

HW#2 For test1.txt

Q (a)

Yes, these tests produced the same result.

```
(1, 4, 5, 7, 8, 9) : 1.0
```

Q (b)

1.

Yes, it is possible that HW2b for test1.txt would not stop for some input.

Because if the initial value of nodes whose weight / (degree + 1) are the same are all set the same value, the program would not stop.

2.

Yes, these results are all independent sets.

```
(1, 4, 5, 7, 8, 9) : 0.247  
(0, 3, 4, 5, 7, 8) : 0.265  
infinite : 0.488
```

Q (c)

1.

No, it would stop for sure.

Because even if the initial value of nodes whose weight / (degree + 1) are the same are all set the same value, the program would choose to set all of them in Maximal independent weight set.

2.

No, the result is not a independent set.

```
(1, 3, 4, 5, 7, 8) : 1.0
```

Q (d)

I think the initial value is important.

So I figure out that if the nodes have the same weight / (degree + 1) value, they should not be all set in the same initial value. The way I suggest is After all the initial values are set randomly, I choose randomly one of the adjacent nodes which have the same weight / (degree + 1) value to be in the set and others would be out of the set.

```
(0, 3, 4, 5, 7, 8) : 0.494  
(1, 4, 5, 7, 8, 9) : 0.506
```

HW#2 For test2.txt

Q (a)

Yes, these tests produced the same result.

```
[TonyHude-MacBook-Pro:hw2 bluesky$ python3 HW2a.py  
(4, 5, 6, 8) : 1.0
```

Q (b)

1.

No, it is **not** possible that HW2b for test2.txt would not stop for some input.

Because the test2.txt doesn't have the nodes which have the same weight / (degree + 1) value are adjacent each other.

2.

Yes, the result is independent sets.

```
[TonyHude-MacBook-Pro:hw2 bluesky$ python3 HW2b.py  
(4, 5, 6, 8) : 1.0
```

Q (c)

1.

No, it would stop for sure.

Because even if the initial value of nodes whose weight / (degree + 1) are the same are all set the same value, the program would choose to set all of them in Maximal independent weight set.

But in this case, it doesn't have the nodes which have the same weight / (degree + 1) value are adjacent each other.

2.

Yes, the result is a independent set.

```
[TonyHude-MacBook-Pro:hw2 bluesky$ python3 HW2c.py  
(4, 5, 6, 8) : 1.0
```

Q (d)

There is the result for test2.txt in HW2d.py.

```
[TonyHude-MacBook-Pro:hw2 bluesky$ python3 HW2d.py  
(4, 5, 6, 8) : 1.0
```