**High-Level Functionalities:**

**1.Logs generator:**

* Given 1000 servers and each server has 2 CPUs i.e. two CPU IDs, so a total of 2000 different instances. A log will be generated for each minute which will result in:

1 instance -> 24\*60 = 1440 logs per day

2000 instances -> 2000 \* 24 \* 60 = 2,880,000 logs per day

* The log generator will generate 1000 text files in the DATA\_PATH folder one for each IP address. The range of IP addresses is limited to ‘192.168.1.1’ -‘192.168.4.235’.
* Each text file will consist of logs specific to that IP address for two types of CPUs (i.e. 0 and 1) along with the randomly generated CPU usages.

**2.Query/filter Logs:**

* This will filter the logs of a specific IP address and a specific CPU type for the given range of date times.
* All the generated logs are limited to a single date as per the requirement which is 2014-10-31.
* Firstly, I am pulling up all the relevant logs of a given IP address and CPU type into an array, which would be sorted by default as we have added in an ordered manner at the time of insertion.
* Secondly, I am applying **Binary Search** on the timestamp array and finding out the indexes of the array as per the provided start time and end time.
* As we are using Binary Search the time complexity of the search will be O(log n), so the search will be happening within a second.
* Then Outputting the result as per the required format.