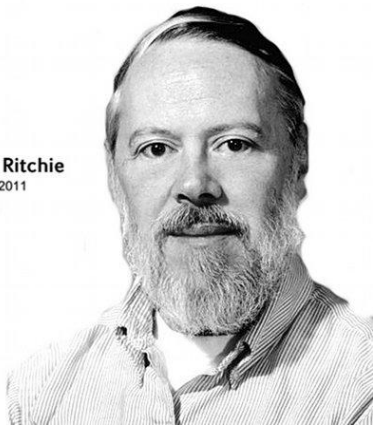


INTRODUCTION TO C

C - A HISTORY

- Derived from B (Basic)
 - Visual Basic is also derived from B
- Released by Dennis Ritchie in 1973
 - Also co-wrote Linux with Ken Thompson

Dennis Ritchie
1941-2011



WHY USE C?

- It's fast:

<http://benchmarksgame.alioth.debian.org/u64q/performance.php?test=nbody>

- Many large-scale programs (and other programming languages) are written in it
 - Linux
 - Python
 - Most compilers
 - Etc...

WHY DIFFERENT PROGRAMMING LANGUAGES?

- Each designed to optimize a certain task
 - Python: Ease of typing
 - Java: Integrated with web interfaces
 - R: Statistical Computing
 - Swift: Integration with Apple products



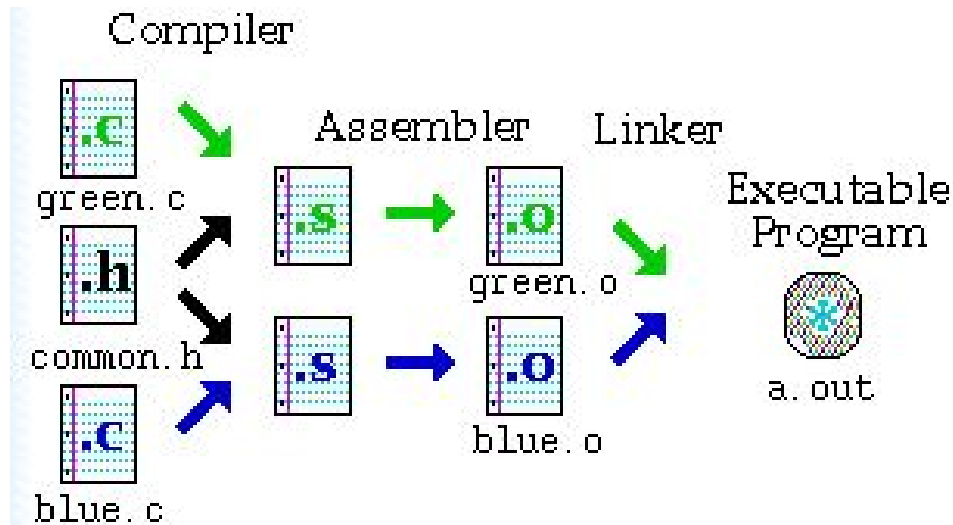
HOW DO THESE PROGRAMS ACTUALLY RUN?

- Type into a *text editor*
 - Nano, Emacs, VI, Eclipse, etc...
 - Similar in function to MS Word/Google Docs



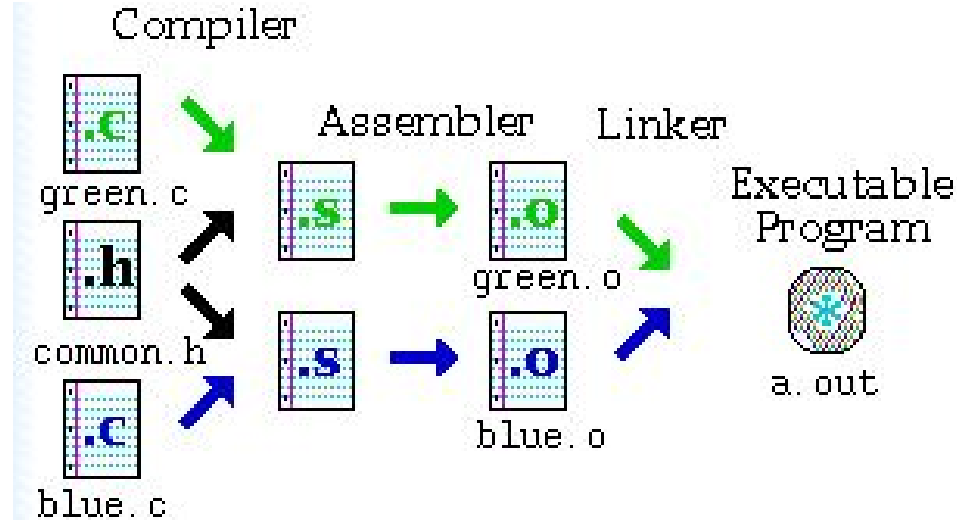
HOW DO THESE PROGRAMS ACTUALLY RUN?

