CON100 Assignment 5

Report – By Harshit Mawandia

Bad Implementation:

Changing the size of array with constant range(100000)

Size of Array	Output Gmon
100	% cumulative self self total time seconds seconds calls Ts/call Ts/call name 0.00 0.00 0.00 100 0.00 0.00 is_prime 0.00 0.00 0.00 1 0.00 0.00 largest_prime 0.00 0.00 0.00 1 0.00 0.00 random_array
1000	% cumulative self self total time seconds seconds calls Ts/call Ts/call name 0.00 0.00 0.00 1000 0.00 0.00 is_prime 0.00 0.00 0.00 1 0.00 0.00 largest_prime 0.00 0.00 0.00 1 0.00 0.00 random_array
10000	% cumulative self self total time seconds seconds calls ms/call ms/call name 100.00 0.02 0.02 10000 0.00 0.00 is_prime 0.00 0.02 0.00 1 0.00 20.00 largest_prime 0.00 0.02 0.00 1 0.00 0.00 random_array
100000	% cumulative self self total time seconds seconds calls ms/call ms/call name 100.00 0.19 0.19 100000 0.00 0.00 is_prime 0.00 0.19 0.00 1 0.00 190.00 largest_prime 0.00 0.19 0.00 1 0.00 0.00 random_array
1000000	% cumulative self self total time seconds seconds calls s/call s/call name 99.49 1.97 1.97 1000000 0.00 0.00 is_prime 0.51 1.98 0.01 rand 0.00 1.98 0.00 1 0.00 1.97 largest_prime 0.00 1.98 0.00 1 0.00 0.00 random_array

Time taken changes because it takes more time to iterate through more elements in largest_prime function

Bad Implementation:

Changing the range with constant size of array(1000000)

Range of Array	Output Gmon
10	% cumulative self self total time seconds seconds calls Ts/call Ts/call name 100.00 0.01 0.01 __fentry__ 0.00 0.01 0.00 1000000 0.00 0.00 is_prime 0.00 0.01 0.00 1 0.00 0.00 largest_prime 0.00 0.01 0.00 1 0.00 0.00 random_array
100	% cumulative self self total time seconds seconds calls ms/call ms/call name 100.00 0.03 0.03 1000000 0.00 0.00 is_prime 0.00 0.03 0.00 1 0.00 30.00 largest_prime 0.00 0.03 0.00 1 0.00 0.00 random_array
1000	% cumulative self self total time seconds seconds calls ms/call ms/call name 90.91 0.10 0.10 1000000 0.00 0.00 is_prime 9.09 0.11 0.01 1 10.00 10.00 random_array 0.00 0.11 0.00 1 0.00 100.00 largest_prime
10000	% cumulative self self total time seconds seconds calls ms/call ms/call name 100.00 0.66 0.66 1000000 0.00 0.00 is_prime 0.00 0.66 0.00 1 0.00 660.00 largest_prime 0.00 0.66 0.00 1 0.00 0.00 random_array
100000	% cumulative self self total time seconds seconds calls s/call s/call name 99.00 1.98 1.98 1000000 0.00 0.00 is_prime 0.50 1.99 0.01 1 0.01 0.01 random_array 0.50 2.00 0.01 __fentry__ 0.00 2.00 0.00 1 0.00 1.98 largest_prime

Time taken changes because it takes more time to check for prime if the numbers are larger

Efficient Implementation

Changing the size of array with constant range(100000)

Size of Array	Output Gmon
100	% cumulative self self total time seconds seconds calls Ts/call Ts/call name 0.00 0.00 0.00 100 0.00 0.00 is_prime 0.00 0.00 0.00 1 0.00 0.00 largest_prime 0.00 0.00 0.00 1 0.00 0.00 random_array
1000	% cumulative self self total time seconds seconds calls Ts/call Ts/call name 0.00 0.00 0.00 1000 0.00 0.00 is_prime 0.00 0.00 0.00 1 0.00 0.00 largest_prime 0.00 0.00 0.00 1 0.00 0.00 random_array
10000	% cumulative self self total time seconds seconds calls Ts/call Ts/call name 0.00 0.00 0.00 10000 0.00 0.00 is_prime 0.00 0.00 0.00 1 0.00 0.00 largest_prime 0.00 0.00 0.00 1 0.00 0.00 random_array
100000	% cumulative self self total time seconds seconds calls ms/call ms/call name 100.00 0.01 0.01 100000 0.00 0.00 is_prime 0.00 0.01 0.00 1 0.00 10.00 largest_prime 0.00 0.01 0.00 1 0.00 0.00 random_array
1000000	% cumulative self self total time seconds seconds calls ms/call ms/call name 72.73 0.08 0.08 sqrt 27.27 0.11 0.03 1000000 0.00 0.00 is_prime 0.00 0.11 0.00 1 0.00 30.00 largest_prime 0.00 0.11 0.00 1 0.00 0.00 random_array

