TSP with 20 cities

1. Create 20 cities

Cities

2. Calculate the distance matrix:

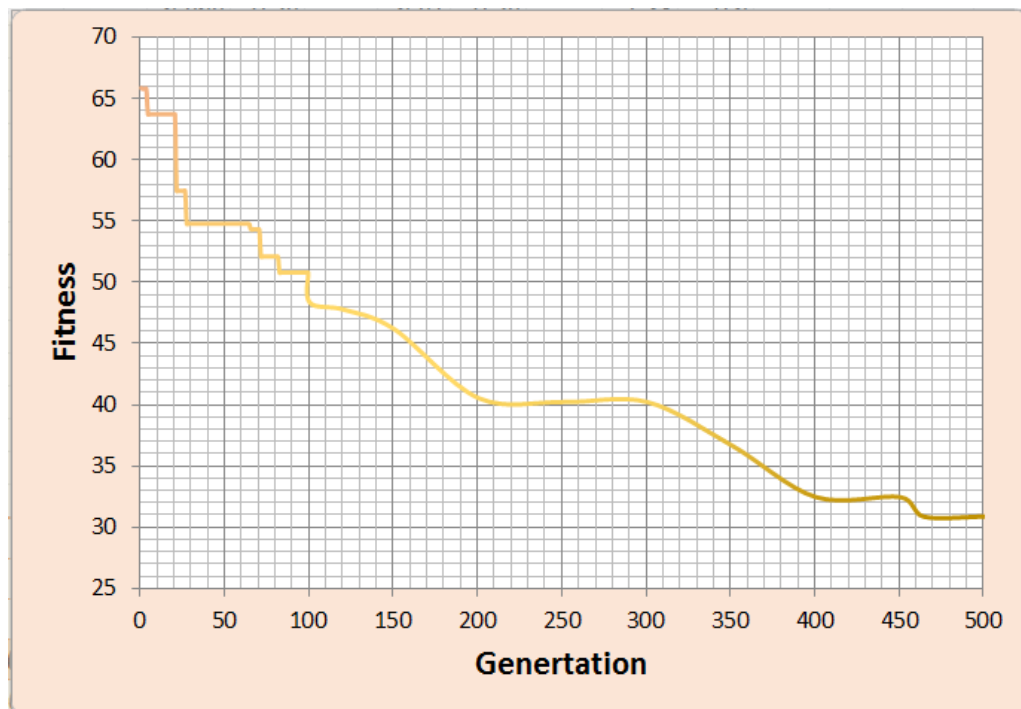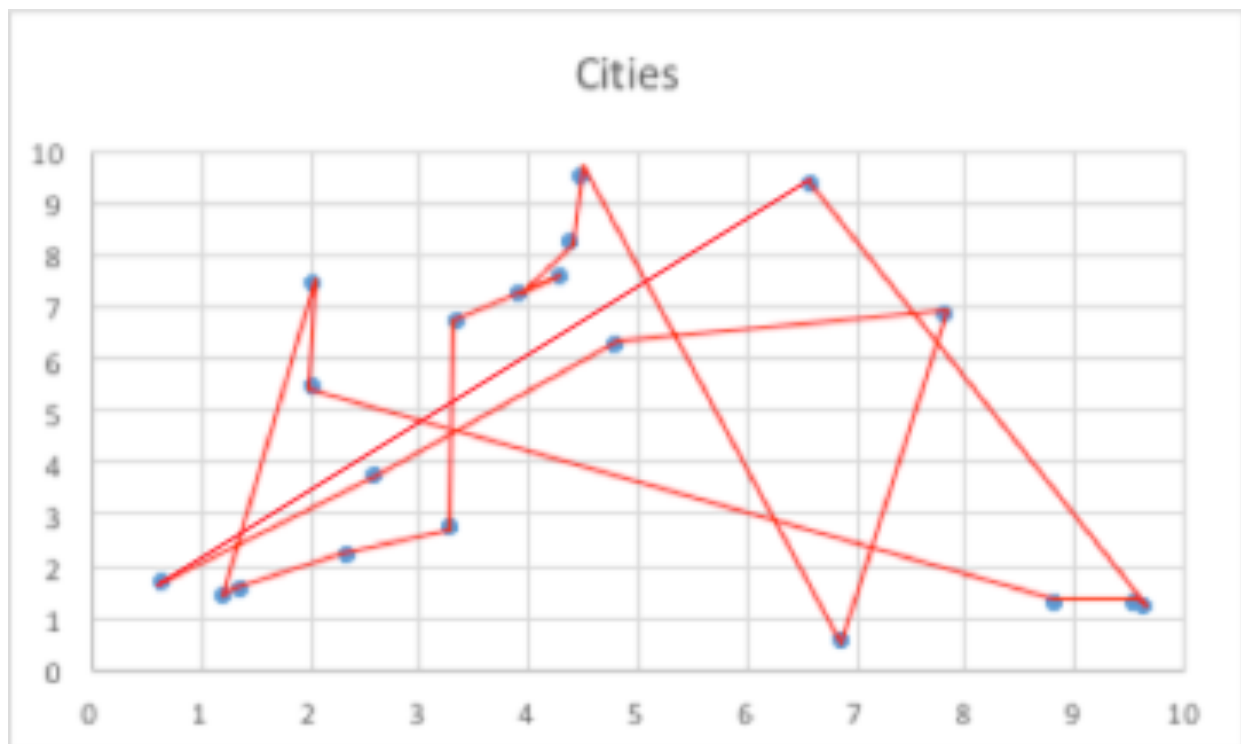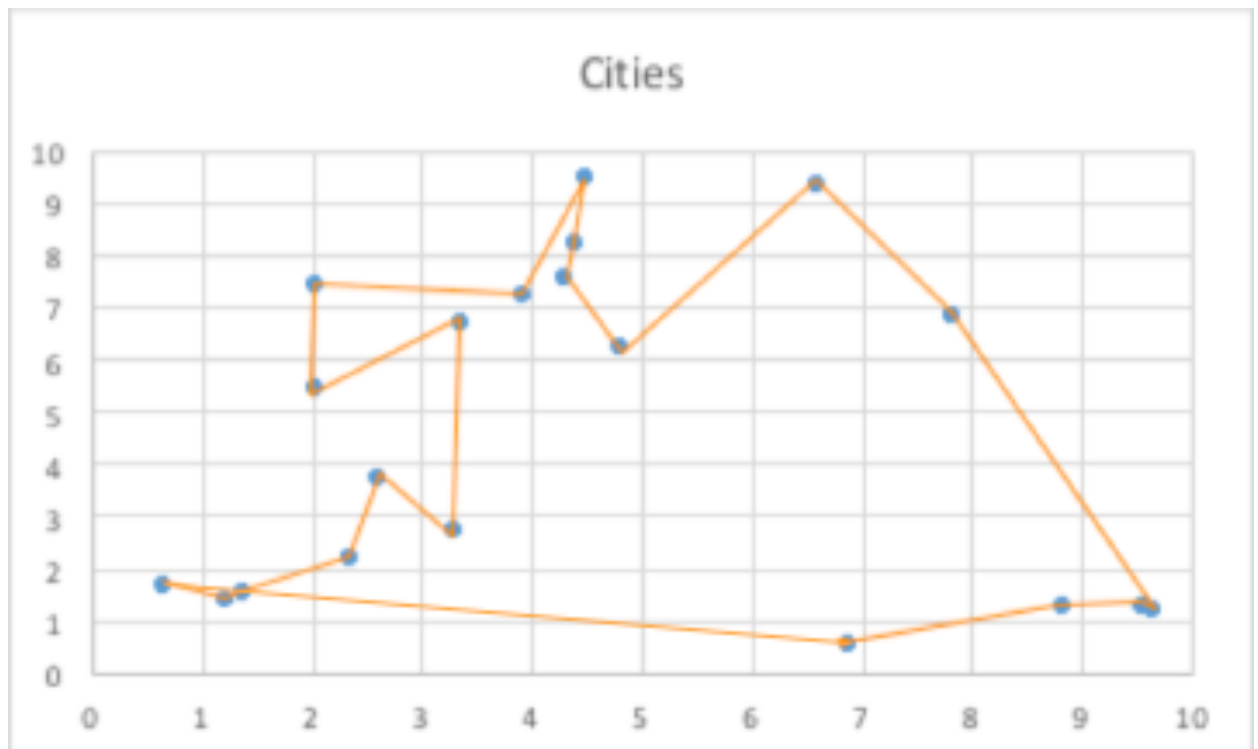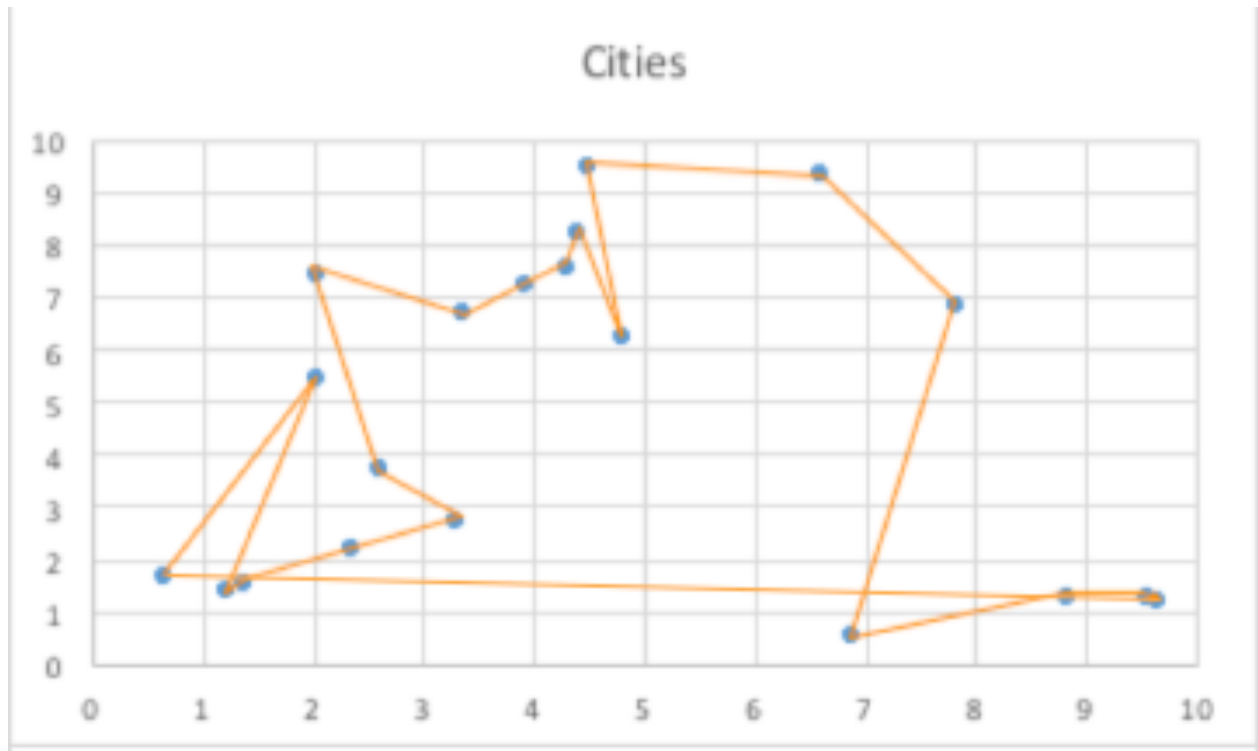| Column1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
A	0	8.2	0.14	6.87	9.7	8.61	8.61	9.61	0.72	8.18	6.42	8.33	7.37	8.23	8.66	8.88	7.24	8.18	2.75	5.84
B		0	8.33	1.43	2.27	3.1	2.89	1.88	7.76	0.53	4.95	6.92	4.19	1.3	0.66	6.96	5.73	6.72	7.51	3.61
