**User Manual for Travelling Salesman Problem - Genetic Algorithm**

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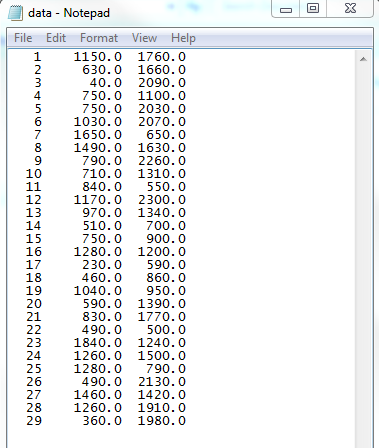
The code is set up to run in Visual Studio with debug mode on. Running the code requires a text file with TSPLIB formatted data. The text file should only contain the city data from the TSPLIB file; the header and EOF should be removed. The picture below shows an example of the correct format.

Figure 1 The Correct Format for City Data File

There is also a global variable named NUM\_CITIES that must be set equal to the number of cities in that data set. Provided with the code base are a few sample data files. The 29 city file (29C27603.txt) is a fast running solution that can be used to demonstrate how the code runs. The name of the provided files states how many cities are in the data and the length of the optimal solution. For example, the file below has an optimal path of 27,603. The file that is read from can be edited by changing the global variable FILE\_NAME.

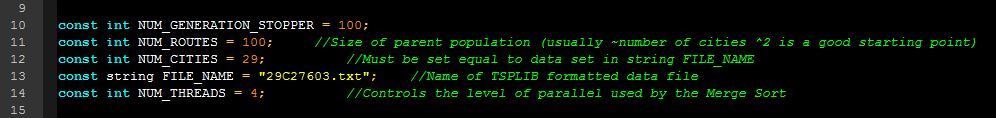


Figure 2: Editable Global Variables to Control Program Execution Heuristics

The parallel solution can be turned on or off by using the Visual Studio master-switch for parallel OMP. This setting can be found under Project Properties -> C/C++ -> Language -> Open MP Support. Another option for turning parallel on or off is the global variable NUM\_THREADS can be set to 1. It is suggested to use the master switch inside of Visual Studio over the variable option however, as due to the way OpenMP works the serial solution might run slower than the true serial solution would with OpenMP turned off completely.

The size of the population is controlled by the NUM\_ROUTES variable. This is the size of the initial and any subsequent generations. This variable requires some tinkering with to find the right size for the data set being used. Higher numbers will result in a much higher run time, but also better solutions. Usually this was set to 1000 to begin with and worked with from there.

The entire code base for the project and the sample data files can be found on GitHub under the following repository: <https://github.com/zgp1001/Genetic-Alg>.