CSCE 735

Parallel Computing

729007151

Priyanka Karuppuch Samy

time = [0.2456,0.1233,0.0621,0.0318,0.0259,0.0191,0.0521]

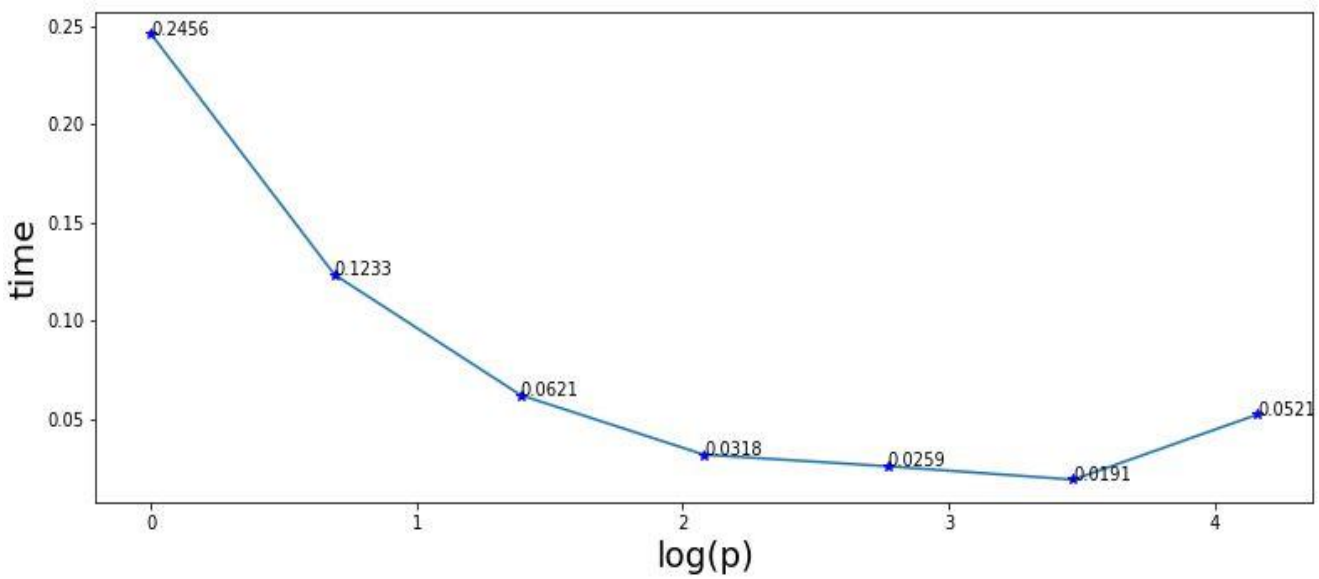
p = [1,2,4,8,16,32,64]

log(p) = [0.0, 0.69, 1.39, 2.08, 2.77, 3.47, 4.16]