C			0	7	9.84	8.75	8.71	9.72	0.84	8.31	6.55	8.45	7.51	8.36	8.78	9.01	7.37	8.31	2.85	5.93
D				0	3.01	2.89	3.58	3.22	6.39	1.31	3.83	6.04	3.34	1.52	2.02	6.2	4.74	5.84	6.09	3.08
E					0	1.94	4.95	3.21	9.16	1.9	4.85	6.08	3.71	1.51	2.5	5.93	5.23	5.92	8.43	5.83
F						0	5.98	4.69	7.99	2.57	3.01	4.16	1.82	1.8	3.63	4.07	3.3	3.99	6.94	5.97
G							0	2.08	8.39	3.42	7.39	9.6	6.88	4.19	2.46	9.72	8.31	9.4	8.83	2.8
H								0	9.25	2.31	6.82	8.71	6.01	2.99	1.23	8.71	7.57	8.52	9.23	4.22
I									0	7.7	5.72	7.61	6.7	7.7	8.25	8.16	6.52	7.46	2.06	5.67
J										0	4.52	6.42	3.71	0.77	1.12	6.46	5.26	6.23	7.32	3.93
K											0	2.47	1.23	3.95	5.6	2.85	1.08	2.27	4.22	6.13
L												0	2.73	5.72	7.54	0.6	1.4	0.21	5.74	8.58
M													0	3.04	4.83	2.86	1.58	2.54	5.37	6.09
N														0	1.86	5.72	4.61	5.53	7.11	4.48
O															0	7.57	6.37	7.35	8.09	3.71
P																0	1.78	0.7	6.33	8.86
Q																	0	1.19	4.83	7.19
R																		0	5.62	8.38
S																			0	6.39
T																				0

