CloudSim assignment

1. Create one data center with 500 hosts. Each host must have:
    a. 8 cores (10000 MIPS each)
    b. 65 GB of RAM
    c. 10 TB of storage

2. Implement a new broker class. This broker must:
    a. Read the workload file. It is a text file, where each line of the file describes a task, containing:

<submission time> <MIs> <min memory to execute (MB)> <min storage to execute (MB)> <deadline (wallclock time)>

    b. Based on it, it needs to perform the following steps:
        i. Create cloudlets representing each task from the workload file.
        ii. **Provisioning**: deciding and creating the number and type of VMs required to execute the tasks before their deadlines and with minimum cost, as well as starting and finishing the VMs. **Machines must be modeled after Amazon EC2 virtual machines (Sydney price). You can assume that 1ECU=1000 MIPS.**
        iii. **Scheduling**: as each task arrives to the broker (i.e., submission time=current simulation time), decide in which VM the task will run and the order in the VM queue the task will be inserted. **IMPORTANT:** the scheduler must guarantee that, at any moment, each VM executes in the maximum one task for each core it has. Thus, a VM with a single core should execute only one task per time, a VM with 2 cores should execute up to 2 tasks in parallel, and so on. Tasks scheduled to a VM that exceeded its capacity should go to a queue managed by the Broker. There should have one of such queues per VM.
        iv. **Dispatching:** Submitting tasks for execution when there are idle cores on VMs, respecting the limit above (1 task per core).

3. After the execution of the whole workload, plot a histogram with execution times of machines. Also collect the cost for execution of the workload and the total time for execution of the whole workload.

4. Implement a different provisioning/policy for the broker above (or a new broker with a different policy). Execute the same workload, plot the histograms and collect the same metrics.

5. Compare the performance of the two algorithms: show graphs comparing execution time and cost and discuss the results.

6. Write a report (3-4 pages) detailing the problem, the simulation scenario, assumptions you made about issues not specified in this assignment, the algorithms implemented, and results' discussion.