**SCC.361 CW#2 TEMPLATE**

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| **Answer to Q.1 in CW assignment** (After running your GA code for 10 times, what was the average fitness value?  After running the GA code for 10 times, the average  Distance is 103. For fitness value I use the distance, the small  er the distance the better the fitness value. | **Answer to Q.5 in CW assignment** (Report the optimal parameters of your GA algorithm. The parameters include:  **Selection method**: Turnament **Cross\_over method**: Order\_Crossover  **Mutation method**: Swap Mutation **Cross-over probability**: 0.2  **Mutation probability**: 0.1 **Population**= 150 **Generations**= 4000 |
| **Answer to Q.2 in CW assignment** (What path did the most-fit individual in the final generation take through the  cities? | **Question**: What selection/cross-over/mutation operators have been evaluated  and implemented?  You need to provide details. You need to submit all the implementation.  **Selection**: Turnament. Roulette  **Cross-Over**: Order crossover, Partially mapped crossover  **Mutation**: Flip, Swap  You can find the implementations for the above-mentioned methods in the code.  All methods were implemented and tested. |
| **Answer to Q.3 in CW assignment** (Run your GA algorithm 10 times without cross-over operator and report the  average fitness value.  After running the GA code for 10 times without cross over,  the average  Distance is 142. For fitness value I use the distance, bigger  Distance translates to smaller fitness value. | **Question**: How the optimal parameters have been found? E.g. selection, cross-over, mutation, cross-over probability, mutation probability, number of generations, size of population  In order to find the actual parameters I tried each one separately while keeping the  Rest of the parameters stable. The time taken for the code to run was also an  Important parameter for me. Higher Mutation Probability and crossover probability produced better final results but a lot of time was required. For the selection and the crossover and  Mutation methods I used the ones with the lowest time complexity ( less for loops  In for loops) because the improvement was not proportional to the extra time needed  For the code to run. The same logic was used to determine the optimal parameters  Regarding number of generations and size of population. |
| **Answer to Q.4 in CW assignment** (Run your GA algorithm 10 times without mutation operator and report the  average fitness value.  After running the GA code for 10 times without mutation oper,  the average distance is 125. For fitness value I use the distance, bigger  Distance translates to smaller fitness value. | **Question**: here you need to conclude your CW.  Why some operators work well but others not?  Some operators work better because they favour the most powerful chromosomes  When selecting parents and when replacing the old population with the new gene  ration. Additionally, some operators require much more time because they are  more complex and sophisticated than others and those operators often require  numerous nested loops that require more time to run. |

**NOTE: You need to remove all the above text in the template and add yours. The maximum length is one page. Use the same font size (10 – Times New Roman)**