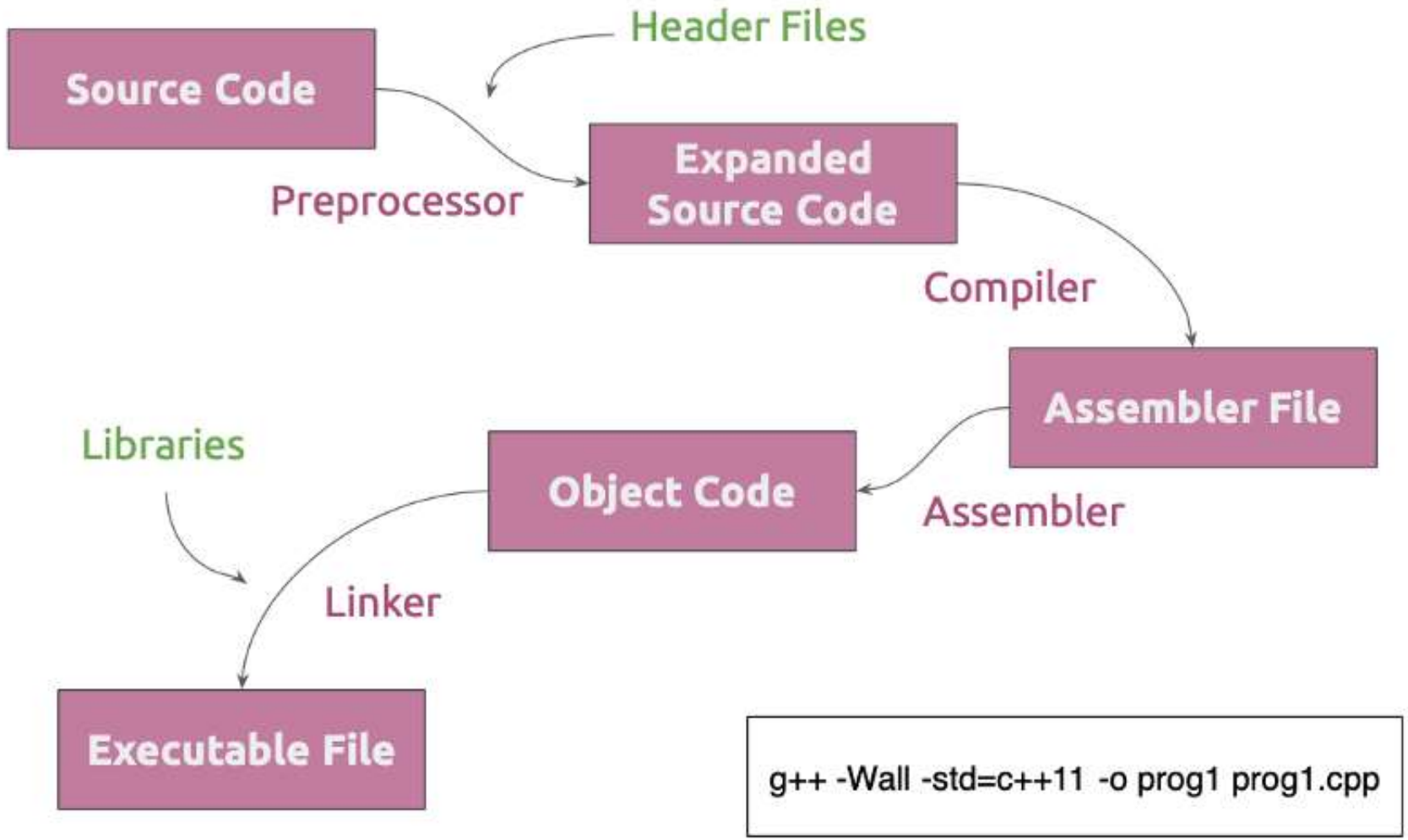
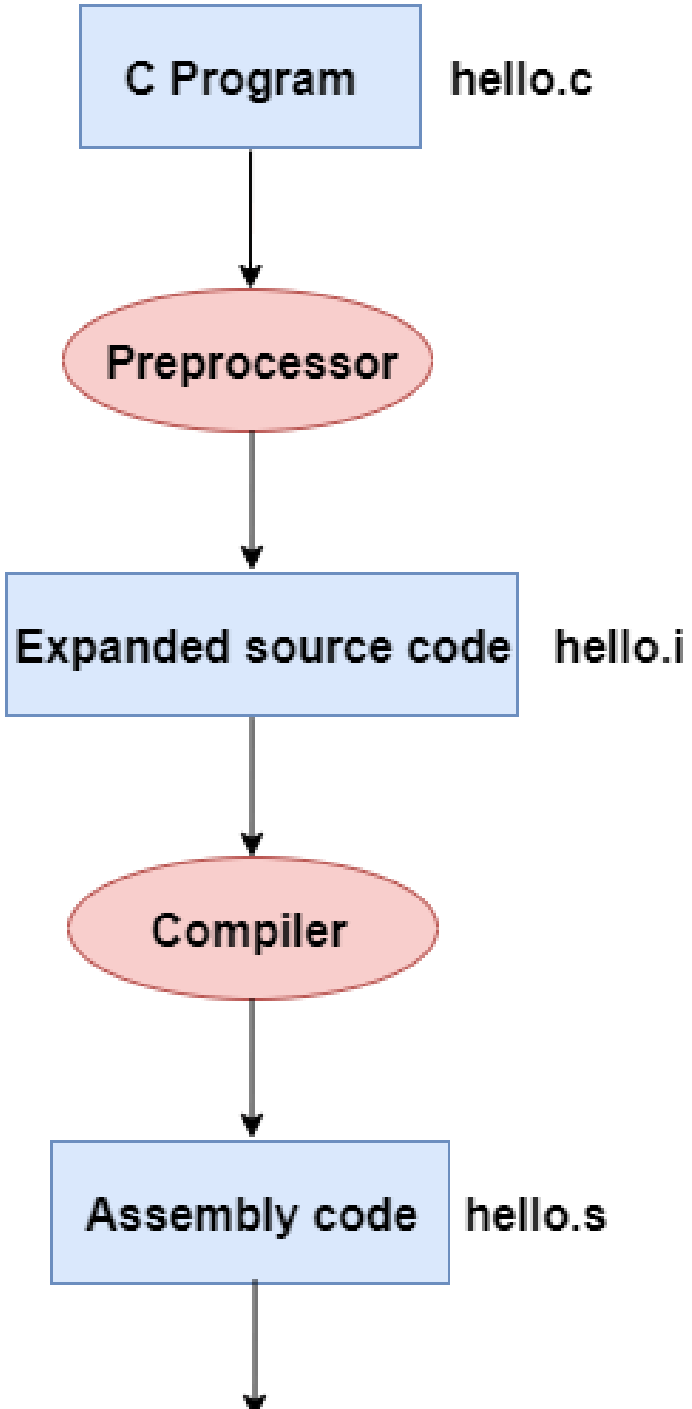
THE BUILD PROCESS


