README.md

COP5615 Fall 2020 Project 1

- Name: Yu-Peng Chen
- UFID: 70943193

Environment Setup

- Operating System: Ubuntu 18.04.5 LTS
- Processor: Intel® Core™ i5-9300H CPU @ 2.40GHz × 8
- **Steps**
  - Install the .NET Core SDK
  - Install the Ionide-fsharp extension for VSCode
  - *Also did the following steps (but these do not seem to be necessary for this project)* 🤔
    - run `dotnet new console --language F#`
    - run `dotnet add package Akka.FSharp --version 1.4.10`

Command Line

- `dotnet fsi --langversion:preview proj1.fsx N k`
- Report time:
  - `time dotnet fsi --langversion:preview proj1.fsx N k`

Report

- Size of the work unit
  - **Number of workers: 8**
  - Size of work unit is decided by **dividing N by 8 (Number of workers)**, and the remainder goes to the last worker
    - For example, when N = 100, 100/8 = 12,
      - worker 1 gets the tasks starting with *1 to 12*
      - worker 2 gets the tasks starting with *13 to 24*
      - ...
      - worker 7 gets the tasks starting with *73 to 84*
      - worker 8 gets the tasks starting with *85 to 96* plus the tasks starting with *97 to 100*
  - Explanation: the implementation was determined by trial and error.
- The result of running this program for `dotnet fsi --langversion:preview proj1.fsx 1000000 4`
  - **Found nothing** for N = 1000000, k = 4

```
yupeng@yupeng-Nitro-AN515-54:~/FALL2020/COP5615/Proj1$ time dotnet fsi --langv
ersion:preview proj1.fsx 1000000 4
Real: 00:00:00.000, CPU: 00:00:00.000, GC gen0: 0, gen1: 0, gen2: 0

real    0m5.229s
user    0m6.251s
sys     0m0.521s
```

- The running time of running this program for `dotnet fsi --langversion:preview proj1.fsx 1000000 4`
Type	Time
real	0m5.229s
user	0m6.251s
sys	0m0.521s
  - See above image
  - **CPU time** to **real time** ratio = 1.2
- The largest problem I managed to solve
  - `dotnet fsi --langversion:preview proj1.fsx 100000000 2`
  - ```
    yupeng@yupeng-Nitro-AN515-54:~/FALL2020/COP5615/Proj1$ time dotnet fsi --langv
    ersion:preview proj1.fsx 100000000 2
    Real: 00:00:00.000, CPU: 00:00:00.000, GC gen0: 0, gen1: 0, gen2: 0
    3
    20
    119
    696
    4059
    23660
    137903
    803760
    27304196
    4684659

    real    1m17.777s
    user    2m50.814s
    sys     0m20.403s
    ```
  - **CPU time** to **real time** ratio = 2.2

Bonus

- 😨🤯😷
    ```