# Program Structures & Algorithms Fall 2021 Assignment No. 1

### Tasks:

- Calculated (Euclidean) distance from the origin (the lamp post) to the destination(position after the random walk).
- Ran the same experiment with various numbers of steps and 50 times for each value of steps.
- o Derived the relationship between the number of steps and the distance covered.

## • Relationship Conclusion:

# • Evidence to support the conclusion:

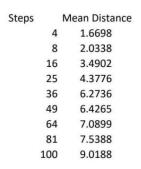
1. The output of the program:

### James Shah(NUID - 002107975)

```
Run: RandomWalk ×

| Vusr/lib/jvm/java-1.11.0-openjdk-amd64/bin/java ... |
| 4 steps: 1.6698256536101197 over 50 experiments |
| 8 steps: 2.0338578460626007 over 50 experiments |
| 16 steps: 3.490237484836728 over 50 experiments |
| 25 steps: 4.377679844719308 over 50 experiments |
| 36 steps: 6.2736783437040184 over 50 experiments |
| 49 steps: 6.426565244750359 over 50 experiments |
| 64 steps: 7.089987790451094 over 50 experiments |
| 81 steps: 7.53886048343617 over 50 experiments |
| 100 steps: 9.018816668786746 over 50 experiments |
| 100 steps: 9.018
```

### 2. Graphical Representation:





### • Unit Tests Results:

### James Shah(NUID - 002107975)

