Programming Structures & Algorithms
Spring 2022
Assignment no: 1

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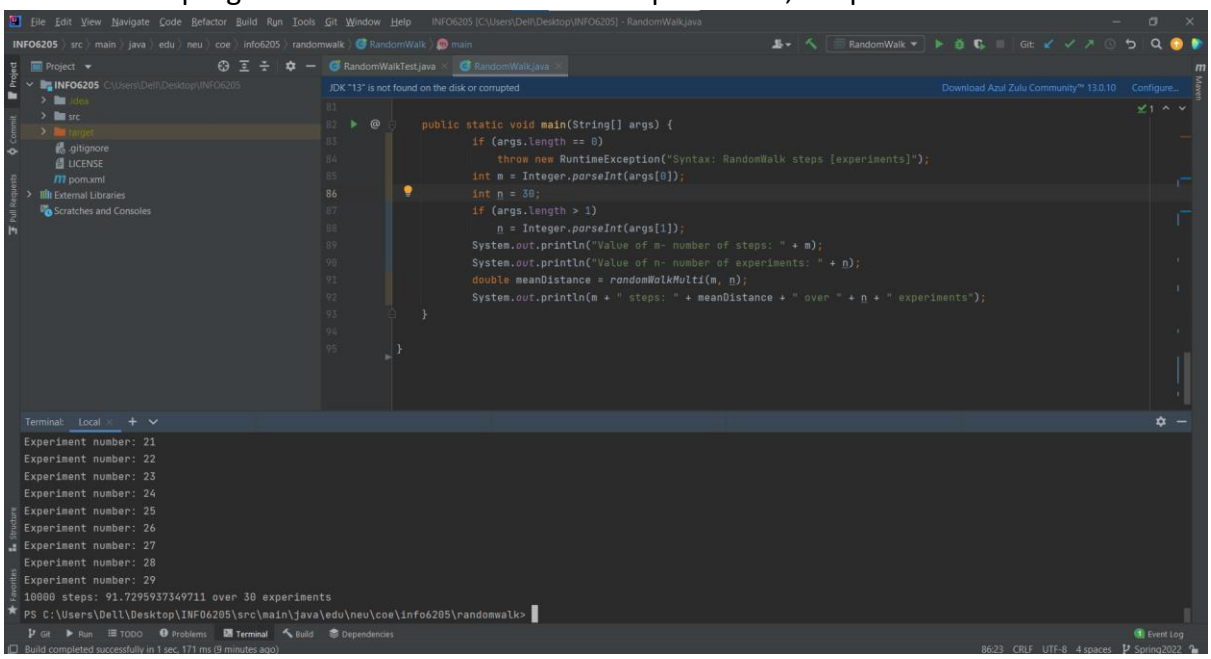
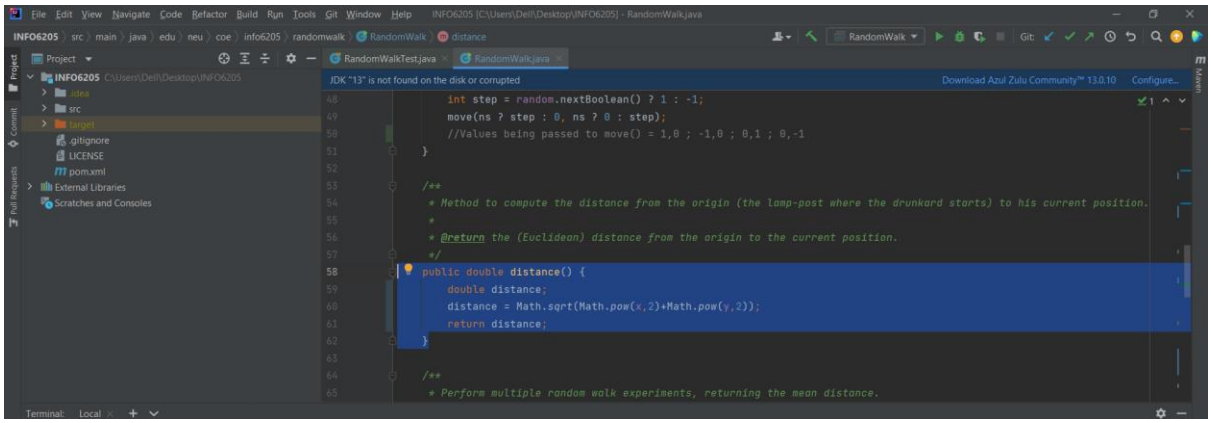
Assignment task:

a) To find out the Euclidean distance between the lamp post and the current position of the drunken man
b) Deduce the relationship between Euclidean distance(d) and number of steps(n)
c) Pass all the unit test cases and provide a screenshot
d) Code changes

a) Executed the program for 6 values of n over 30 experiments; Output screenshot:



