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Program Structures & Algorithms

Fall 2021

Assignment No. 1

⊙ **Task (List down the tasks performed in the Assignment)**

- Implement the methods
- Deduce the relationship
- Provide evidence
- Pass unit Test

⊙ **Relationship Conclusion:**

○ $d = \sqrt[2]{0.787 * n - 0.065}$

⊙ **Evidence to support the conclusion:**

Refer to README.md for more information

1. Output (Snapshot of Code output in the terminal)

```
/Library/Java/JavaVirtualMachines/jdk1.8.0_144.jdk/Contents/Home/bin/java ...
```

```
Run 10000 experiments for each n from 1 to 512 and
```

```
1 steps: 1.0 over 10000 experiments
```

```
2 steps: 1.2047286065935556 over 10000 experiments
```

```
3 steps: 1.5958851663376044 over 10000 experiments
```

```
4 steps: 1.762905940398115 over 10000 experiments
```

```
5 steps: 2.0155270458299785 over 10000 experiments
```

```
6 steps: 2.146434316923342 over 10000 experiments
```

```
7 steps: 2.3641280973871455 over 10000 experiments
```

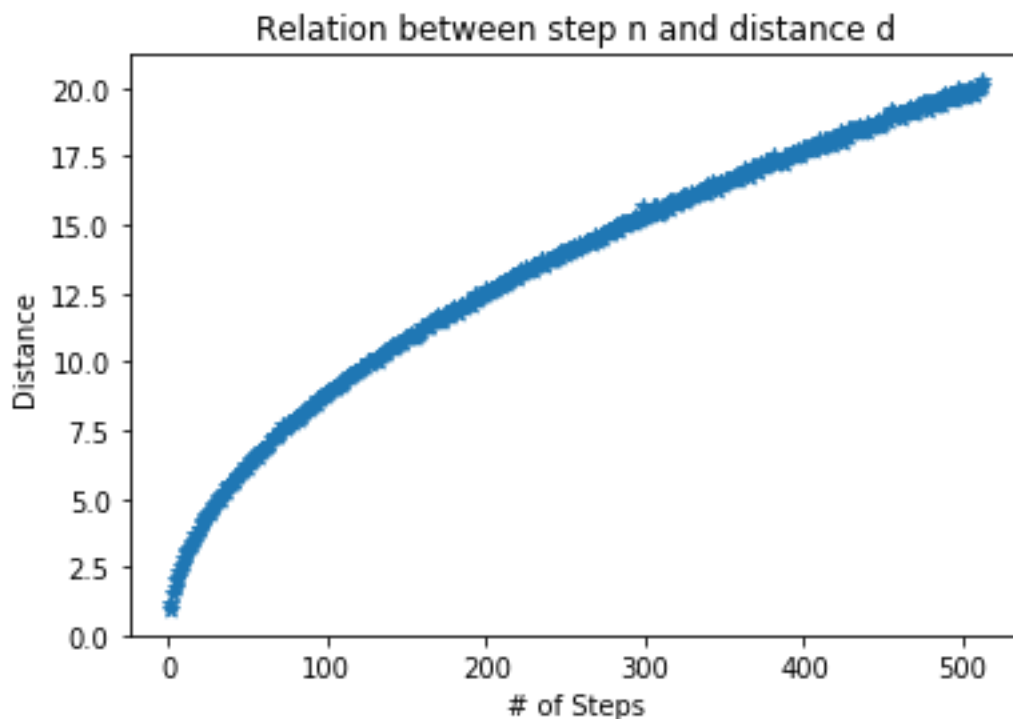
```
8 steps: 2.501182869516462 over 10000 experiments
```