3. Apply GA and evolve chromosomes to be the tours of minimum length. Show the graph of fitness vs generation:
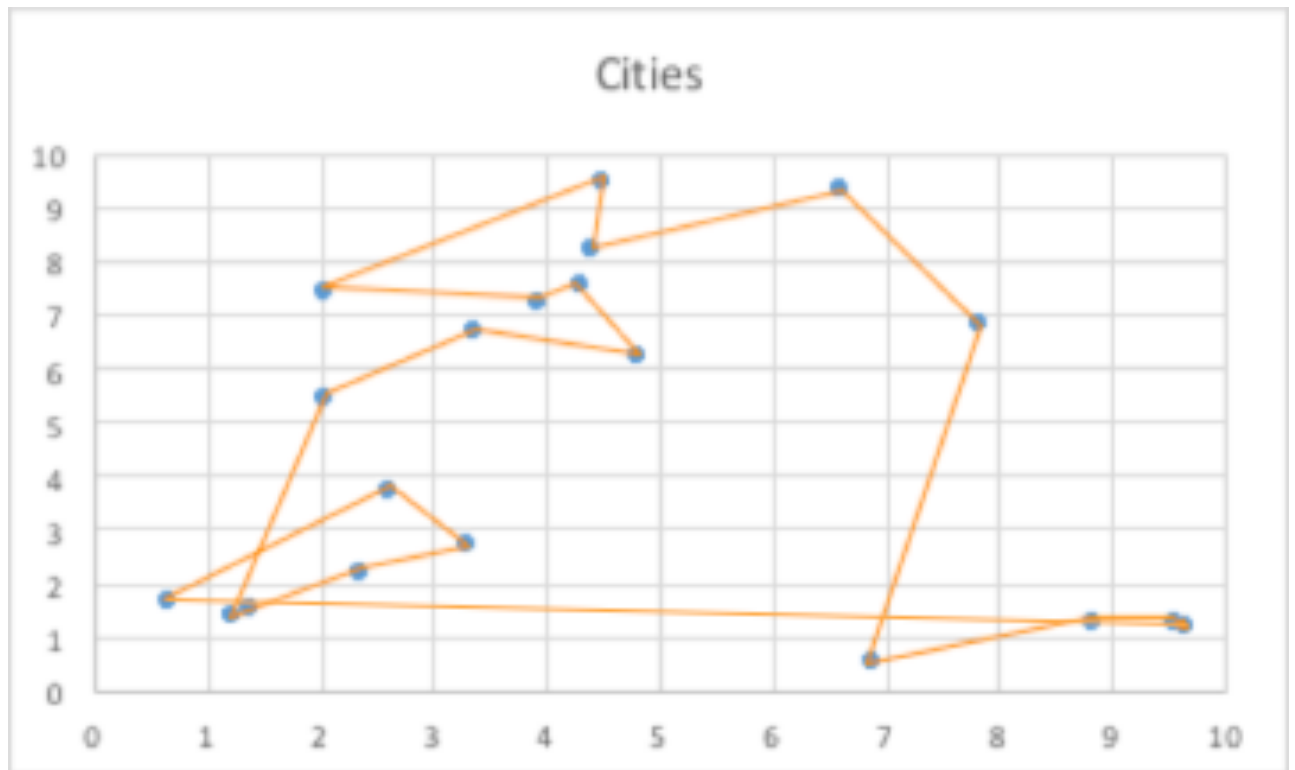

Show the minimum tour in the first generation:

Show three minimum tours in the intermediate generation:

Cities

Cities

Cities

Show the minimum tour in the final generation:

Cities