Peng Chen (001098655)

**Program Structures & Algorithms**

**Fall 2021**

**Assignment No.1**

**Task:**

1. Your conclusion about the relationship between d and n;
2. Your evidence to support that relationship (screen shot and/or graph and/or spreadsheet);
3. Your code (RandomWalk.java plus anything else that you changed or created);
4. A screen shot of the unit tests all passing.

**Relationship:**

**Evidence:**

I have tested n = [1, 2, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 150, 200] steps. For every element in n, I did 10 experiments. And in every experiment, I tested 100 times of each n value, then calculated the mean of these 100 results. Please see Assignment1.xlsx for more detail.

I also wrote a Python script to draw the picture in Graphical Representation part. The Python code is ShowRes.ipynb.

All figures of this report are in img folder.

* Output:

1 step:

Graphical user interface, text

Description automatically generated

2 steps:

Graphical user interface, text, application

Description automatically generated

5 steps:

Graphical user interface, text, application

Description automatically generated

10 steps:

Graphical user interface, text

Description automatically generated

20 steps:

Graphical user interface, text

Description automatically generated

30 steps:

Graphical user interface, text

Description automatically generated

40 steps:

Graphical user interface, text

Description automatically generated

50 steps:

Graphical user interface, text

Description automatically generated

60 steps:

Graphical user interface, text

Description automatically generated

70 steps:

Graphical user interface, text

Description automatically generated

80 steps:

Graphical user interface, text

Description automatically generated

90 steps:

Graphical user interface, text

Description automatically generated

100 steps:

Graphical user interface, text

Description automatically generated

150 steps:

Graphical user interface, text

Description automatically generated

200 steps:

Graphical user interface, text

Description automatically generated

* Graphical Representation:

Chart, line chart

Description automatically generated with medium confidence

* Unit tests results:

Text

Description automatically generated