# PCB

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## Functions

* None

## Data Types

* enum PROCESS\_STATE
  + This is an enumerator defining all the different possible process states.
  + The possible states are
    - NEW
    - READY
    - RUNNING
    - BLOCKED
    - COMPLETE

## Class Attributes

* Int pid: The process id attribute. This is unique to each instance of the class.
* PROCESS\_STATE state: The state attribute holds the current state of the process.
* Int entryTime: This is the cycle that the process is being entered into the system.
* Int ramNeeded: This is the number of MB of RAM that the process needs to run.
  + It can be between 1 and 16.
* Int totalCycles: This is the total number of cycles that the process has been in the system.
* Int currentExecutionCycle: This is the counter for the number of cycles that the process has been executed for.
* Int totalExecutionCycles: This is the total number of cycles that the process must be executed for. This does not include cycles in which the process is waiting for an IO request.
* Int nextIORequest: This is the counter for the next IO request that the process will have to wait for. It is used as an index in ioBeginnings (see below).
* Int currentIORequest: This is the counter for the current IO request that the process is waiting for. It is used as an index in ioRequestLengths.
* Int ioBeginnings[]: This is an array that holds the execution cycle counts that mark the beginning of IO requests. It has a maximum of 5 valid entries. If less than 5 entries are needed, then the ununsed entries are set to 0.
* Int ioRequestLengths[]: This is an array that holds the lengths of IO requests (corresponding to the same index in ioBeginnings). It has a maximum of 5 valid entries. If less than 5 entries are needed, then the ununsed entries are set to 0.
* Int currentIOCycle: This is the counter for the number of cycles that the process has been in its current IO request.

## High-Level Description

The PCB class is models the PCB structure in a real OS. It holds all variables required for process execution and tracking (see “Class Attributes”). An instance of this class is created for each job, and it is the main data structure that is being accessed and modified within the system.