- Code is *compiled*
 - Translates human-written code (*source code*) into binary (*machine code*)



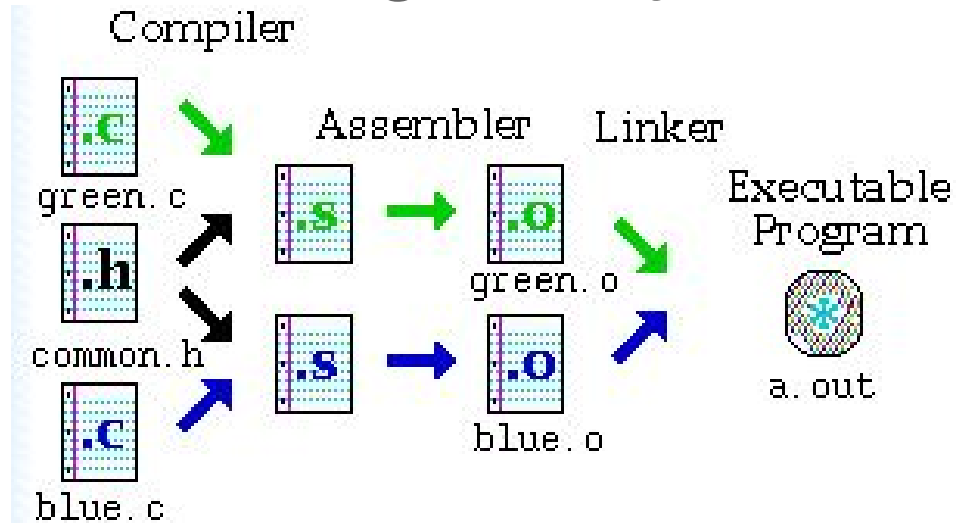
HOW DO THESE PROGRAMS ACTUALLY RUN?

- Compilation: Step 1 = Preprocessing
 - Essentially organizes code into easy-to-process files (uses .c and .h files)



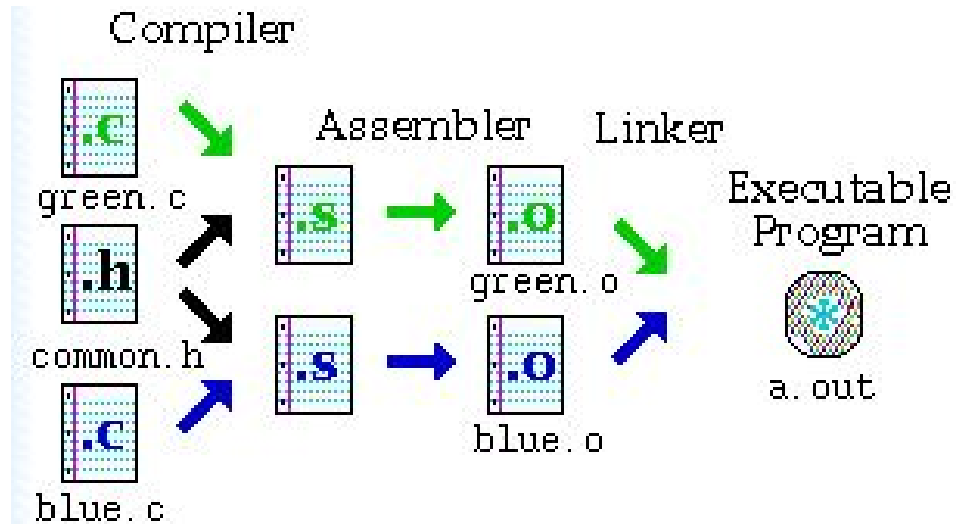
HOW DO THESE PROGRAMS ACTUALLY RUN?

- Compilation: Step 2 = Translation
 - The *Compiler* translates preprocessed code into object code – gives syntax errors



HOW DO THESE PROGRAMS ACTUALLY RUN?

- Compilation: Step 3 = Linking
 - The *Linker* takes the object code and combines all the code into an executable program



FIRST C PROGRAM

```
>> nano hello.c
```

```
/*Use ctrl^o to save*/
```

```
/*Use ctrl^x to exit*/
```

More Nano commands:

<http://staffwww.fullcoll.edu/sedwards/Nano/UsefulNanoKeyCommands.html>

```
#include <stdio.h>

int main(void) {
    printf("Hello, world!\n");
    return 0;
}
```

COMPILATION

- To run preprocessor and compiler:

```
>> gcc -Wall hello.c -c -o hello.o
```

- To run linker:

```
>> gcc hello.o -o hello
```

- To execute program

```
>> ./hello
```

A black rectangular box representing a terminal window. Inside, the text "<hello-world />" is displayed in a monospaced font. The word "hello" is pink, "-world" is green, and the angle brackets and slash are white.

```
<hello-world />
```

COMPILATION - EASY WAY

- To run preprocessor, compiler, and linker:

```
>> gcc -Wall hello.c -o hello
```

- To execute program

```
>> ./hello
```



```
<hello-world />
```