Integrated Development Environment for C Language

Ajinkya Bhise[1], Haresh Nanarkar[2], Namoha Lutharia[3,] Rahul Khandekar[4], Prof. Sonali Jadhav[5]
Department of Computer Engineering[1, 2, 3, 4,5]
MCT Rajiv Gandhi Institute of Technology Mumbai-53[1, 2, 3, 4, 5]
Email: ajinkya.bhise@gmail.com[1],hareshnanarkar@gmail.com[2],inamoha@gmail.com[3],rrk1831@gmail.com[4],
sonali.jadhav@mctrgit.ac.in[5]

Abstract-An Integrated Development Environment (IDE)basically is a computer software which consists of a source code editor, aninterpreter and/orcompilerand a debugger as well. The objective is to develop an IDE to improve learning efficiency of the beginners as well as helpful tool for the professionals by making it more user-friendly and it will present a single program where all the development is done which further results in greater productivity. One more reason to develop this IDE is that we all know that there are many platforms for many languages like Eclipse for Java, Visual Studio for C# but there is no such interactive and graphical enhanced IDE for C language. This interactive IDE provides a platform for programming developers to develop applications on language C and also help to reduce the cost of programmer cultivating and shorten the time of technological learning. Ideally, use of an IDE results in greater productivity as it presents a single program in which all development is done. Languages like C are the basis course in colleges and universities now. Many students are using TurboC for developing applications which leads to low learning ability of the beginners as the visualization is poor, the operating is not convenient, errors are not found and understood easily and development functions are expanded difficulty.

Index Terms -Integrated Development Environment (IDE), GNU Compiler Collection (GCC), Intellisense.

1. INTRODUCTION

Use of an IDE results in greater productivity as it presents a single program in which all development is done. Programming Languages like C are the basis course in colleges and universities now. Many students are using TurboC for developing applications which leads to low learning efficiency of the beginners as the visualization is poor, the operating is not convenient, errors are not found easily and development functions are expanded difficulty. An IDE (Interactive Development Environment) is computer software which basically includes source code editor, a compiler or interpreter or both, build automation tools and a debugger and provides comprehensive facilities to the programmers for the development of the software. The objective function to develop an IDE is to enhance learning efficiency of the beginners as well as helpful tool for the professionals by making it more interactive and it will present a single program where all the development is done which further results in greater productivity.

1.1. *Problem Statement:*

There are many platforms for many languages like Eclipse for Java, Visual Studio for C# but there is no such interactive and graphical enhanced IDE for C language. An IDE is computer software that provides comprehensive facilities to the programmers for the development of the software. It generally consists of a source code editor, a compiler or interpreter or both, build automation tools and a debugger. Ideally, use of an IDE results in greater productivity as it presents a single program in which all development is done. Languages like C are the basis course in colleges and universities now. Many students are using Turbo C for developing applications which leads to low learning efficiency of the beginners as the visualization is poor, the operating is not convenient, errors are not found easily and development functions are expanded difficulty.

1.2. *Objectives:*

Our main aim is to develop an Integrated Development Environment (IDE) for C language. This IDE will provide enhanced features that will ease the programming task for software developers. This interactive IDE provides a platform for software developers to develop applications on language C and also help to reduce the cost of programmer efforts and shorten the time of technological learning. The main objectives of our project are:

(1) Flexibility – flexibility because it is not going to be just a editor but provide other functionalities like error checking, suggestions, error highlighting ,flowchart maker etc.

(2) Performance- The response time of the IDE remains stable even if load increases on the machine. So the IDE is scalable.

(3) Simplicity-The IDE is simple to use and learn which provides faster learning ability.

(4) Platform Compatibility and Portability-The IDE can be used on different platforms like Windows and Linux by installing all appropriate dynamic link libraries (dll) which are mandatory for this software.

(5) User Friendly – The IDE is developed using standard naming conventions. It also has many features like intellisense, suggestions etc. which makes it user friendly.

1.3. *Scope:*

The scope of this IDE is restricted to only C language. This IDE will ease the programming experience of developer who wants to write program in C language. However, this IDE can provide support for other programming languages.

2. LITERATURE REVIEW:-

The research paper, 'Design and Development of Integrated Development Environment with Data Prefetching and Complexity Parameter 'by Parul*, Jagandeep Sidhu published in International Journal of Advanced Research in Computer Science and Software Engineering in Volume 4, Issue 11, November 2014, documents the information about an Integrated Development Environment and how the data prefetching works within. The detail process exhibits the design of the IDE and displays the main components. The data prefetching helps in predicting the future data access and then fetches it before the processors makes a request for it. It then concludes with the features an IDE provides such as the editor, compiler, error detection etc.

3. PROPOSED SYSTEM

The initial view of the system will display a window asking for select a project which is either existing or create a new one. Once the user makes a choice he will further see couple of windows and toolbars. According to the initial plan there are going to be 4 main windows and few toolbars. The toolbar will consist of standard options in the form of button such as run, save, new , open, undo, redo, debug, help etc. The windows namely are:
(1) Project/folder window

(2) Error and output window

(3) Mode window

(3.1) Flowchart

(3.2) Theory

(3.3) Programming

(4) Command/working window.