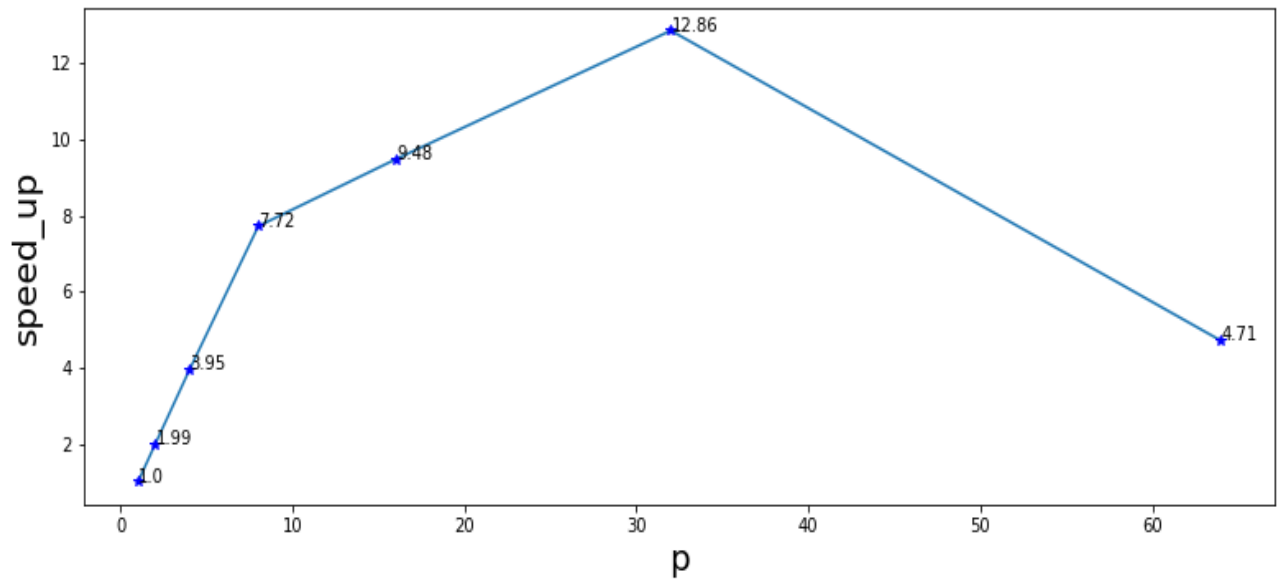
speed_up = [1.0, 1.99, 3.95, 7.72, 9.48, 12.86, 4.71]

efficiency = [1.0, 0.99, 0.99, 0.96, 0.59, 0.4, 0.07]

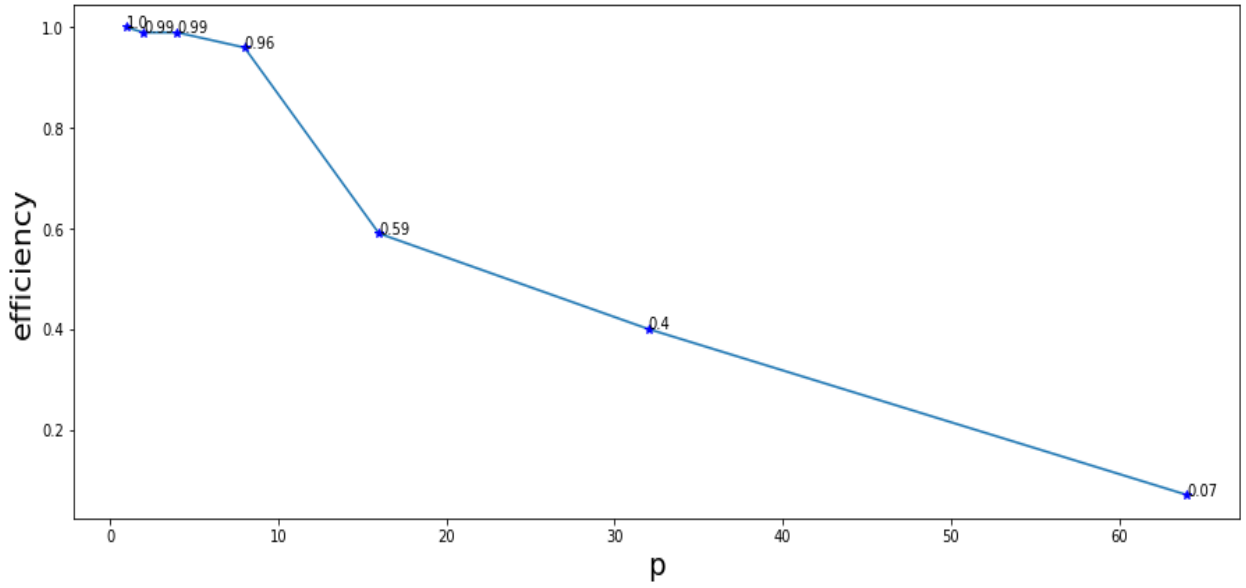
Q1. Execution time vs log(p)