Header Files
Source Code
Preprocessor
Expanded
Source Code
Compiler
Assembler File
Libraries
Object Code
Assembler
Linker
Executable File
g++ -Wall -std=c++11 -o prog1 prog1.cpp


C Program
hello.c
Preprocessor
Expanded source code
hello.i
Compiler
Assembly code
hello.s

PREPROCESSOR

- The source code is the code which is written in a text editor and the source code file is given an extension ".c".
- This source code is first passed to the preprocessor, and then the preprocessor expands this code.
- After expanding the code, the expanded code is passed to the compiler.
- "#includes" and "#defines" statements will be processed and replaced actually source codes in this step.

COMPILER

- The code which is expanded by the preprocessor is passed to the compiler.
- The compiler converts this code into assembly code.
- Or we can say that the C compiler converts the pre-processed code into assembly code.

ASSEMBLER

- The assembly code is converted into object code by using an assembler.
- The name of the object file generated by the assembler is the same as the source file.
- The extension of the object file in DOS is '.obj,' and in UNIX, the extension is 'o’.
- If the name of the source file is **'hello.c',** then the name of the object file would be 'hello.obj'.

LINKER

- All the programs written in C use library functions.
- These library functions are pre-compiled, and the object code of these library files is stored with '.lib' (or '.a') extension.
- The main working of the linker is to combine the object code of library files with the object code of our program.
- Sometimes the situation arises when our program refers to the functions defined in other files; then linker plays a very important role in this. It links the object code of these files to our program.
- Therefore, we conclude that the job of the linker is to link the object code of our program with the object code of the library files and other files.
- The output of the linker is the executable file.

- The name of the executable file is the same as the source file but differs only in their extensions.
- In DOS, the extension of the executable file is '.exe', and in UNIX, the executable file can be named as 'a.out’.
- For example, if we are using printf() function in a program, then the linker adds its associated code in an output file.

LOADER

- Once program is ready it can be run from the command window.
- The loader component of the operating system takes the executable image from disk and transfers it to memory for execution.
- CPU takes each instruction and executes it, possibly storing new data values as the program executes.