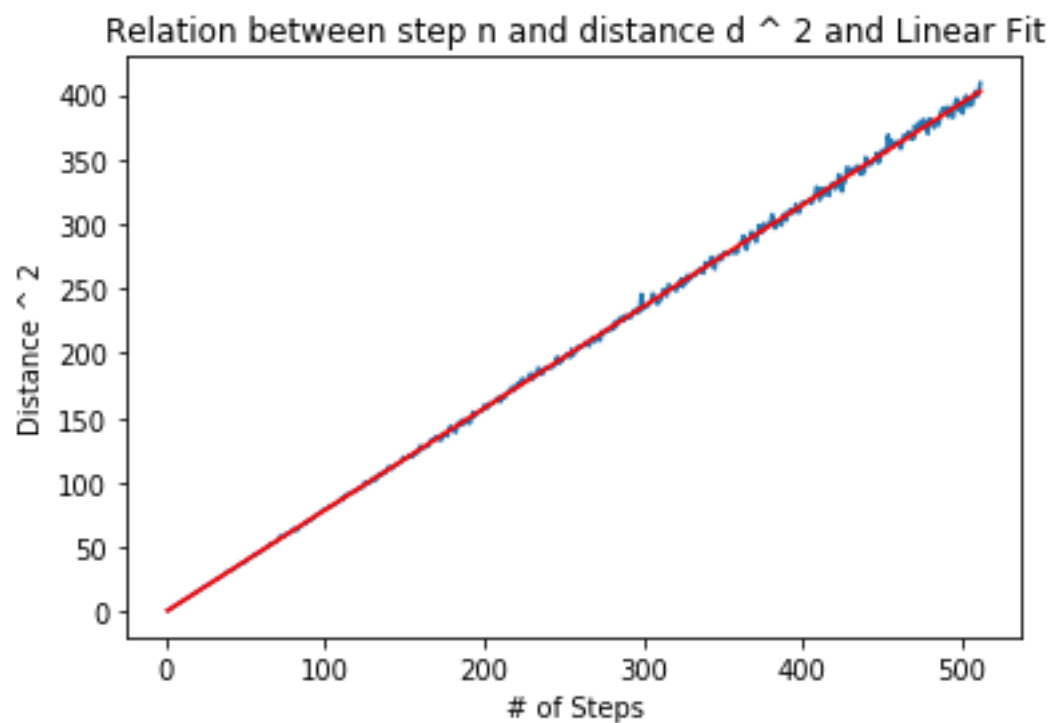
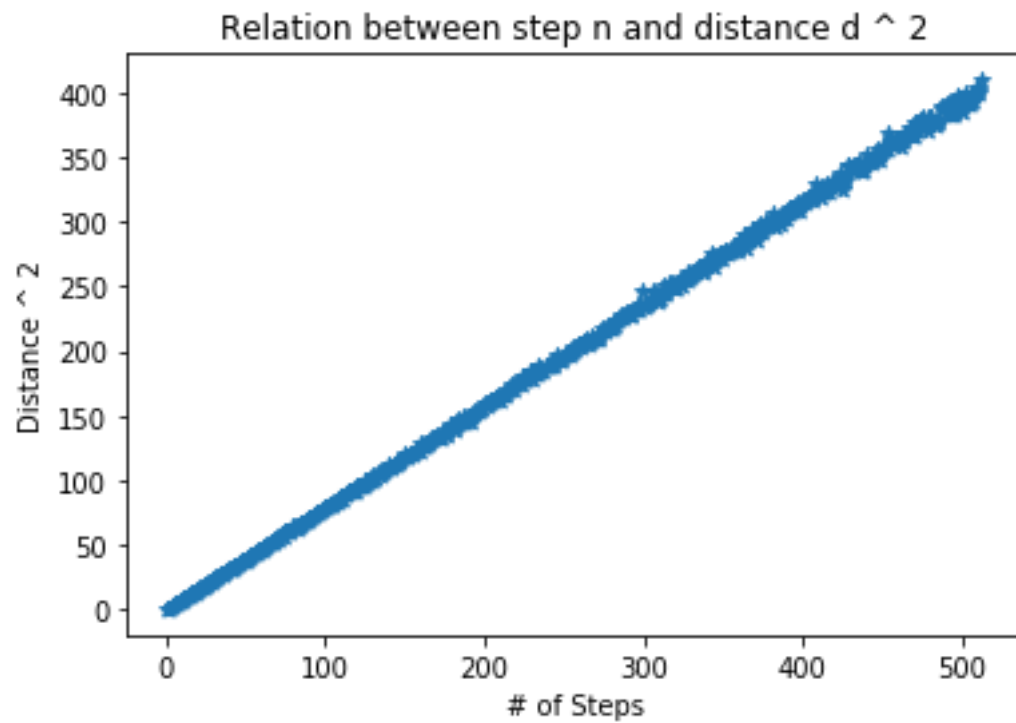
```
9 steps: 2.6981030603584473 over 10000 experiments
```

```
10 steps: 2.8001106096331037 over 10000 experiments
```

```
11 steps: 2.9604806378606656 over 10000 experiments
```

2. **Graphical Representation(Observations from experiments should be tabulated and analyzed by plotting graphs(usually in excel) to arrive on the relationship conclusion)**





- Unit tests result:(Snapshot of successful unit test run)

| Run: RandomWalkTest × | | |
|--|--|--------|
| <div><div>▶</div><div>✓</div><div>⊘</div><div>↓^a</div><div>↓_≡</div><div>≡</div><div>÷</div><div>↑</div><div>↓</div><div>🔍</div><div>↶</div><div>↷</div><div>⚙️</div><div>✓</div></div> | | |
| ▼ | ✓ RandomWalkTest (edu.neu.coe.info6205.randomwalk) | 383 ms |
| | ✓ testRandomWalk2 | 16 ms |
| | ✓ testMove0 | 32 ms |
| | ✓ testMove1 | 7 ms |
| | ✓ testMove2 | 16 ms |
| | ✓ testMove3 | 8 ms |
| | ✓ testRandomWalk | 304 ms |