

Process



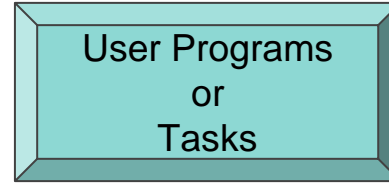


Process Concept

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.



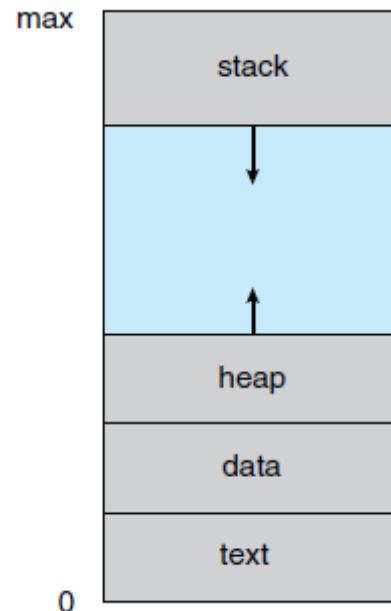
Process

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.

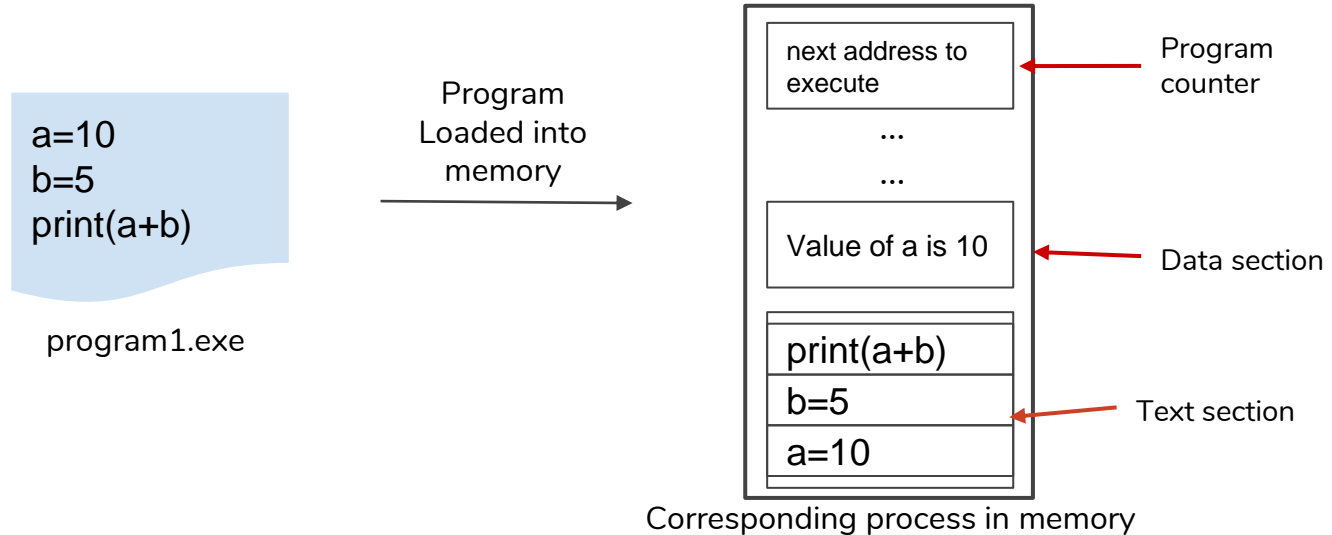
Besides code of the program, it contains -