Efficient Implementation

Changing the range with constant size of array(1000000)

Range of Array	Output Gmon
10	% cumulative self self total time seconds seconds calls ms/call ms/call name 50.00 0.01 0.01 1 10.00 10.00 random_array 50.00 0.02 0.01 sqrt 0.00 0.02 0.00 1000000 0.00 0.00 is_prime 0.00 0.02 0.00 1 0.00 0.00 largest_prime
100	% cumulative self self total time seconds seconds calls Ts/call Ts/call name 66.67 0.02 0.02 sqrt 33.33 0.03 0.01 __fentry__ 0.00 0.03 0.00 1000000 0.00 0.00 is_prime 0.00 0.03 0.00 1 0.00 0.00 largest_prime 0.00 0.03 0.00 1 0.00 0.00 random_array
1000	% cumulative self self total time seconds seconds calls ms/call ms/call name 20.00 0.01 0.01 1000000 0.00 0.00 is_prime 20.00 0.02 0.01 1 10.00 20.00 largest_prime 20.00 0.03 0.01 1 10.00 10.00 random_array 20.00 0.04 0.01 __fentry__ 20.00 0.05 0.01 sqrt
10000	% cumulative self self total time seconds seconds calls ms/call ms/call name 71.43 0.05 0.05 sqrt 28.57 0.07 0.02 1000000 0.00 0.00 is_prime 0.00 0.07 0.00 1 0.00 20.00 largest_prime 0.00 0.07 0.00 1 0.00 0.00 random_array
100000	% cumulative self self total time seconds seconds calls ms/call ms/call name 54.55 0.06 0.06 sqrt 27.27 0.09 0.03 1000000 0.00 0.00 is_prime 9.09 0.10 0.01 1 10.00 10.00 random_array 9.09 0.11 0.01 _mcount_private 0.00 0.11 0.00 1 0.00 30.00 largest_prime

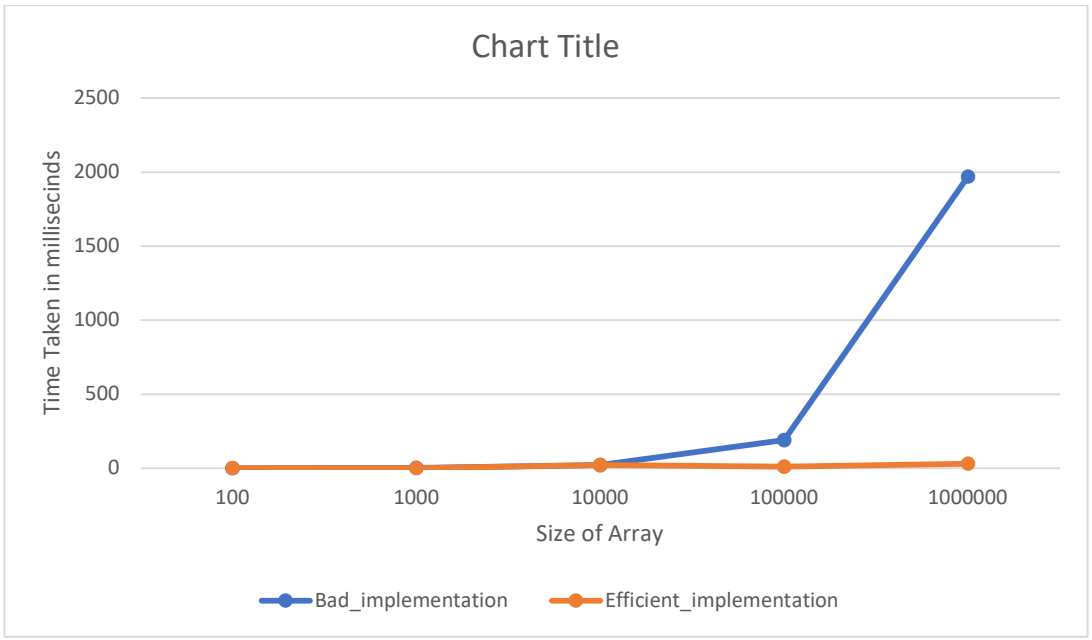
Chart Title
2500
2000
1500
1000
500
0
Time Taken in millisecinds
100
1000
10000
100000
1000000
Size of Array
Bad_implementation
Efficient_implementation