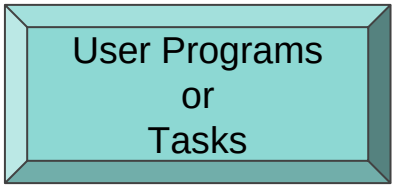
# Process

# Process Concept

What to call the activities of CPU ?


Batch System




Time Sharing System

These activities are called “**Processes**”

★ The terms **“*job*”** and **“*process*”** are used almost interchangeably.

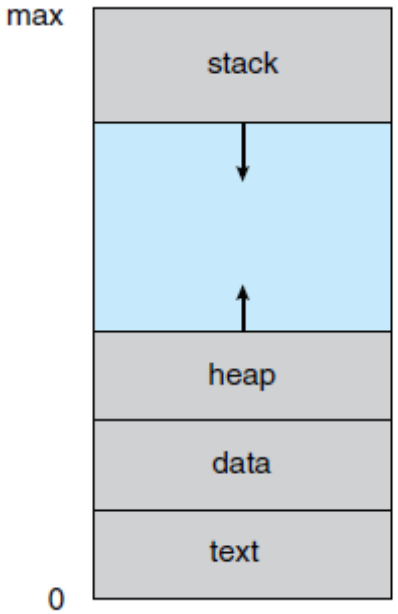
# Process

A process is a program that is in execution.

But, it is more than the program codes. Program code is known as “text section” of a process.

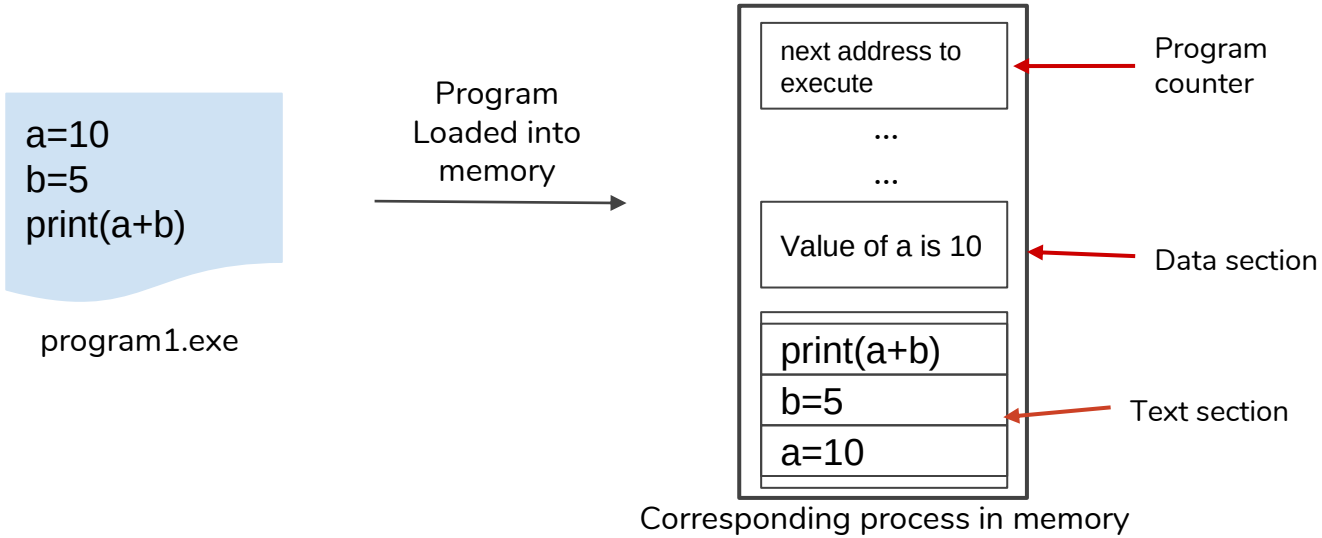
Besides code of the program, it contains -

- **Program Counter and Registers:** stores current activity of the process
- **Stack:** Temporary data (function parameter, local variables, return addresses etc.)
- **Data Section:** Global Variables
- **Heap:** dynamically allocated memory during runtime

