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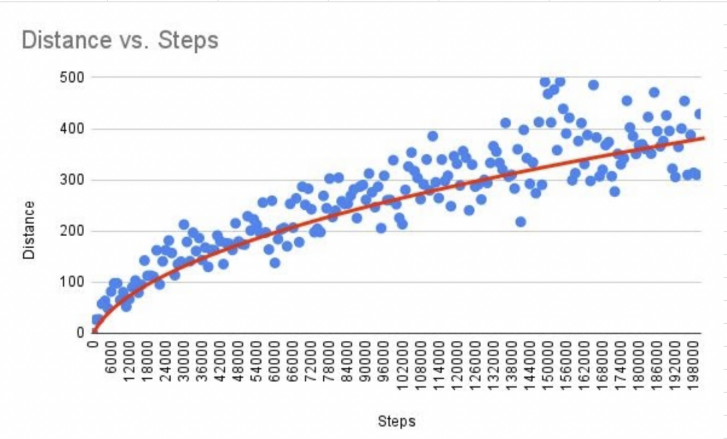
# Program Structures & Algorithms
# Fall 2021
# Assignment No. 1

- **Tasks performed in the assignment:**
  - Wrote the eucledean's distance formula in Java.
  - Passed all the test cases in the RandomWalkTest.java class.
  - Wrote another test case that ran the code for 200 distinct values for the number of steps (n) (from 0 to 200,000) and plotted that data on a graph to deduce the relationship.

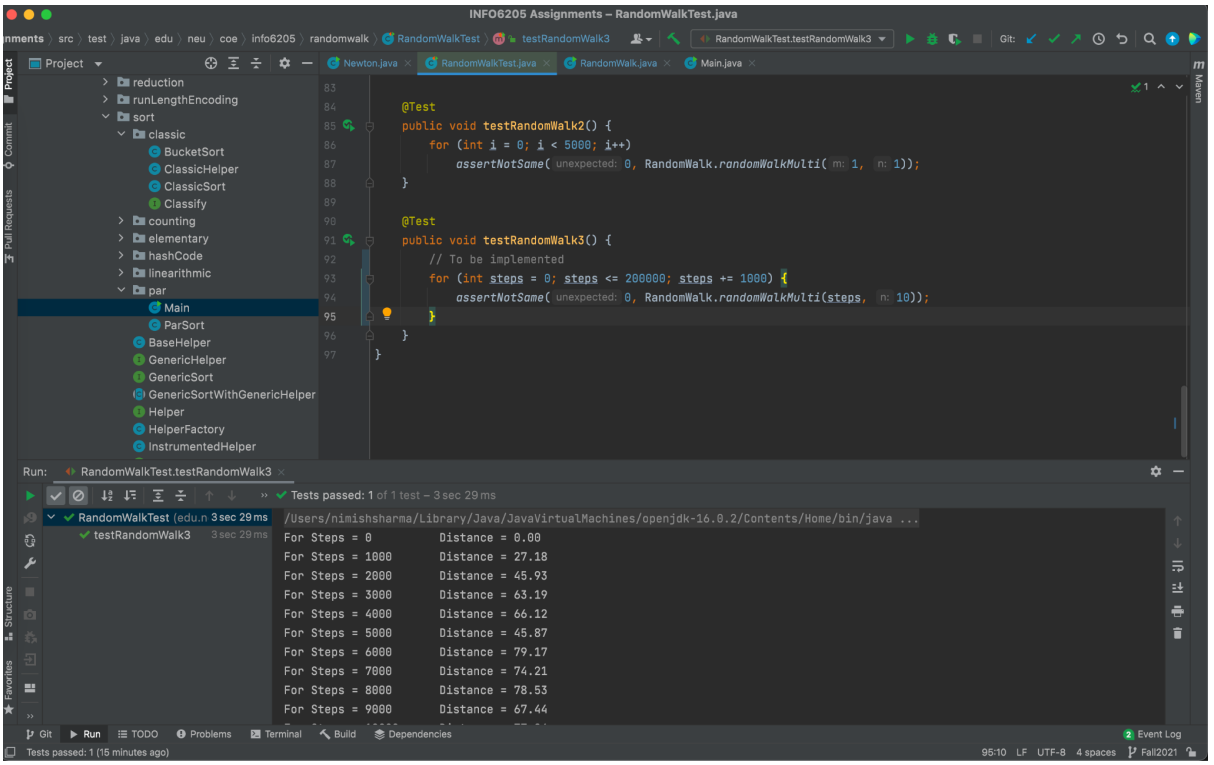
- **Relationship Conclusion:**
  The relations between 'd' and 'n' appears to be **d = √n**

- **Evidence to support conclusion:**
  - The red line curve is identical to a **y = √x** graph.