Formula for calculating distance d:



$$D = \sqrt{x^2 + y^2}$$

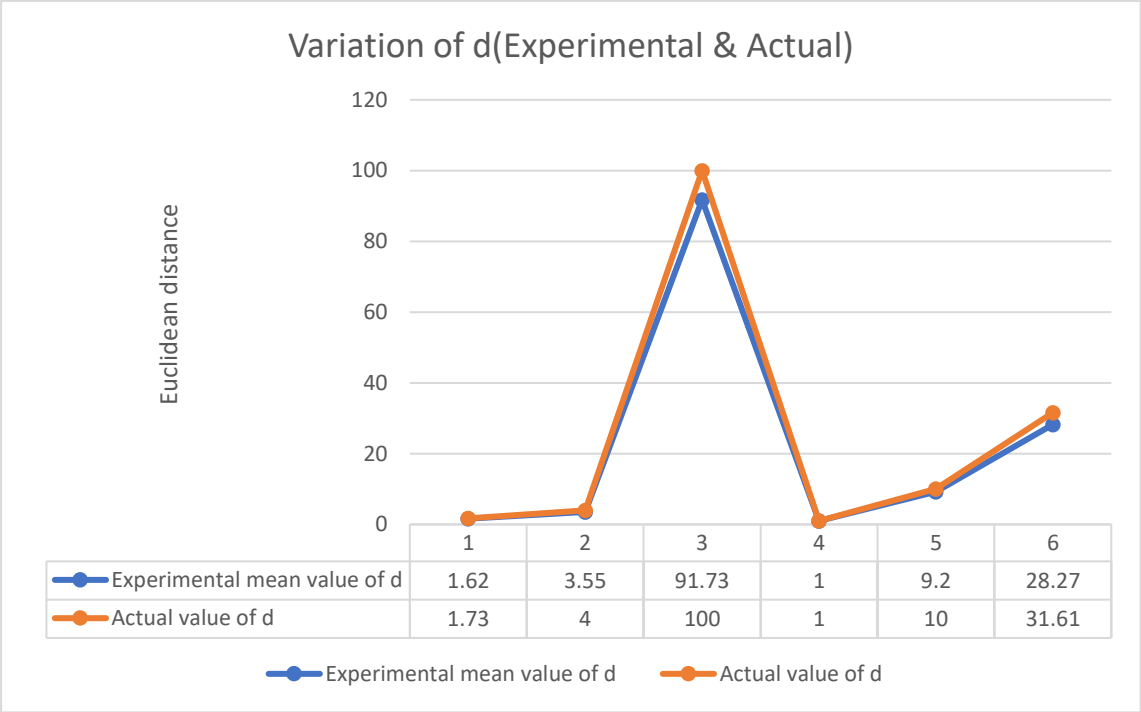
b) After executing the experiment for over 6 values of n, from the below observations I can conclude that d and n are related as below –

