

1. Conclusion about the relationship between d , n and l

Based on the experiment and logical conduction, the theoretical relationship between them is

$$d = l\sqrt{n}$$

However, the experiments show that the d is a little smaller than $l\sqrt{n}$.

2. Evidence to support the relationship

Experiment Times	Steps (n)	Distance (d)
30	10	2.700355650674462
30	100	9.542557452430563
30	1000	24.192511287786214
30	10000	91.31568040760989
1000	10000	90.82347778504865
10000	10000	87.38722399314534
30	40000	167.7519213865373
30	160000	335.6903793084376

Table 1 Results between d and n

We did experiments with different steps (n), assuming the length of every step(l) is 1. Every n we did 30 times experiments. The results show that the distance(d) is close to the conclusion we made above.

However, as you can see from Table 1, the Distance(d) is slightly smaller than $l\sqrt{n}$, even when we are changing the steps and experiment times.

3. Code(in the attached files)

4. Evidence of the unit test all passing

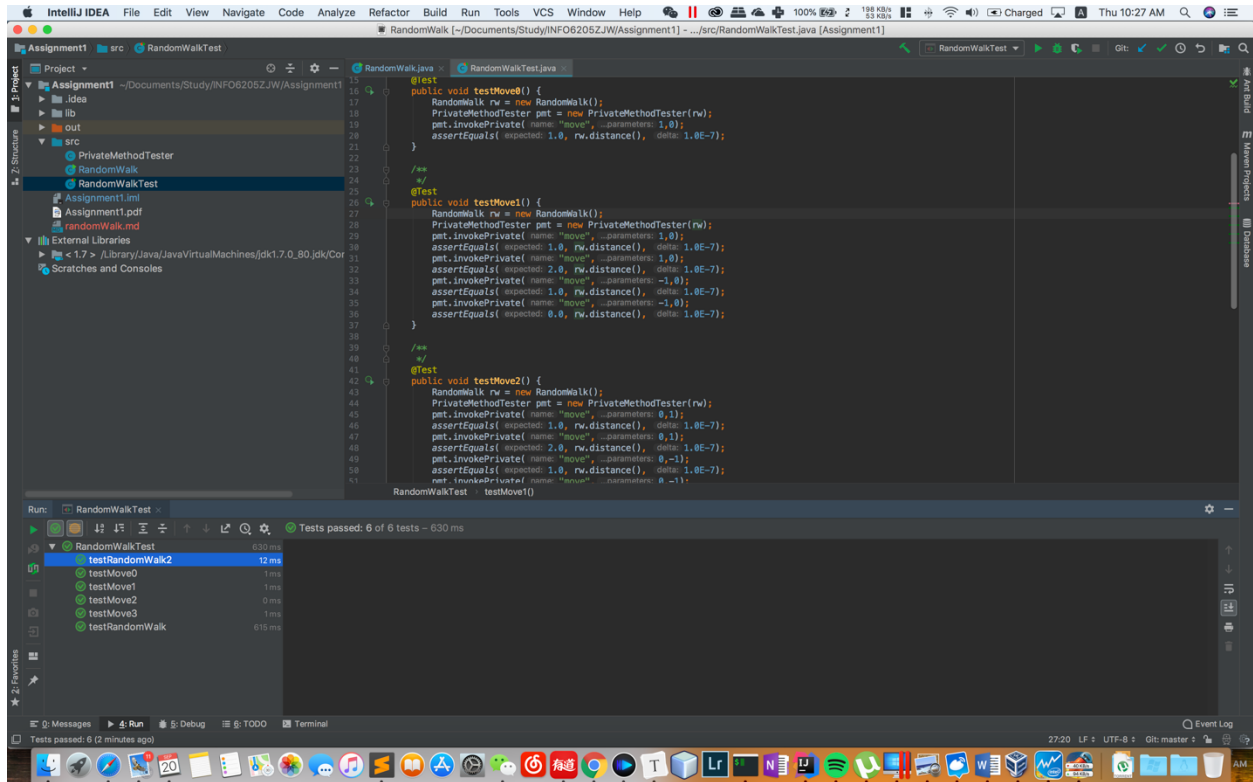


Figure 1 All unit tests pass