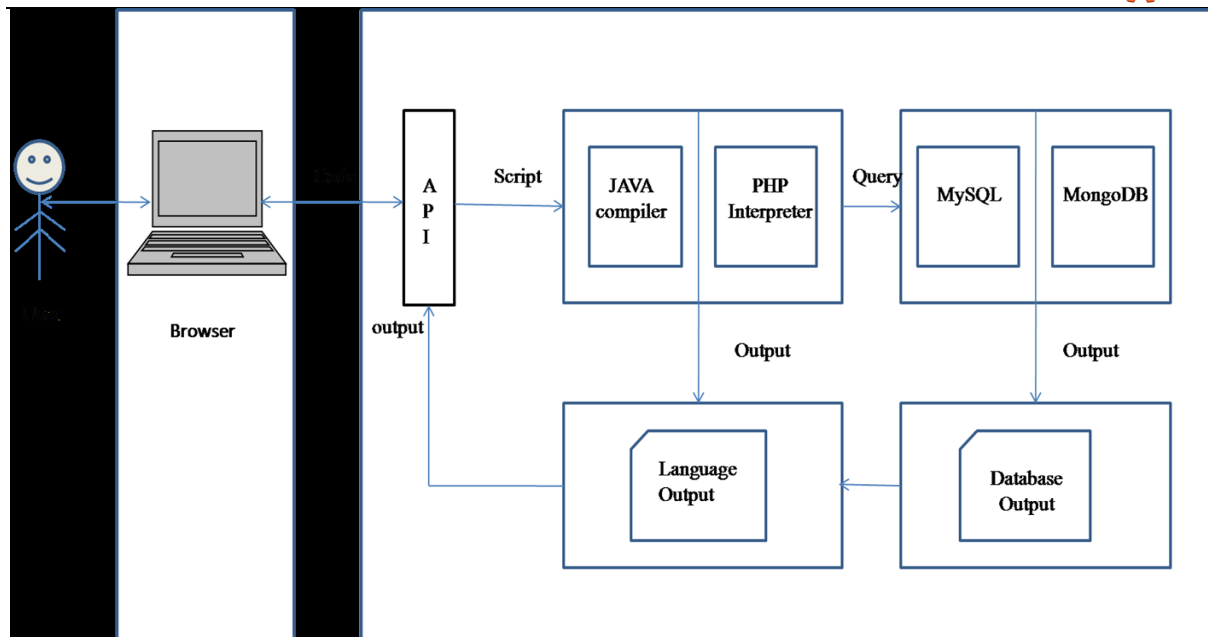
3. Hardware and Software Requirement
3.1 Software Requirements
    A. Apache Server 2.4
    B. Netbeans 8.0.2
    C. MySQL 5.7
    D. mongoDB 3.2
    E. JDK 8
    F. PHP 7

3.2 Hardware Requirements:
    A. Compute Machine with minimum 5GB storage

3.3 Front End
    A. HTML
    B. PHP
    C. JavaScript
    D. CSS

3.4 Back End
    A. MySQL

IV. INDENTATIONS AND EQUATIONS

1. Mathematical Model
An automaton (Automata in plural) is an abstract self-propelled computing device which follows a predetermined sequence of operations automatically. An automaton with a finite number of states is called a Finite Automaton (FA) or Finite State Machine (FSM). In NDFA, for a particular input symbol, the machine can move to any combination of the states in the machine. In other words, the exact state to which the machine moves cannot be determined. Hence, it is called Non-deterministic Automaton. As it has finite number of states, the machine is called Non-deterministic Finite Machine or Non-deterministic Finite Automaton. An NFA is represented formally by a 5- tuple, $(Q, \sum, \delta, q0, F)$, consisting of a finite set of states Q, a finite set of input symbols $\sum$, a transition function $\delta : Q \times \sum P(Q)$, an initial (or start) state q0 $\square$ Q, a set of states F distinguished as accepting (or final) states F $\square$ Q.

