

Compilation Pipeline

CS 2130: Computer Systems and Organization 1

Xinyao Yi Ph.D.
Assistant Professor

Errors

Compile-time errors

- Errors we can catch during compilation (this process)
- **Before** running our program

Runtime errors

- Errors that occur when running our programs (Example: Segmentation fault).

Simple C Example *(we demonstrated an example in portal, check recording)*

```
int main() {  
    return 0;  
}
```

The main function

- Start running the `main()` function
- `main` must return an integer - **exit code**
 - 0 = everything went okay
 - Anything else = something went wrong
- There *should* be arguments to main

why "xorl %eax, %eax" ?

The compiler is choosing to use this as an easy way – a short way – to zero out the return register. It's only two bytes to clear that register with zero.

Data Types in C

Integer data types

Data type	Size (bits)	Size (bytes)
char	8	1
short	16	2
int	32	4
long	64	8
long long	64	8

Each has 2 versions: *signed* and *unsigned*

by default, short, int, long, long long are signed.