Swiss Re

Task Manager

With Task Manager (TM) we refer to a software component that is designed for handling multiple processes inside an operating system. Each process is identified by 2 fields, a unique unmodifiable identifier (PID), and a priority (low, medium, high).

The process is immutable, it is generated with a priority and will die with this priority – each process has a kill() method that will destroy it. We want the Task Manager to expose the following functionality:

- Add a process
- List running processes
- Kill/KillGroup/KillAll

Please keep in mind that the key requirements of the Job Description position will be evaluated in this coding exercise (including but not limited to code structure, algorithms, complexity analysis, design decisions). The ideal solution contains a README.md file explaining why certain decisions were taken and how to run the solution.

Add a process (1/4)

The task manager should have a prefixed maximum capacity, so it can not have more than a certain number of running processes within itself. This value is defined at build time.
The add(process) method in TM is used for it. The default behaviour is that we can accept new processes till when there is capacity inside the Task Manager, otherwise we won't accept any new process.

Add a process – FIFO approach (2/4)

A different customer wants a different behaviour: she's asking to accept all new processes through the add() method, killing and removing from the TM list the oldest one (First-In, First-Out) when the max size is reached

Add a process – Priority based (3/4)

A new customer is asking something different again, every call to the add() method, when the max size is reached, should result into an evaluation: if the new process passed in the add() call has a higher priority compared to any of the existing one, we remove the lowest priority that is the oldest, otherwise we skip it.

List running processes (4/4)

The task manager offers the possibility to list() all the running processes, sorting them by time of creation (implicitly we can consider it the time in which has been added to the TM), priority or id.