

Lab 4: Using genetic algo for TSP, and comparing execution times for parallel and serial implementation.

GA_ser.cpp is the serial implementation and GA_ser.cpp is its parallel implementation where I have parallelized, using OPENMP, the for loop, responsible for creating mutated version of each route in population, inside the while loop, restricting the threshold number of generations, inside the TSP function meant to solve the TSP.

Sample Outputs and Comparisons of execution time:

```
C:\Users\piyus\Desktop\pc lab\GA_ser.exe
Route Weight of Route
023410 30
014320 30
012340 24
021340 34
021340 34
012340 24
041320 31
034120 41
032410 28
013420 30

Current temp: 6561
Generation 5
Route Weight of Route
042310 21
014320 30
034210 31
024310 30
041320 31
031420 38
021340 34
021430 41
012340 24
031420 38
Time taken by serial program is : 0.062481 sec

-----
Process exited after 3.98 seconds with return value 0
Press any key to continue . . .

C:\Users\piyus\Desktop\pc lab\GA_par.exe
021340 34
Current temp: 7290
Generation 4
Route Weight of Route
023410 30
014320 30
012340 24
021340 34
021340 34
012340 24
041320 31
034120 41
032410 28
013420 30

Current temp: 6561
Generation 5
Route Weight of Route
042310 21
014320 30
034210 31
024310 30
041320 31
031420 38
021340 34
021430 41
012340 24
031420 38
Time taken by parallel program is : 0.031242 sec

-----
Process exited after 0.07188 seconds with return value 0
Press any key to continue . . .
```

Time Taken by Serial program = 0.062481

Time Taken by Parallel Program = 0.031242

Speedup obtained = $0.062481 / 0.031242 = 1.9999$

```
C:\Users\piyus\Desktop\pc lab\GA_ser.exe
Generation 4
Route Weight of Route
023410 30
014320 30
012340 24
021340 34
021340 34
012340 24
041320 31
034120 41
032410 28
013420 30

Current temp: 6561
Generation 5
Route Weight of Route
042310 21
014320 30
034210 31
024310 30
041320 31
031420 38
021340 34
021430 41
012340 24
031420 38
Time taken by serial program is : 0.046864 sec

-----
Process exited after 0.08012 seconds with return value 0
Press any key to continue . . .

C:\Users\piyus\Desktop\pc lab\GA_par.exe
Current temp: 7290
Generation 4
Route Weight of Route
023410 30
014320 30
012340 24
021340 34
021340 34
012340 24
041320 31
034120 41
032410 28
013420 30

Current temp: 6561
Generation 5
Route Weight of Route
042310 21
014320 30
034210 31
024310 30
041320 31
031420 38
021340 34
021430 41
012340 24
031420 38
Time taken by parallel program is : 0.015621 sec

-----
Process exited after 0.06746 seconds with return value 0
Press any key to continue . . .
```

Time Taken by Serial program = 0.046864

Time Taken by Parallel Program = 0.015621

Speedup obtained = $0.046864 / 0.015621 = 2.9985$

