Using evolutionary algorithm presented in lecture slides (using mutation and crossover and checking for validation of solution and measuring its performance, for population of 10 in each generation and for 15000 generation and mutation rate of 5%(of random elements) crossover of (random subset)) I got the following results for part1:

(I have submitted the source code for each part in C++)

1.

I got the following order tour going through the cities:

0, 1, 11, 18, 17, 19, 13, 9, 5, 10, 6, 2, 7, 12, 3, 15, 16, 8, 14, 4

(Cities start from 0 to 19)

Which will have a total cost of: 29

2.

Using the same algorithm I got the following for coloring:

Cities	Color
0	1
18	2
5	3
1	3
4	4
3	5
2	6
6	7
10	8
13	8
8	9
16	10
19	10
17	11
7	11
9	12
14	12
15	13
11	14
12	14

Therefore total number of colors used is: 14