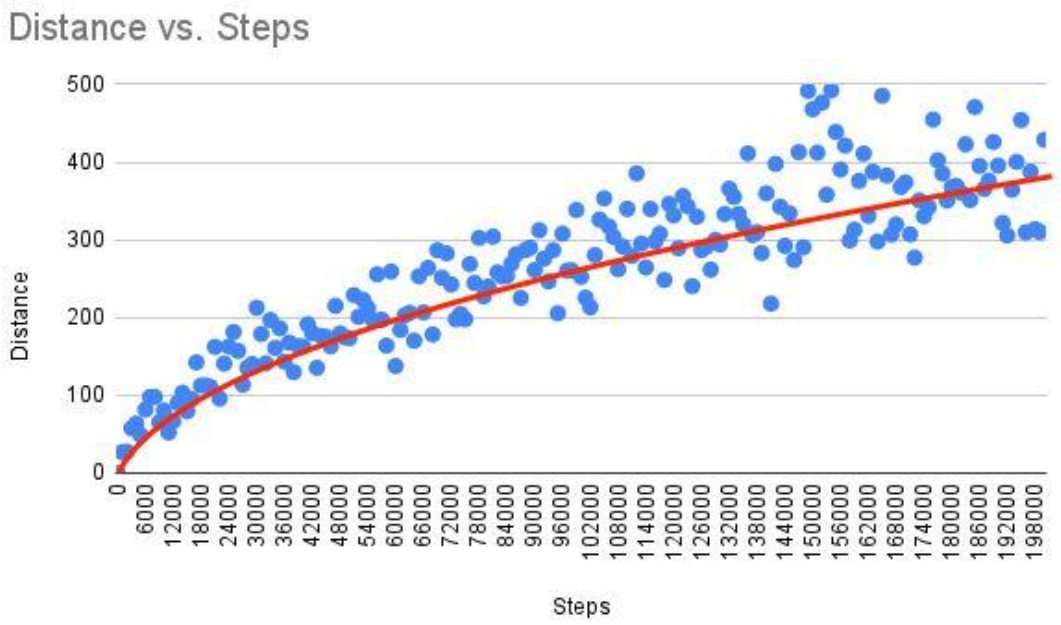
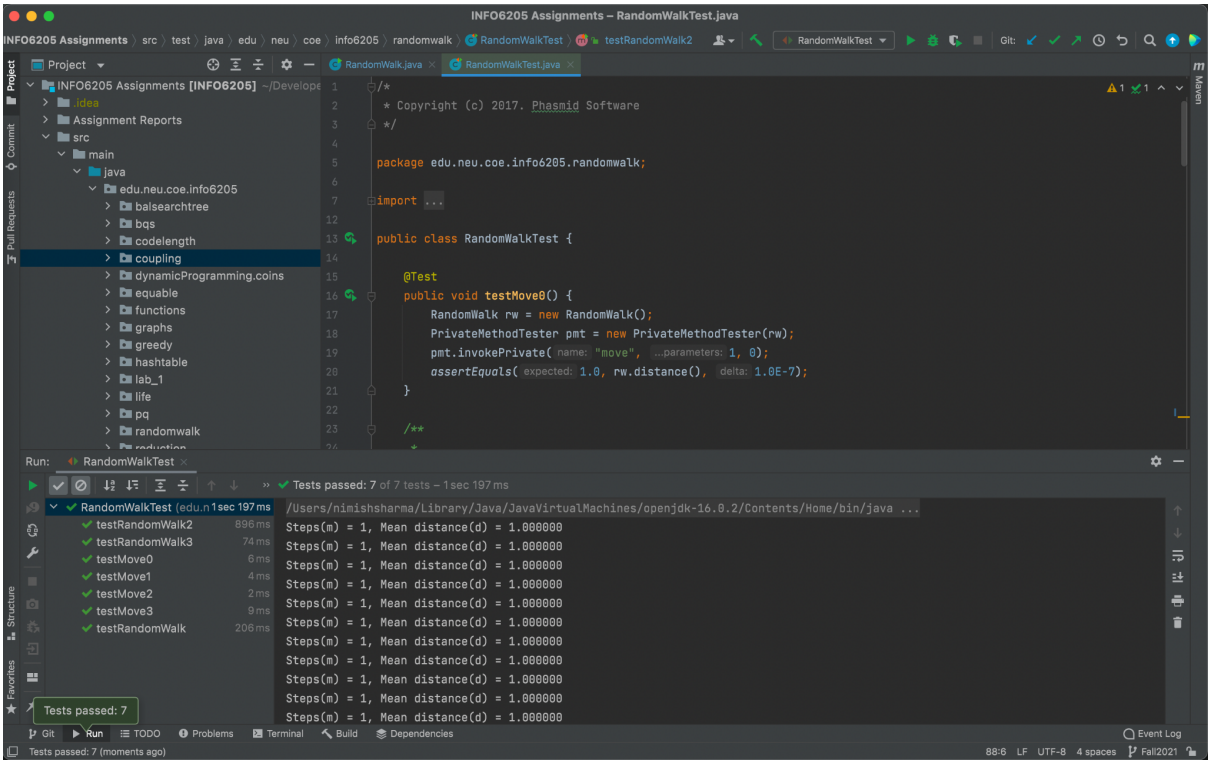
| Steps | Distance |
|---|---|
| 0 | 0 |
| 1000 | 26.78 |
| 2000 | 27.43 |
| 3000 | 57.55 |
| 4000 | 63.65 |
| 5000 | 48.55 |
| 6000 | 81.67 |
| 7000 | 97.79 |
| 8000 | 97.92 |
| 9000 | 65.26 |
| 10000 | 80.39 |
| 11000 | 52.21 |
| 12000 | 66.91 |
| 13000 | 90.23 |
| 14000 | 103.29 |
| 15000 | 79.55 |
| 16000 | 94.99 |
| 17000 | 142.37 |
| 18000 | 112.48 |
| 19000 | 112.75 |
| 20000 | 110.85 |
| 21000 | 162.27 |
| 22000 | 95.67 |
| 23000 | 140.7 |
| 24000 | 162.66 |
| 25000 | 181.47 |
| 26000 | 157.04 |



- **Output:**




- **Graphical Representation:**



- **Unit Test Result:**