Distributed Operating Systems (COP 5615)

Project 1

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I.   Instructions for Execution

- cd Proj1
- cd dotnet build   \\To build the project
- dotnet fsi proj1.fsx N k   \\To run the project by passing the values of N & k

II.   Size of the work unit VS Performance:

Size of work unit	Actors	Real Time	CPU Time	Ratio
1	8	1.073	1.112	1.03
10	8	0.802	1.062	1.3
100	8	0.664	1.015	1.58
1000	8	0.510	1.001	2
10000	8	0.715	0.950	1.33

From the above results we can see that by taking the number of actors to be equal to the No.of processors and testing the problems, we get the best performance for a work unit of size 1000.

III.   Result of running the Program :

```
Gowthams-MacBook-Pro:Proj1 gowtham$ dotnet fsi temp.fsx 1000000 4
Real: 00:00:00.518, CPU: 00:00:01.072, GC gen0: 89, gen1: 1, gen2: 0
Gowthams-MacBook-Pro:Proj1 gowtham$ 
```

IV.   Running time for the given case:

- Real Time : 518 milliseconds , CPU Time : 1072 milliseconds
- Ratio : 1072/518 = 2.069

V.   Largest problem we managed to solve:
-    The largest problem we could solve is for N = 10^8 & k = 24.
-    Output for the problem:

```
Gowthams-MacBook-Pro:Proj1 gowtham$ dotnet fsi proj1.fsx 100000000 24
1
540
304
9
2053
20
25
44
76
1301
121
856
353
197
3112
3597
5448
8576
12981
20425
30908
35709
54032
84996
128601
202289
306060
353585
534964
841476
1273121
2002557
3029784
3500233
5295700
8329856
12602701
19823373
29991872
34648837
52422128
82457176
Real: 00:00:31.478, CPU: 00:01:35.114, GC gen0: 28713, gen1: 15, gen2: 1
```

NOTE : The machine being used to test the project and generate the screenshots is Macbook Air, with the processor 1.1GHz dual-core Intel Core i3.