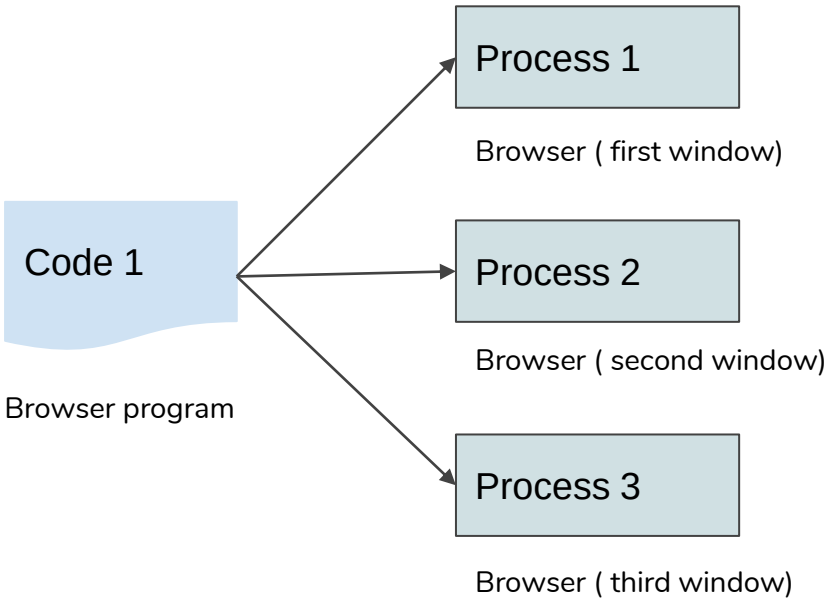


# Program Vs Process

- Program is a collection of instructions that can be executed
- A program is a **passive** entity.
- A process is an **active** entity.
- A program becomes a process when it is loaded into memory for execution.



# Same program, Different Process




- Program code is same
- Data, Heap, Stacks contains different information

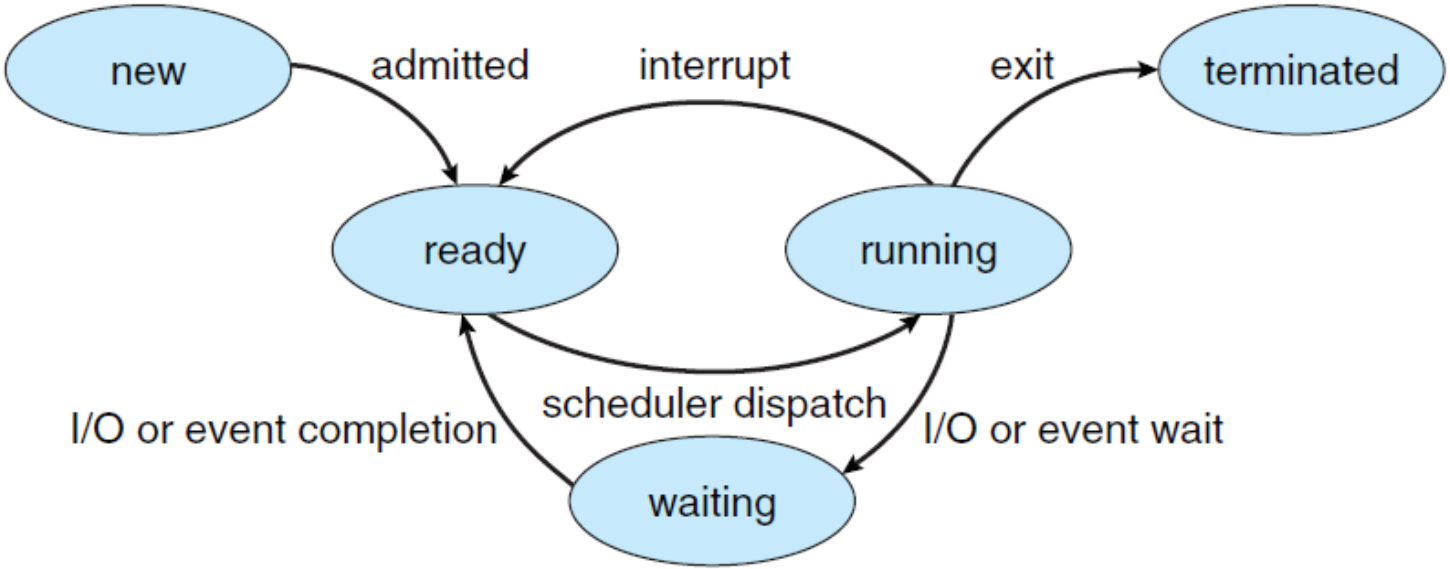
# States of a Process

A process state defines the current activity of that process.

The states a process can be:

- **New**: Process is being created
- **Running**: Instructions are being executed
- **Waiting**: Process is waiting for some event to occur
- **Ready**: Waiting to be assigned to a processor
- **Terminated**: Process has finished execution

# Process State Diagram

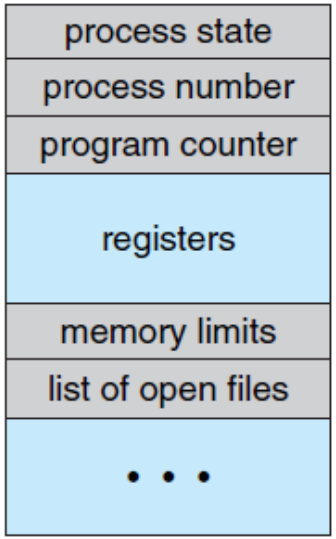


# Representation of Processes in OS

Each process is represented in the operating system by a ***Process Control Block (PCB)***

PCB is a data structure to store information of Processes such as -

- Process state
- Program counter
- CPU registers
- CPU scheduling information
- Memory-management information
- Accounting information
- I/O status information




Process Control Block