

Fall 2021 COP5615  
Project 1 Report  
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1.

Work Unit	Actor	CPU	REAL	CPU utilization
125	80000	214.729	119.117	1.803
1250	8000	131.324	27.799	4.724
12500	800	128.693	23.373	5.506
125000	80	153.601	23.800	6.454
1250000	8	85.987	18.384	4.677

Work Unit in the table above = 10,000,000 / number of Actors. 10,000,000 is the total number of random strings we generated that added to the prefix.

Based on the table above, the larger size of work unit is, the relative higher ratio we get. The ratio increases from 1.803 to 6.454, and then decreases to 4.667.

When the work unit is 125000, the performance for our implementation is the best because the ratio is the highest.

2.

The result of running your program for input 4 is:

```

[(base) DafeideMacBook-Pro:COP-5615 ddf$ dotnet fsi project1.fsx 4
Real: 00:00:00.000, CPU: 00:00:00.000, GC gen0: 0, gen1: 0, gen2: 0
yuhaoshi6:)-e4?Sw^a|~*hV0,-t 000045c963debb3c04dbf5e2c529013c1e547279dfb435fb35d24a
d8e8356705
yuhaoshiuk)/[0*<x2rq8GfIk*Y 00005e674d8002d8222d52261560e762dd0e0531dd0c5db17e2c02
1764b7421b
yuhaoshi+J;k+nZ::{'^V)gwvr'h| 000013969ec278a7d489ad88d9001077e2e61a316792bea3a90dbd
6a3cc2df7f
yuhaoshi/'T^H(y=m-s4Ar[VfG"< 00008736a437affa4e8d4d1ce93b354df252dc05b6258d35f92334
b3718d05fa
yuhaoshiS'9.NXH|8d}2>Iz6]Myq 0000f08a716d1f44cf85adf8ca5989a8afa38e866ab96e265f0f31
0368a049a9
yuhaoshiW6xt:BViQ~%sS@?$?4 aS 0000749ea6b84d4a0a0e3d67541dbccd2f05afc44d220e1cd6d375
b1cf71a123
yuhaoshiw*=7b@<K(d|FZ1.L o|e 00002b0c6c0269d3d2fe228bc41238f0f072f62d6fe36ea9686bf1
d51ca2f97e
yuhaoshiIg2#(b]Dj=_9]fUTzxeX 0000eb69e28444b1feafb34b849dfcfff3146eb0231d19e45b75f71
d131cb2c46
yuhaoshiRNd^siPTCp`vu5)^6E%. 00008a0869c231677ddcf04f25f95f2ff3c8173dfbd41ed0abc5ba
348990cbde
yuhaoshiPF]M_05DULQqt+.mD1N 0000921c2e863f8220e9d2a53c9edbb7a571a035a4c7df081a2fff
bbb2533666
yuhaoshi?8~_4n2u;A2RR$RiAH.A 0000cc0068a010ca03942410c2257fa4494437531004b35670bf6f
812343f2fd
yuhaoshiMk~m=~r8}FfF?=8//,dw 0000798f4f1912b29af4cd219fb3d1bd826f16a89d3225d63a333a
2f46c3f136
yuhaoshie(Aqx1NajGLkb+64B)L7 0000f6e1a9f579d855c2f22cb8f13ac14ff360aba281d19be3f933
9fbf8e6eca
Real: 00:00:02.225, CPU: 00:00:10.441, GC gen0: 1255, gen1: 1, gen2: 0
(base) DafeideMacBook-Pro:COP-5615 ddf$ █

```

3.

```

(base) DafeideMacBook-Pro:COP-5615 ddf$ dotnet fsi project1.fsx 4
Real: 00:00:00.000, CPU: 00:00:00.000, GC gen0: 0, gen1: 0, gen2: 0
yuhaoshi6:)-e4?Sw^a|~*hV0,-t 000045c963debb3c04dbf5e2c529013c1e547279dfb435fb35d24a
d8e8356705
yuhaoshiuk)/[O*x2rq8GfIk*Y 00005e674d8002d8222d52261560e762dd0e0531dd0c5db17e2c02
1764b7421b
yuhaoshi+J;k+nZ::{^V)gwvr'h| 000013969ec278a7d489ad88d9001077e2e61a316792bea3a90dbd
6a3cc2df7f
yuhaoshi/'T^H(y=m-s4Ar[VfG"< 00008736a437affa4e8d4d1ce93b354df252dc05b6258d35f92334
b3718d05fa
yuhaoshiS'9.NXH|8d}2>Iz6]Myq 0000f08a716d1f44cf85adf8ca5989a8afa38e866ab96e265f0f31
0368a049a9
yuhaoshiW6xt:BViq~%sS@?$?4 aS 0000749ea6b84d4a0a0e3d67541dbccd2f05afc44d220e1cd6d375
b1cf71a123
yuhaoshiw*=7b@<K(d|FZ1.L o|e 00002b0c6c0269d3d2fe228bc41238f0f072f62d6fe36ea9686bf1
d51ca2f97e
yuhaoshiIg2#(b)Dj=_9]fUTzxeX 0000eb69e28444b1feafb34b849dfcff3146eb0231d19e45b75f71
d131cb2c46
yuhaoshiRNd^siPTCp`vu5)^6E%. 00008a0869c231677ddcf04f25f95f2ff3c8173dfbd41ed0abc5ba
348990cbde
yuhaoshiPF]M_05DULQqt+.mD1N 0000921c2e863f8220e9d2a53c9edbb7a571a035a4c7df081a2fff
bbb2533666
yuhaoshi?8~_4n2u;A2RR$RiAH.A 0000cc0068a010ca03942410c2257fa4494437531004b35670bf6f
812343f2fd
yuhaoshiMk~m=~r8}Fff?=8//,dw 0000798f4f1912b29af4cd219fb3d1bd826f16a89d3225d63a333a
2f46c3f136
yuhaoshie(Aqx1NajGLkb+64B)L7 0000f6e1a9f579d855c2f22cb8f13ac14ff360aba281d19be3f933
9fbf8e6eca
Real: 00:00:02.225, CPU: 00:00:10.441, GC gen0: 1255, gen1: 1, gen2: 0
(base) DafeideMacBook-Pro:COP-5615 ddf$

```

Ratio = CPU / Real = 10.441 / 2.225 = 4.693

4.

The coin with the most 0s we managed to find is 6.

```

(base) DafeideMacBook-Pro:COP-5615 ddf$ dotnet fsi project1.fsx 6
Real: 00:00:00.000, CPU: 00:00:00.000, GC gen0: 0, gen1: 0, gen2: 0
yuhaoshizY5>i["T5o@ExeJI$1%C 000000c060c91ab66ce82604fe55a3f2f2d4a4c627bdef54de038b83fe8d49f4
Real: 00:00:18.403, CPU: 00:01:29.359, GC gen0: 12535, gen1: 3, gen2: 0
(base) DafeideMacBook-Pro:COP-5615 ddf$

```

5.

The largest number of working machines we were able to run our code with is 1. But we can run two terminals in a laptop.