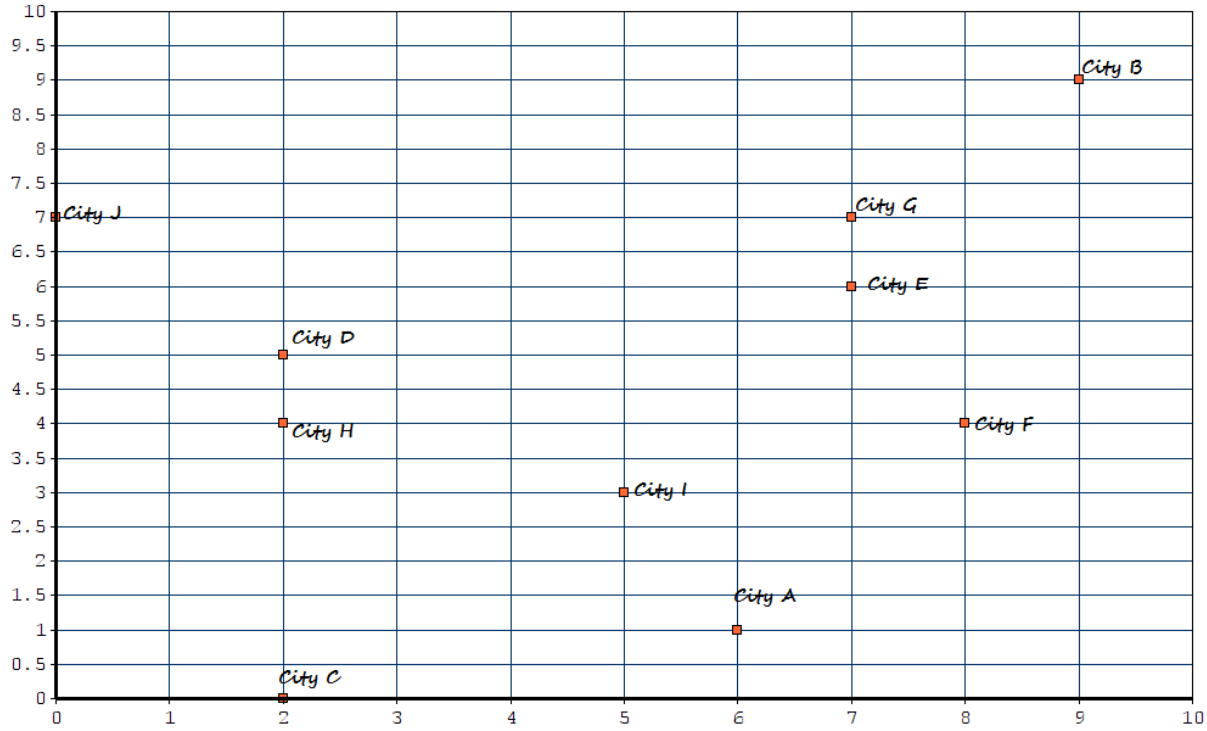
Contemporary Intelligent Information Technology (CIIT)

10/08/18

Travelling Sales Person

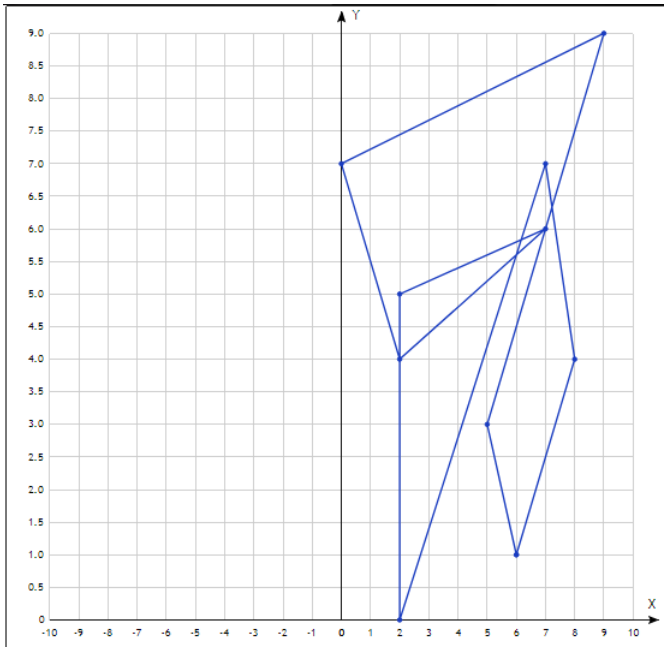
1st: generate 10 cities randomly and find the minimal way using GA. We must visit each city only once.