Q2. Speed up vs p



Q3. Efficiency vs p

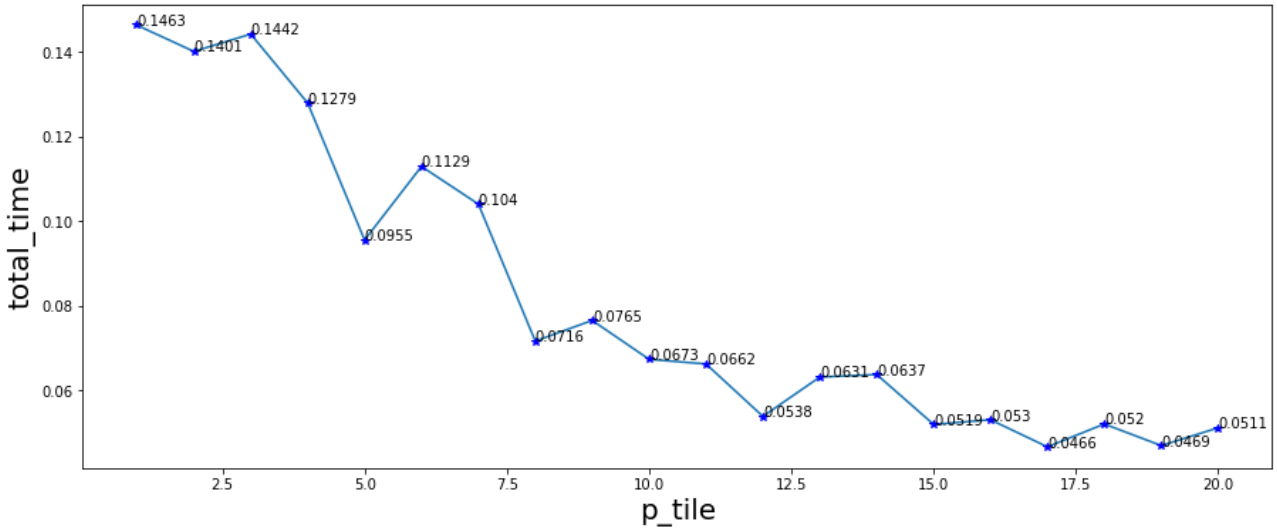


Q4. Parallel runtime (Tp) is least when p = 32 from the graph in Q1.

Q5. Value of ptile that minimizes the total time is 17.

p_tile = [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20]

total_time [0.1463, 0.1401, 0.1442, 0.1279, 0.0955, 0.1129, 0.1040, 0.0716, 0.0765, 0.0673, 0.0662, 0.0538, 0.0631, 0.0637, 0.0519, 0.0530, 0.0466, 0.0520, 0.0469, 0.0511]



6.

n = [100,10000,1000000,100000000]

time_64 = [0.0628,0.0534,0.0592,0.0590]