2. Algorithm
- Step 1: User logs in to the application.
- Step 2: User creates new project.
- Step 3: User writes the program code.
- Step 4: User compiles the program.

- Step 5: If program compiled successfully go to step 6 else go to step 3.
- Step 6: User executes the program.
- Step 7: If executed successfully go to step 8 else go to step 3.
- Step 8: The application displays the output.
- Step 9: If user wants to continue coding go to step 3 else go to step 10.
- Step 10: User logs out of the application.

3. State Transition diagram
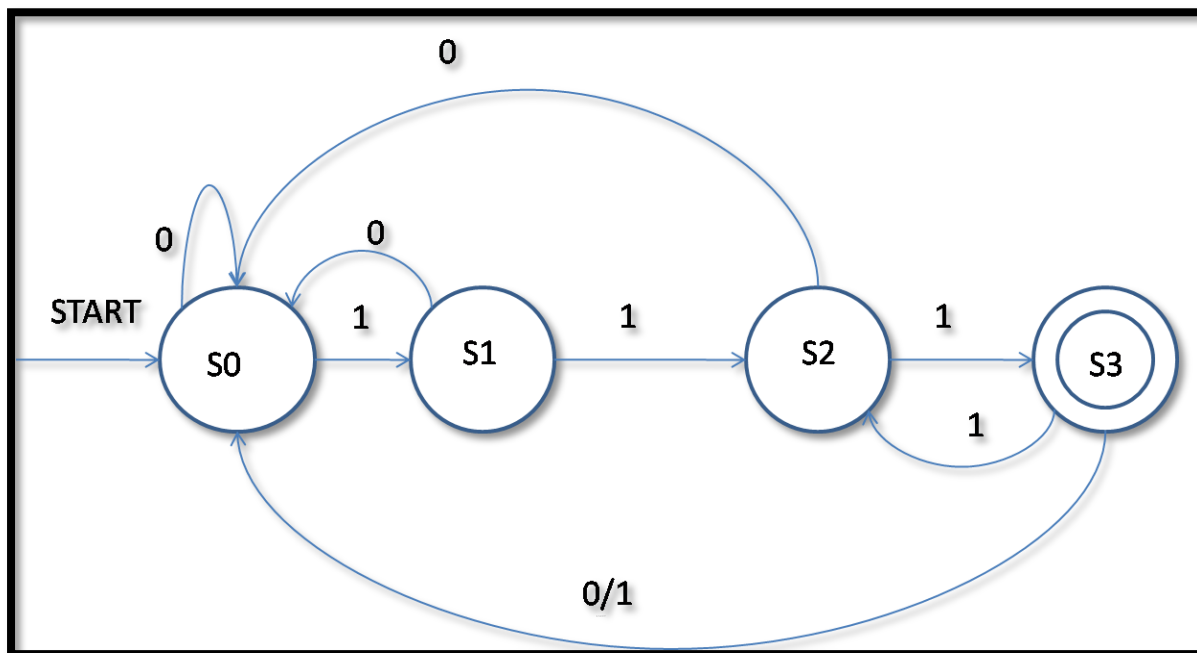
Q = {S0,S1,S2,S3}
Where,
S0 = Program Writing State
S1 = Compilation State
S2= Execution State
S3= Output State
∑ = {0,1}
Where,
0 = Error or Exception
1 = Successful Processing
δ: Q x ∑ P(Q).
q0 ⬚ Q
F = {S3} and F ⬚ Q.

V.   CONCLUSION

We studied and surveyed of various web based IDE's and came to know that, there is a need of an online IDE which should provide support for multiple languages and databases with efficient user interface and online backup. Thus we developed BACKBONE IDE consisting of user interface for code editing and output generation as all IDE's does along with multiple database support. It also consists of a file server and the database servers for backup and database utilities respectively.

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