The first population was generated in a random order:

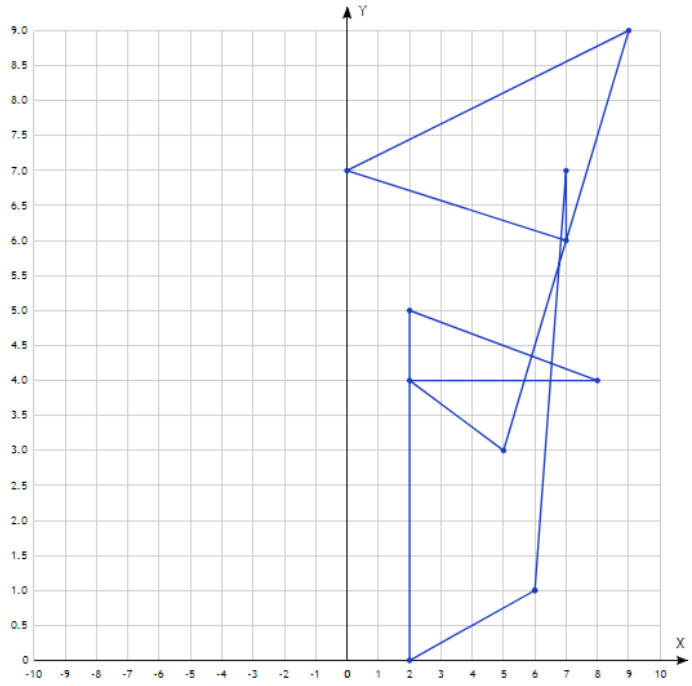


№	Way	Fitness
1	AGEJBIHFDCA	51.17381395658042
2	AIBJHEDCGFA	39.273162586007984
3	ABJDHFIGECA	51.73808284458225
4	AGCBFIJDEHA	60.94152967500595
5	ACEBJDFGIHA	59.383567684964646
6	AHBGFEIJDCA	56.93583242369587
7	AECJBDHGFIA	48.453815301505344
8	AFJIHDCEGBA	50.18864403805483
9	AIGCHEBDJFA	64.06731345672179
10	ACEIBFJGHDA	42.43346898255693

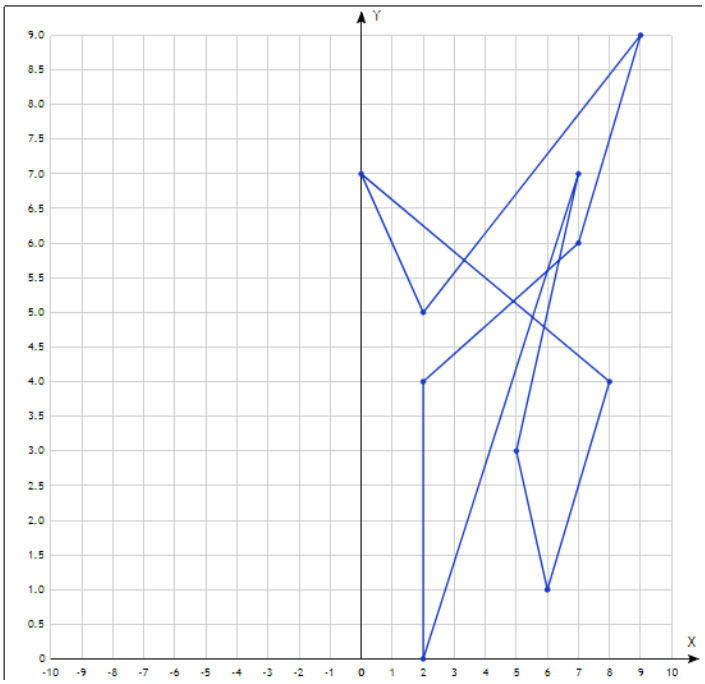
Chromosome with the **best** fitness in the 1st population (№2)



Chromosome with **average** fitness in the 1st population (№1)



Chromosome with the **worst** fitness in the 1st population (№9)