$$D = \sqrt{n}$$

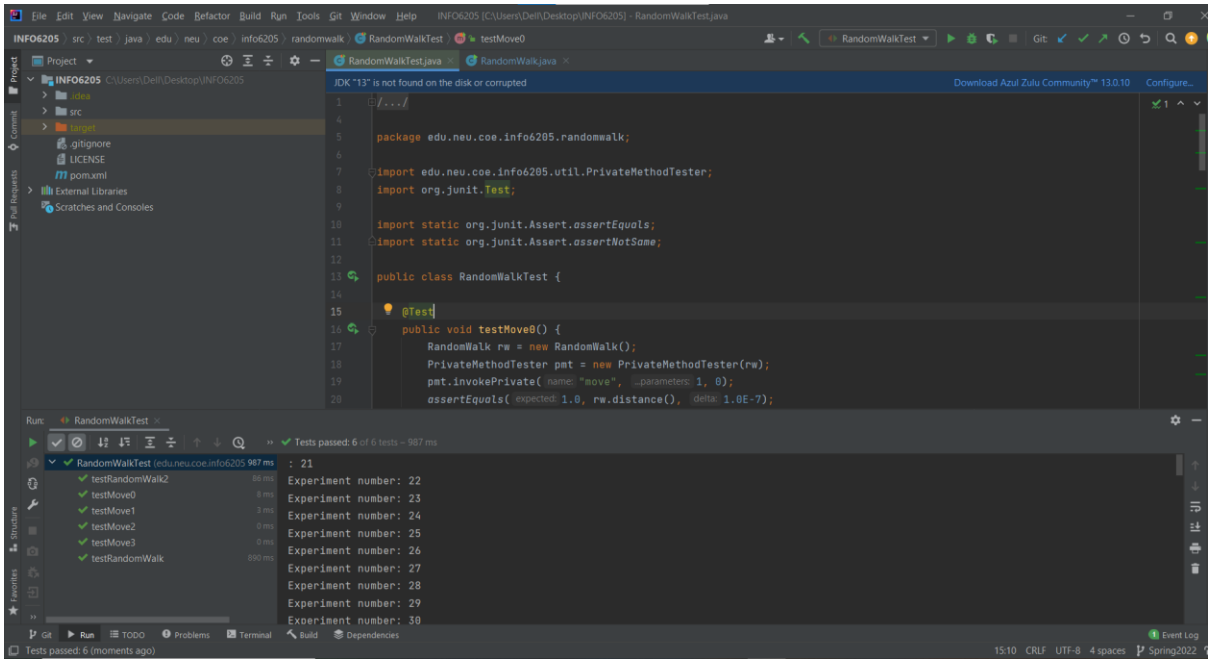
Evidence:

n	Mean experimental value of d	Actual Value of d = SQRT of n
3	1.62	1.73
16	3.55	4
10000	91.73	100
1	1	1
100	9.2	10
999	28.27	31.61

Variation of d with different values of n:



c) Screenshot of all unit test cases passing –


File Edit View Navigate Code Refactor Build Run Tools Git Window Help
INFO6205 [C:\Users\Dell\Desktop\INFO6205] - RandomWalkTest.java
INFO6205 src test java edu neu coe info6205 randomwalk RandomWalkTest testMove0
RandomWalkTest
Git:
Project
INFO6205 C:\Users\Dell\Desktop\INFO6205
.idea
src
target
.gitignore
LICENSE
pom.xml
External Libraries
Scratches and Consoles
RandomWalkTest.java
RandomWalk.java
JDK "13" is not found on the disk or corrupted
Download Azul Zulu Community™ 13.0.10
Configure...
/.../
package edu.neu.coe.info6205.randomwalk;
import edu.neu.coe.info6205.util.PrivateMethodTester;
import org.junit.Test;
import static org.junit.Assert.assertEquals;
import static org.junit.Assert.assertNotSame;
public class RandomWalkTest {
@Test
public void testMove0() {
RandomWalk rw = new RandomWalk();
PrivateMethodTester pmt = new PrivateMethodTester(rw);
pmt.invokePrivate(name: "move", _parameters: 1, 0);
assertEquals(expected: 1.0, rw.distance(), delta: 1.0E-7);
Run: RandomWalkTest
Tests passed: 6 of 6 tests – 987 ms
RandomWalkTest (edu.neu.coe.info6205 987 ms
testRandomWalk2 86 ms
testMove0 8 ms
testMove1 3 ms
testMove2 0 ms
testMove3 0 ms
testRandomWalk 890 ms
: 21
Experiment number: 22
Experiment number: 23
Experiment number: 24
Experiment number: 25
Experiment number: 26
Experiment number: 27
Experiment number: 28
Experiment number: 29
Experiment number: 30
Git Run TODO Problems Terminal Build Dependencies
Event Log
Tests passed: 6 (moments ago)
15:10 CRLF UTF-8 4 spaces Spring2022