

# CSC 1600

## Unix Processes

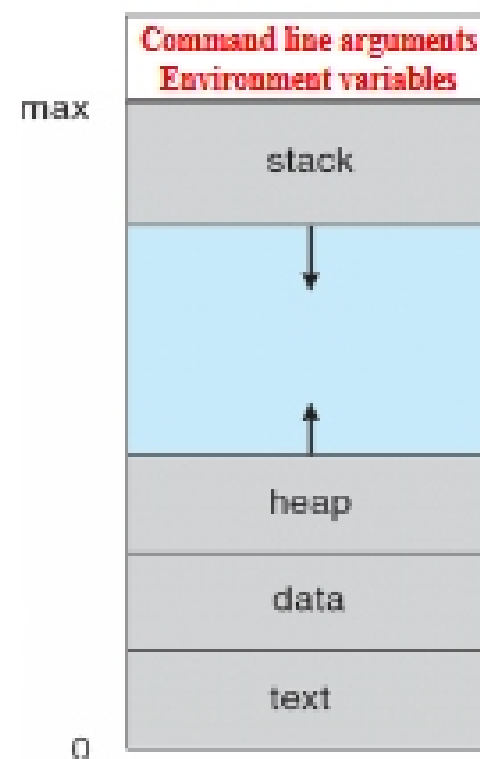
### Goals of This Lecture

- Processes
  - Process vs. program
  - Context switching
- Creating a new process
  - fork: process creates a new child process
  - wait: parent waits for child process to complete
  - exec: child starts running a new program
  - system: combines fork, wait, and exec all in one

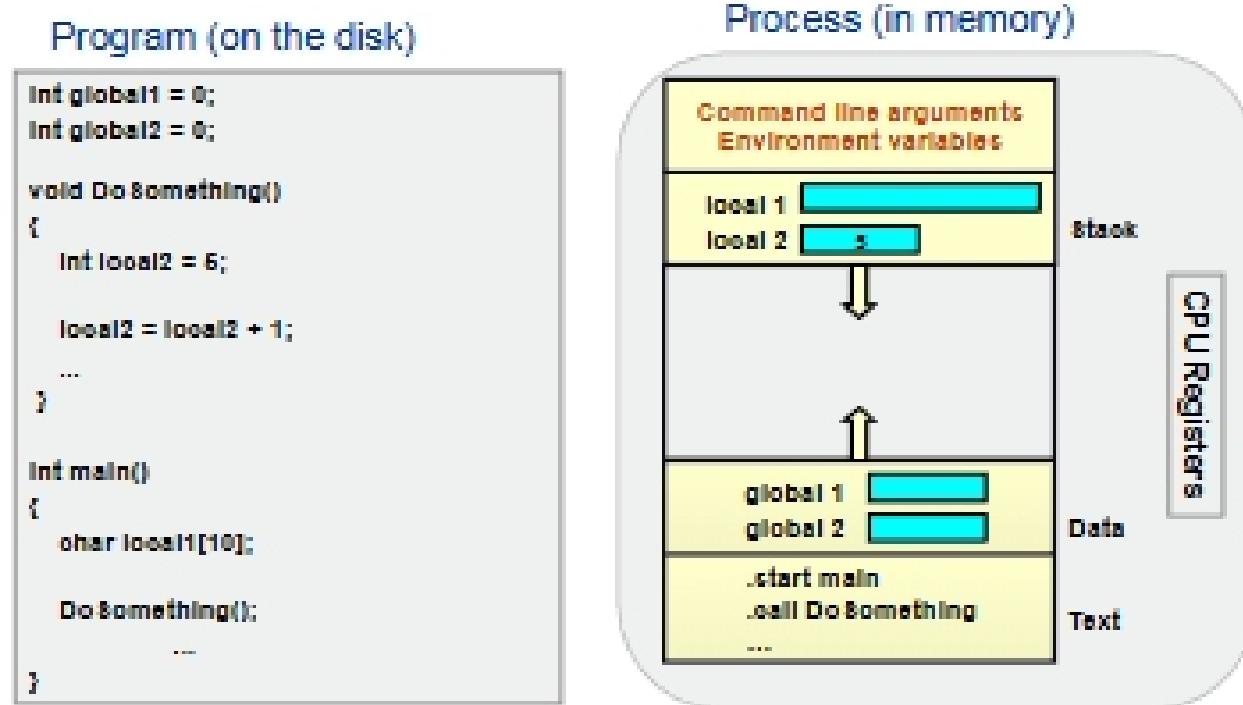
## Program vs. Process

- ❑ **Program** = Static executable file on the disk
- ❑ **Process** = Program in execution, with its own
  - ❑ Address space (illusion of a memory)
    - ❑ Text, Data, BSS, heap, stack
  - ❑ Processor state (illusion of a processor)
    - ❑ Program counter, registers
  - ❑ Open file descriptors (illusion of a disk)
    - ❑ Either running, blocked, or ready...
- ❑ Can run multiple instances of the same program
  - ❑ Each as its own process, with its own process ID

## Process in Memory



## Program vs. Process



## What if More Processes in Memory?

- Each process has its own Text, Data and Stack