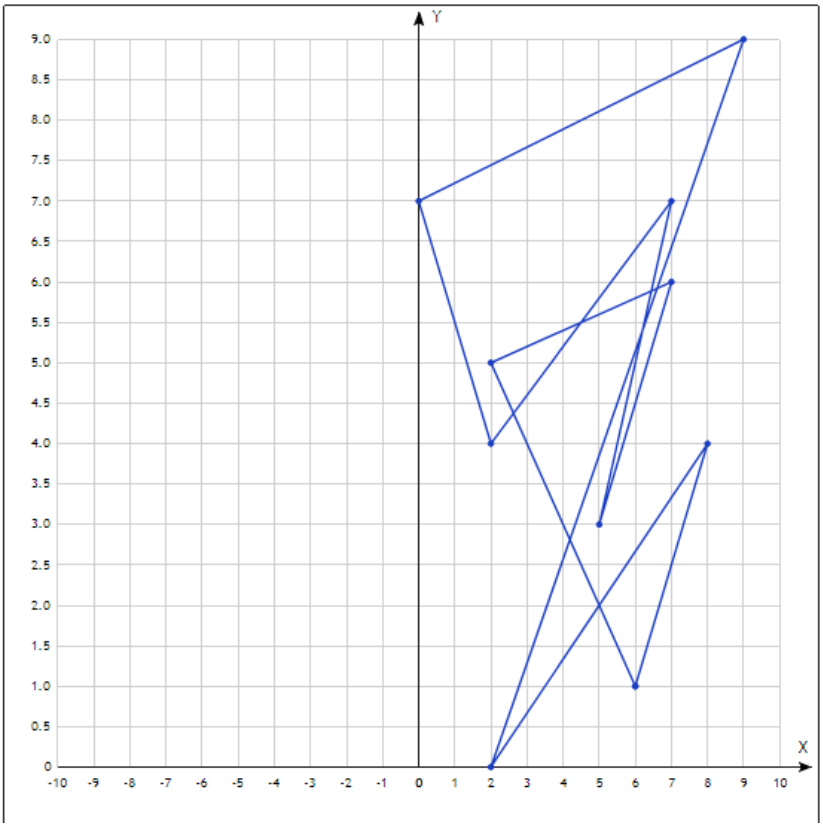


The middle population contains more chromosome with good fitness, than previous ones:

Number of chromosome	Way	Fitness
1	AGEBJIHFCDA	47.17381395658042
2	AIBJHEDCGFA	39.273162586007984
	…	
8	AFJIHGCEDBA	41.18864332805483
9	ACIGHEBDJFA	52.067313455742179
10	ABEICFJGHDA	44.43432498255693

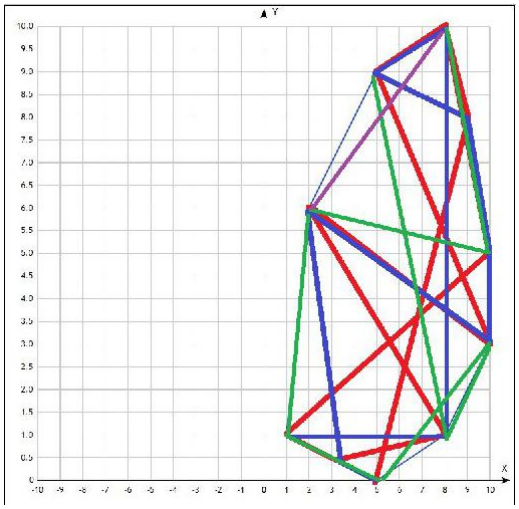
The last population contains the shortest way:

Number of chromosome	Way	Fitness
1	ADEIGHJBCFA	29.677705038759903
2	ABJDHIGFECA	33.73808324458225
3	ACGBFIJDEHA	31.94152967534595
4	ACEBFDJGIHA	32.383567684964646
5	ABGHFEIDJCA	29.93583242369587
6	AEIJBHDGFCA	34.453815301505344
7	AIBJHEDCGFA	39.273162586007984
8	AIBJHCDEFGA	32.273162586007984
9	ADBJHFIGECA	30.762474458225
10	AGCFBIJHEDA	29.94152967500595



2nd: generate 10 cities in a circle and find the minimal way using GA.

The first population (round order):



The last population contains the shortest way:

ABCDEFGHIJA (Fitness 28.3457844578475)