Firstly the project window consists of all the folders and file listing in a directory form which makes the searching and organizing task much easier. Then is the error/output window that will be used to display all the errors related to the program that has been written as well as the output related to it. Furthermore a suggestion option that enables users to use some predefined suggestions to solve the errors. Next comes the mode window, it basically gives the opportunity to user to switch between predefined modes i.e. If we are done with the programming part we can easily switch to the flowchart mode and start drawing the flowchart with the help of the drag n drop tools provided. We can even add the some documentation like manuals, theory using the theory mode. Last but the most important window i.e. Command/working window. It acts like a text editor while programming or theory writing and like a paint box during flowchart drawing.

While working in this particular window the user also gets the feature of intelli-sense. This feature gives the user a list of available functions. For example, if user is doing some programming and he types "#include." Then the intelli-sense will show all the 12 header files available with it. Some goes with the variable once u declare certain variables you don't need to write the whole name again and again the system will automatically allow you select the rest of the word. There is also going to be a standard naming convention that distinguishes the syntax with different colours. Such as the variables will have different colour then that of the function name and the header files etc. This system combines all the three aspect of the project i.e. the program/code, documentation and flowchart of the same. It saves the whole project as one. This helps other users who are not aware of the code can understand the project with the help of the documents and/or flowchart related to that project. These features makes the IDE easy to use and more understandable.

When it comes to compilation there is an inbuilt compiler. So to run the code the user can just click on the 'run' button included in the toolbar. IDE also supportsdebugging of a program in an interactive way. The debugging will be done step by step by high-lighting each statement, showing the current state,

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variable values. This will help to find and understand each error and statement included in the code. Also we don't need to download compilers or assemblers separately the system will be deployed as a whole package. With all this features the system will also have a quite well response time so that the user do not get irritated. The response time will be made as low as possible.

4. SYSTEM OVERVIEW

IDE has 3 main facilities to provide to the user flowchart editor, source code editor and a text area for the documentation. Here to develop the IDE java programming language will be used as it provides various features platform independent, robust nature, in built functions etc.

4.1. *Methodology*

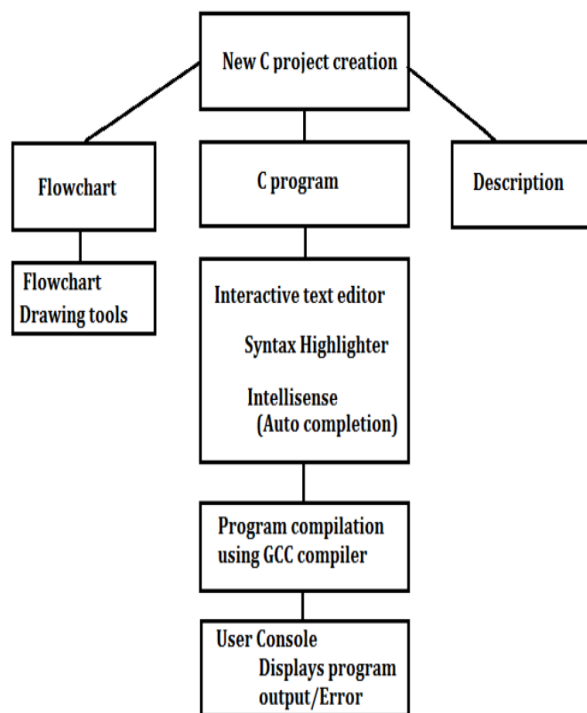The Methodology of IDE is shown below in Fig. 4.1.

Fig 4.1 Methodology for IDE for C language

4.1.1. *New project creation*

New project creation will result in a creation of a folder with the name has given for the new project. A newly created project will contain three sections:

(1) C program files: In this section, all the C file will the stored.

(2)Flowchart: In this section, the flowchart drawn tool will be provided for creation of flowchart which be represent the overall logic of C program.

(3)Description: Details related with the C program can be stored this the section.

4.1.2. *Interactive text editor*

This module, will provide an interactive text editor within which the programmer can type the C program. This module will contain various feature such as Syntax Highlighter, Auto completion feature to ease the programming experience of the programmer.

4.1.3. *Program compilation using GCC compiler*

In this module the, Once the c program is completed, it is passed to the GCC compiler to compile the program and to assess the syntax of the program. Output of compilation, will be an executable program.

4.1.4.*User console*

It serves two purpose:

(1) Displays program output: After successful compilation, the user console is used to display the output of the C program.

(2) Display error message: If the compilation of program fails, the user console display the error which cause the compilation failure.

5. CONCLUSION

Integrated Development Environment for C Language as the name says our IDE is particularly made for C programming language. It provides an interface that not only helps to code in C but also track your directory, displays errors, suggests solutions, helps with auto completion of words and intellisense. It also provides an interface to draw flowcharts and write theory i.e. the documentation work related to the projects. So there is no separate need of other software to do that.

support and kind co-operation to provide us with whatever we require for our project.

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