Static Checking and Code Review
Assignment 1

Note: Please follow all the guidelines discussed in the session. e.g. Do not use magic numbers.

Question 1

Design a class HexCalc that supports following methods for hexadecimal arithmetic. You can assume that this class will be working with only positive integers.

1. Methods to add, subtract, multiply and divide two hexadecimal numbers. Each of the methods will receive hexadecimal numbers as strings, and will return the computed value as hexadecimal string. The strategy that can be followed by each of the methods is to convert the strings into numbers, perform the computation, and reconvert the result back into hexadecimal representation.
2. Methods to compare two hexadecimal numbers for ==, > and <. Each of these methods will return a boolean value. Implement these methods without converting the arguments to decimal numbers for comparison.
3. Return the decimal representation of hexadecimal number.
4. Return the hexadecimal representation of decimal number.

How would you generalise this to support arithmetic in any base?

Question 2

Design a class JobScheduler to simulate FCFS (First Come First Serve) scheduling algorithm.
FCFS means the process which arrives first, gets executed first.

Assume that we are receiving a number of processes with their arrival time and burst time seconds in a two dimensional array as input. For example:

[0][10]
[6][20]
[60][10]
[110][5]

Define methods to perform following operations:

1. Calculate completion time for each process.
2. Calculate waiting time for each process.
3. Calculate turn around time for each process.
4. Average waiting time of processes.
5. Maximum waiting time period for a process in queue.

Here we have simple formulae for calculating various times for given processes:

Completion Time: Time taken for the execution to complete, starting from arrival time of first process.
Turn Around Time: Time taken to complete after arrival. In simple words, it is the difference between the Completion time and the Arrival time.
Waiting Time: Total time the process has to wait before it's execution begins. It is the difference between the Turn Around time and the Burst time of the process.
Burst Time : Time required to execute a process.