Fall 2020

COP5615 Distributed Operating System Principles

Readme file

Project 1

Group Details

Parth P. Chitroda	Saheel R. Sawant
5189-1737	1164-7923
pchitroda@ufl.edu	sawant.s@ufl.edu

Q-1 Size of the work unit that you determined results in best performance for your implementation and an explanation on how you determined it. Size of the work unit refers to the number of subproblems that a worker gets in a single request from the boss.

Ans:

- For the given problem, firstly we are taking N and K values from the command line. We are dividing the workload (N) among 30 actors since we observed that it gave a better performance for our program.
- For each actor, the work range is computed by dividing N by the total number of actors and work range changes according to the value of N. After these calculations, the main `BossActor` is recursively spawning the given number of subordinate actors and is passing each of them the K value and a specific start range and end range.
- The `ActorCreator` class inherits the `Actor` interface inside which it iteratively checks for the given work range whether Lucas' Square Pyramid values exist or not and prints those values on the screen.
- Once all the subordinate actors have finished their assigned work, and when the end range of the last actor matches N, the program gets terminated and displays the CPU time and REAL time.

Q-2 The result of running your program for input: `dotnet fsi proj1.fsx 1000000 4`

Ans: For the given N and K values, since there exist no possible Lucas' Square Pyramid values, no output is printed on the screen.

Q-3 The running time for the above as reported by time for the above, i.e run `time scala project1.scala 1000000 4` and report the time. The ratio of CPU time to REAL TIME tells you how many cores were effectively used in the computation. If your are close to 1 you have almost no parallelism (points will be subtracted).

Ans: We ran our programs on Ubuntu OS with 8 cores and for the above problem the CPU time is 00:00:24.190 and the REAL time is 00:00:05.134.The ratio of CPU time to REAL time is 4.71

Q-4 The largest problem you managed to solve.

Ans: The largest problem we managed to solve is N = 100000000 and K = 24 and the ratio of CPU time to REAL time is 3.75