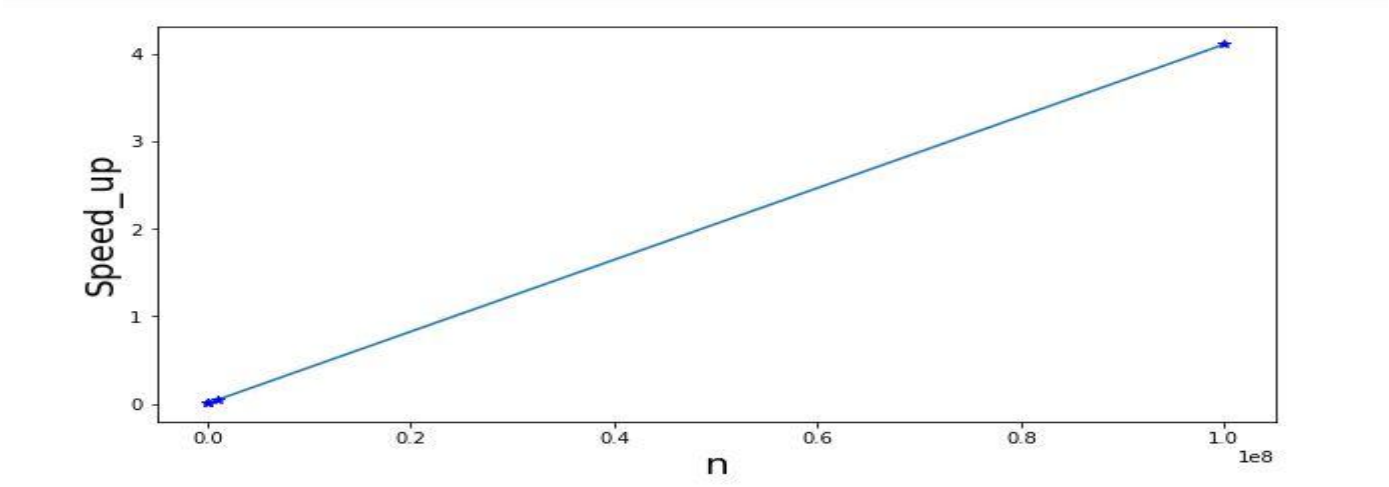
time_1 = [0.0001, 0.0002, 0.0026, 0.2427]

error_64 = [2.65E-06, 2.65E-10, 2.63E-14, 7.07E-16]

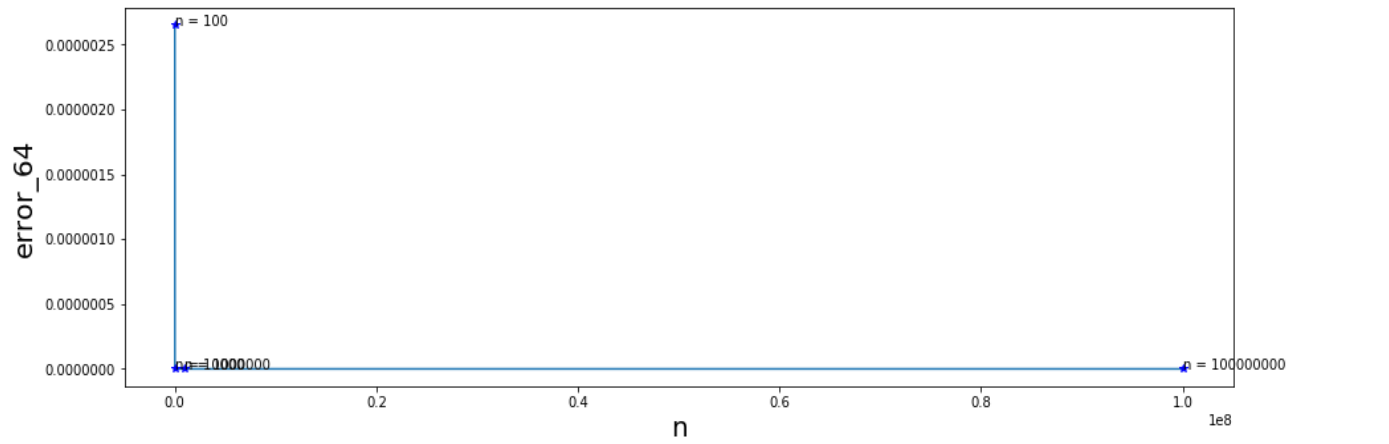
error_1 = [2.65E-06, 2.65E-10, 3.51E-14, 1.35E-13]

speed_up = [0.0016, 0.0037, 0.0439, 4.1136]

6a. Speed up vs n



6b. Relative error vs n with p = 64.



Relative error vs n with p = 1.