

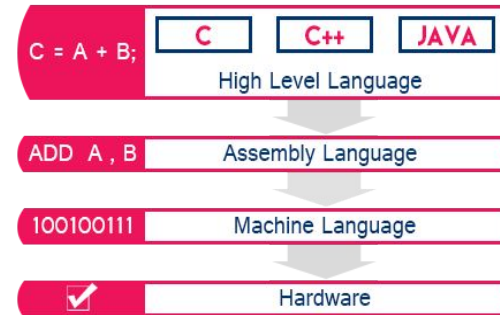
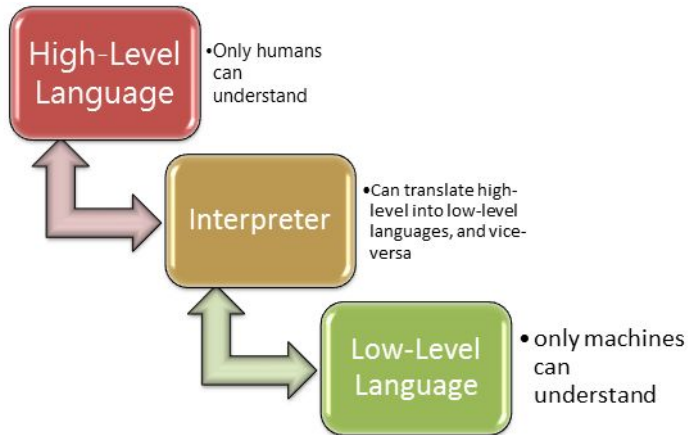
Compiling and Debugging C code

Content

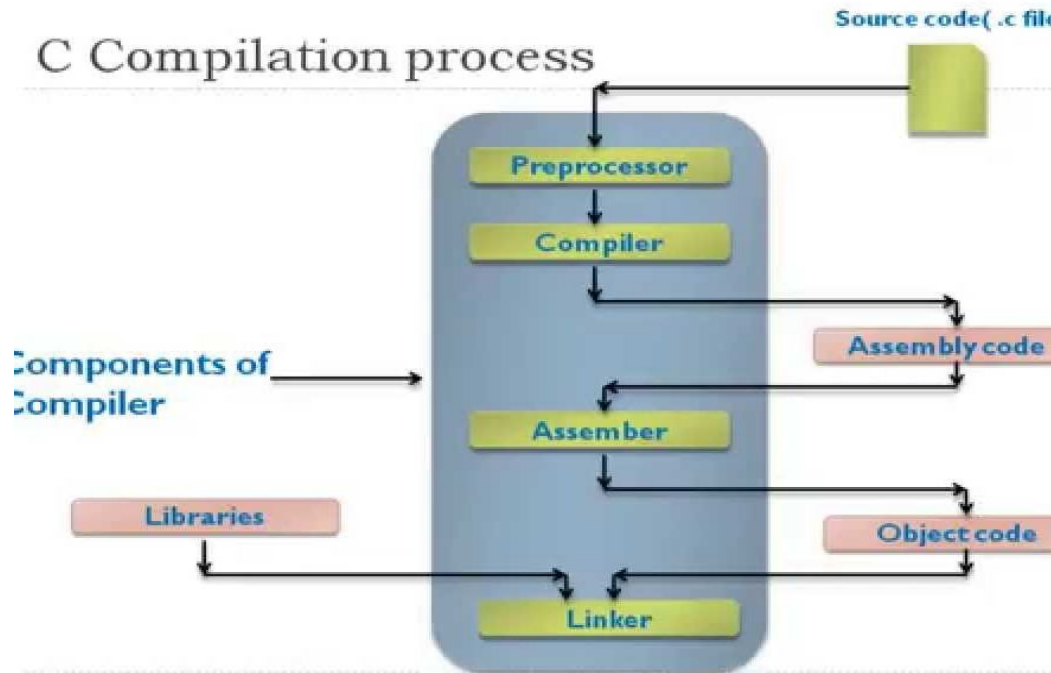
- **Compilation**
 - Stages Involved
 - Compilers and IDE's
 - Difference between Compiler and Debugger
- **Debugging**
 - Introduction to Process
 - Tools for GDB
 - GDB commands
 - Demo

What is Compilation?

- Converts high level language to machine level



Stages of Compilation



- Preprocessing
- Compilation
- Assembly
- Linking

Preprocessing

- Input here is source code(filename.c/filename.cpp file)
- Actions performed
 - Removal of comments
 - Expansion of macros
 - Expansion of included files
- Output is filename.i

Compilation

- Input here is filename.i
- Checks program for syntax error
- Converts code into assembly language
- Output is filename.s

Assembly

- Input is filename.s
- Assembly code converted to machine code
- Output is filename.o
- Function calls are still not converted

Linking

- Input is filename.o
- Function calls are linked to definitions of that functions
- Linker adds some extra code here to denote where programs starts and ends
- Output is executable file

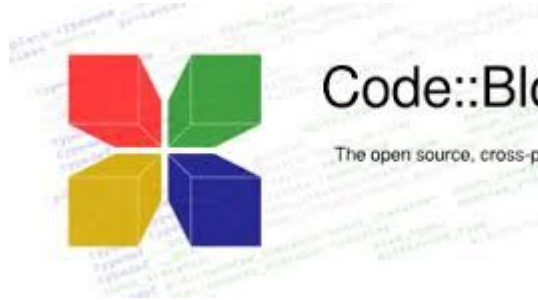
Available compilers



IDEs (Integrated Development Environments)



NetBeans

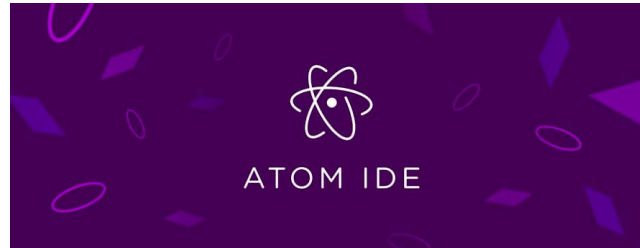


Code::Blocks

The open source, cross-platform IDE



eclipse





Let us start with Debugging...

Error vs Bug vs Defect

- Error: Difference in expected result and actual result.
- Bug : Error at development stage
- Defect : Error after production

Errors

- Compile time errors
- Runtime errors
- Logical errors

What is debugging ?

- It is a multistep process that involves identifying a problem
- Isolating the source of the problem
- Correcting the problem

What is GDB?



GDB

The GNU Project
Debugger

- A program that runs other programs, allowing the user to exercise control over these programs
- GNU Debugger, which is also called **`gdb`**, is the most popular debugger for UNIX systems to debug C and C++ programs.



Enjoy the moment !!!

Demo

Let's do some mind exercise !!!