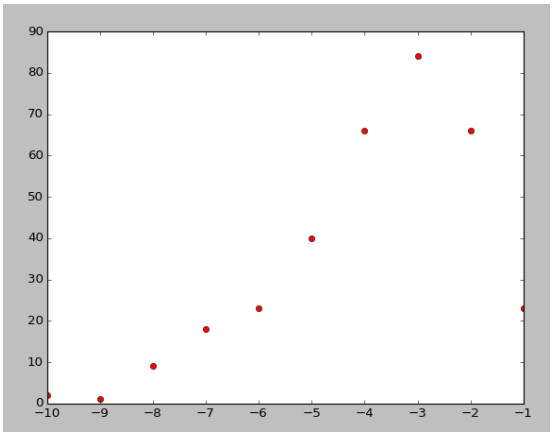
CISC889HW1: Shiyi Chen

Part B:

Temperature = 1 (only a few configuration are accepted)

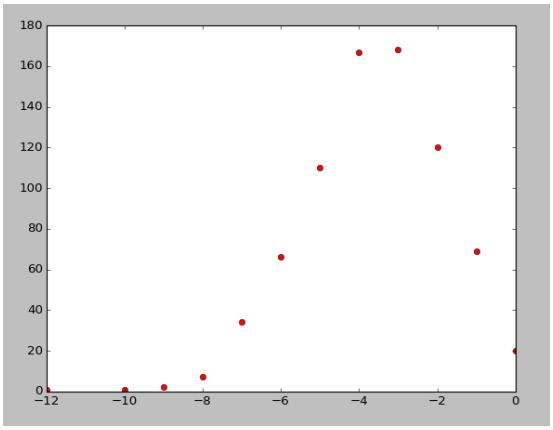
Energy	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Configuration Count	23	66	84	55	40	23	18	18	9	2

Graph:



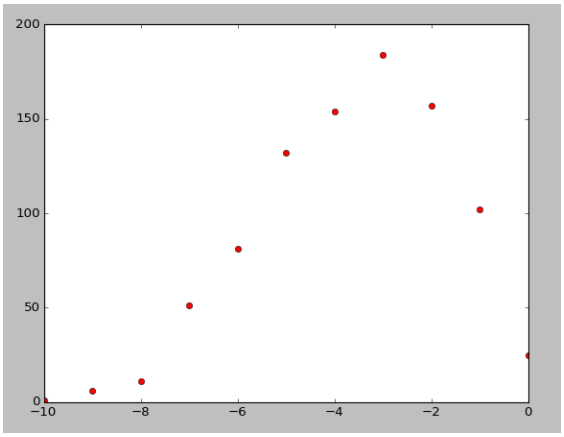
Temperature = 2 (more configurations are accepted)

Energy	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-12
Configuration Count	20	69	120	168	167	110	66	3	7	2	1	1



Temperature = 4 (even more configurations are accepted)

Energy	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Configuration Count	25	102	157	184	154	132	81	51	11	6	1



I have a possible explanation for this kind of distribution. When trying to make random change to a configuration, I only flip three digits (there are 170 digits in total). This means that the baby step is really really small, hence we end up with distribution like this.

Part C:

Population size = 500

Iteration = 100

Initial population lowest energy: -16

Final lowest energy = -29

Optimal configuration:

01100101011001100100001100001110111100111100010000111011111110011011101100111111000101010011000000111011100110111100111110011001101111001111001111100110101110010100000110

AND

10011001100110101100110011110011000100001110111010110011101011101100001110101111000100001110111010110000111011100110111011101111001110111001100100011001100110111011000011

AND

10111011111110100100010110010100110001011001011011100110010101011011111001010110111
11110010110101100111110011011110011111001100110010001100100010001100110101011110000
0110

AND …

Execution time: 32 seconds