This is team-work assignment, team members include:

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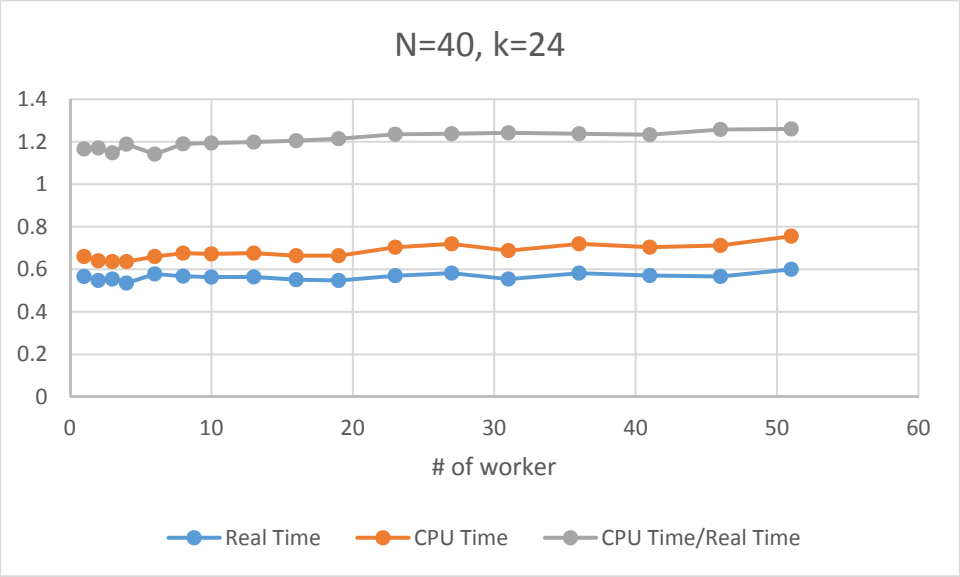
How to compile and run:

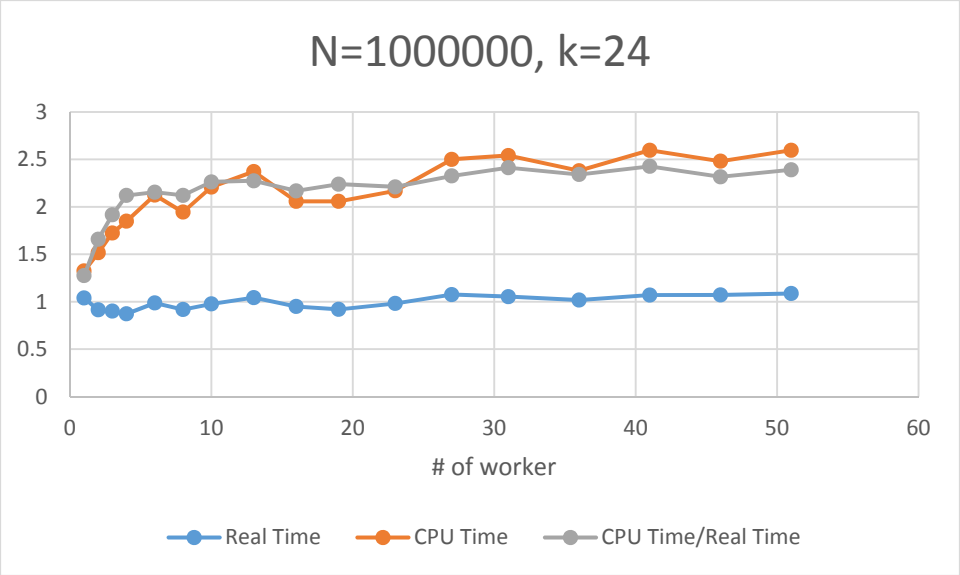
(1) Under the terminal, type **scalac Main.scala**
(2) To run it, use the command **: time scala SqrCal 40 24**
40 means N, 24 means k;

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 sub-problems that a worker gets in a single request from the boss.

Suppose nw = # of workers, each worker receive N/nw sub-problems



Based on the data above, number of 19 workers get the best performance (minimum real time).



Based on the data above, number of 4 workers get the best performance (minimum real time).

Explanation: When worker number is 1, it is just single thread; when increase the number of worker, it goes to muti-thread, muti-thread workers can work at the same time so that the real time decreases rapidly at first. But because of the ability of CPU, during executing muti-thread, the arranging works to each worker also occupy computer resource. So when increasing the number of worker, the real time won't decrease rapidly.

The result of running your program for scala project1.scala 1000000 4

Result:

seria@seria-HP-Pavilion-dv4-Notebook-PC:~/scala/Project1$ time scala sqrcal 1000000 4
Square Numbers:
Duration: 241 milliseconds

real 0m0.759s
user 0m1.332s
sys 0m0.112s

(there is no result for this case)

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).

Real time: 0.76

CPU time: 2.024

CPU time/Real time = 2.663158

The largest problem you managed to solve.

N = 1500000000, k = 4, number of worker = 4

seria@seria-HP-Pavilion-dv4-Notebook-PC:~/scala/Project1$ time scala sqrcal 1500000000 4
Square Numbers:
Duration: 90442 milliseconds

real 1m30.984s
user 5m12.704s
sys 0m8.369s