- **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

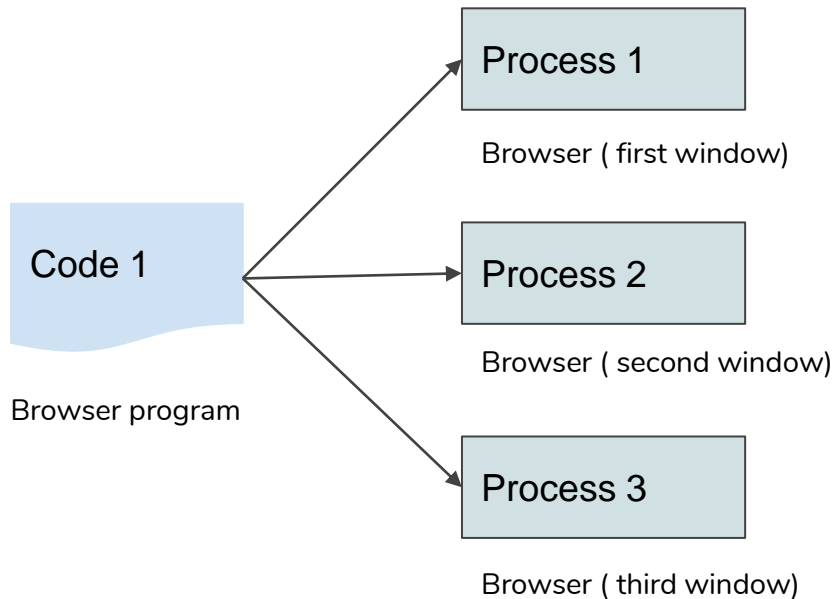


Program Vs Process

- ❑ 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



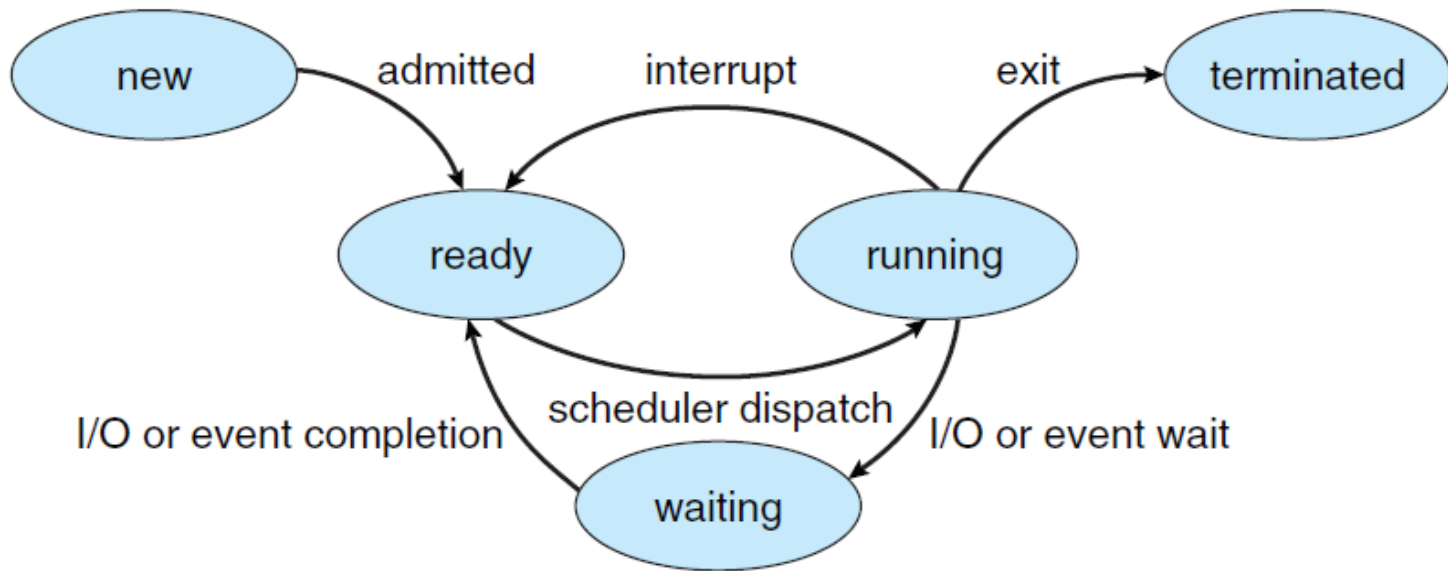
States of a Process

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



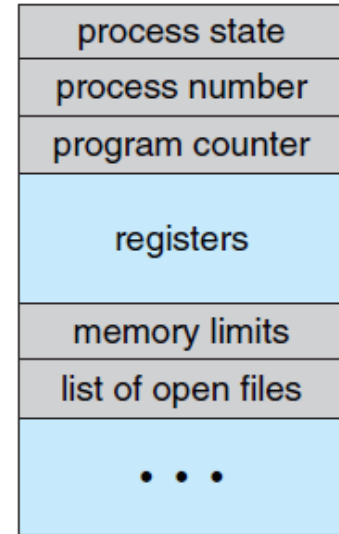


Representation of Processes in OS

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