HW3 Report

0656511 黃誠發

Programming Language: C++

(a)

Code representation：

49	fin.open("test1.txt"); you can choose the input files
113	random the vertex to decide whether run the MIS decision function
151	count for the determination times
152~155	if there are enough times for check the MIS to leave
162	count converge times

1. Is it possible that HW3a does not stop for some input? Why?

It is not possible that no stop. We can eliminate a condition that if the nodes have same priority to be tied and make the result of no stop through only deciding one node to determine joining to the MIS in each round. After former round, we can find the MIS.

2. If HW3a does stop for some input file, please list all possible results (one line for each set of duplicated results) with respective percentages.

Input 1:

```
{ 0 3 4 5 7 8 } ---> Probability: 40.1 %
{ 1 4 5 7 8 9 } ---> Probability: 59.9 %

Process returned 0 (0x0)   execution time : 0.064 s
Press any key to continue.
```

Input 2:

```
{ 4 5 6 8 } ---> Probability: 100 %

Process returned 0 (0x0)   execution time : 0.557 s
Press any key to continue.
```

3. Are all these results correct (independent sets)?

Yes, those are correct.

(b)

Code representation：

50 fin.open("test1.txt"); you can choose the input files

111 for random the probability the vertexes to decide whether run the MIS decision function

150 count for the determination times

151~154 if there are enough times for check the MIS to leave

1. Is it possible that HW3b does not stop for some input? Why?

It is possible that no stop. We also use the same concept to break tie as HW3(a), so we can eliminate the condition when the tie happened. When it ties, we will randomize the node to break tie. But what if the probability p = 1, it will become the same question HW2b, which it will stuck in a tie.

2. If HW3b does stop for some input file, please list all possible results (one line for each set of duplicated results) with respective percentages.

Input 1:

```
{ 0 3 4 5 7 8 } ---> Probability: 49.2 %
{ 1 4 5 7 8 9 } ---> Probability: 50.8 %

Process returned 0 (0x0)   execution time : 2.264 s
Press any key to continue.
```

Input 2:

```
{ 4 5 6 8 } ---> Probability: 100 %

Process returned 0 (0x0)   execution time : 2.216 s
Press any key to continue.
```

3. Are all these results correct (independent sets)?

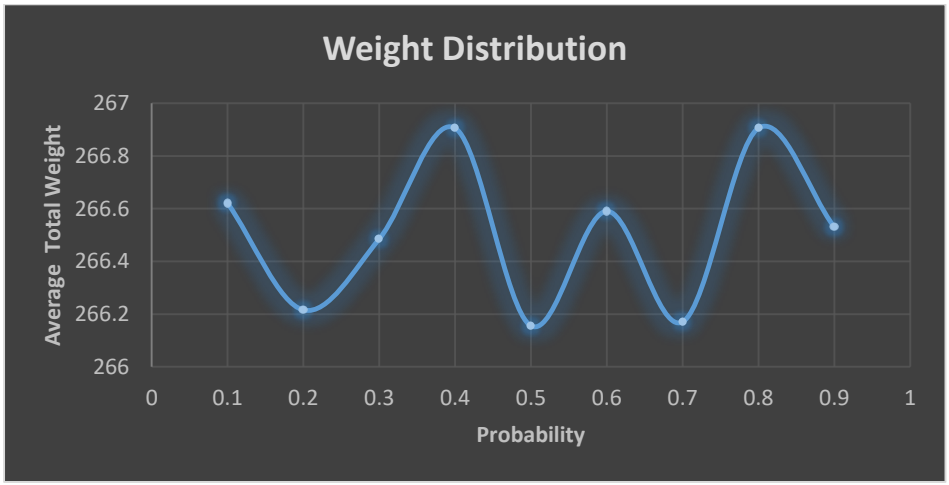
Yes, those are correct.

(c)

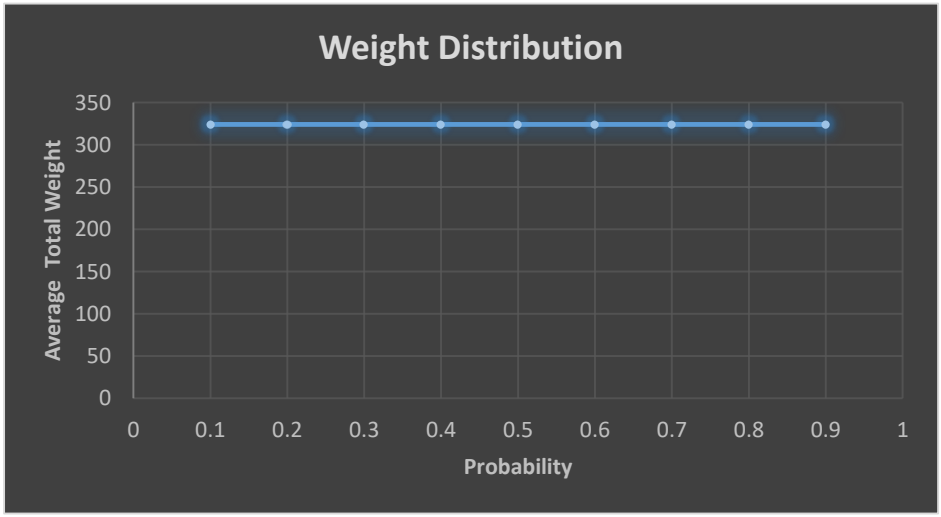
The code is similar to the former two pieces
But,
176 set the variable “final_run” to calculate the converge time
260~261 output the mean weight and converge time to file, “output2.txt”
The mean weights are calculated with the production of probabilities of each weight and its total weight.
Final, I use the excel to show my x-y plot with the output file “output2.txt”.

1. Use a x-y graph to show how averaged total weight changes with the setting of *p*.

Input 1:

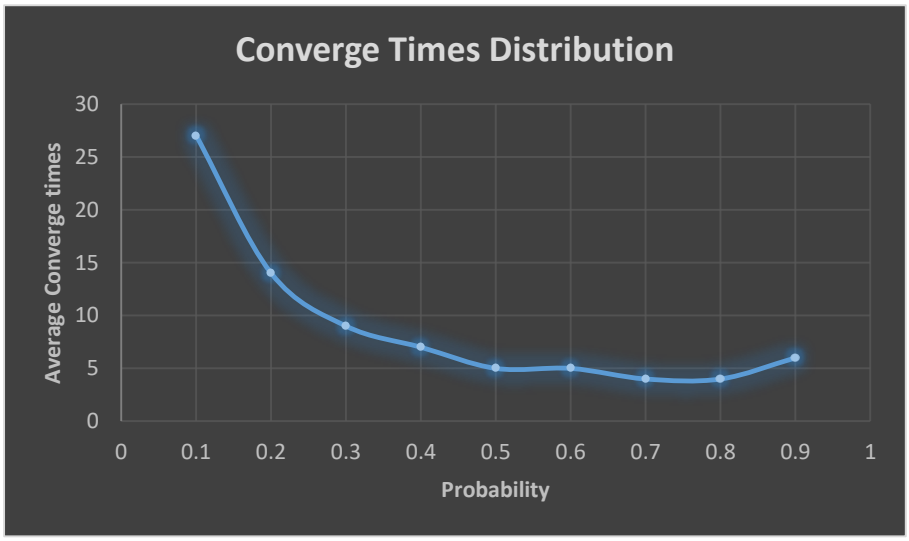


Input 2:



2. Use a x-y graph to show how averaged convergence time changes with the setting of *p*.

Input 1:



Input 2: