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Program Structures & Algorithms

Fall 2021

Assignment No. 1

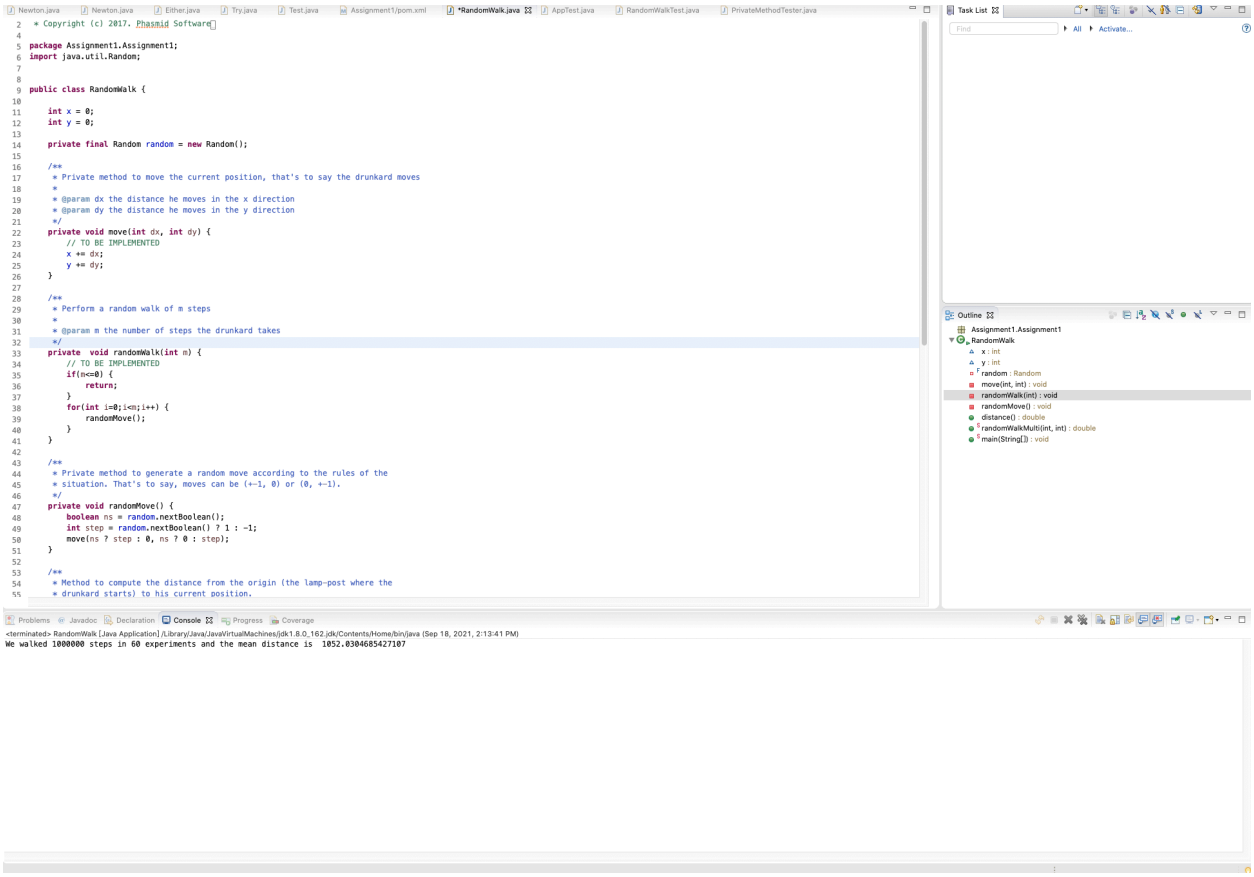
- **Task (List down the tasks performed in the Assignment)**

  Radom Walk

- **Relationship Conclusion:** $d = \sqrt{n}$

- **$Evidence to support the conclusion:**

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



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

$$d_1 = \sqrt{(x_1 - 0)^2 + (y_1 - 0)^2} d^2$$

$$= \frac{1}{p}\left(\sum_{i=1}^{p} (x_{i1} + x_{i2} + x_{i3} + \cdots + x_{in})^2 + (y_{i1} + y_{i2} + y_{i3} + \cdots + y_{in})^2\right)$$

$$d1 = \frac{1}{p}\sum_{i=1}^{p} ({x_{i1}}^2 + x_{i1}x_{i2} + x_{i1}x_{i3} + \cdots + {x_{i2}}^2 + x_{i1}x_{i2} + \cdots {x_{in}}^2 + {y_{i1}}^2 + y_{i1}y_{i2} + y_{i1}y_{i3} + \cdots + {y_{i2}}^2 + y_{i1}y_{i2} + \cdots {y_{in}}^2)$$

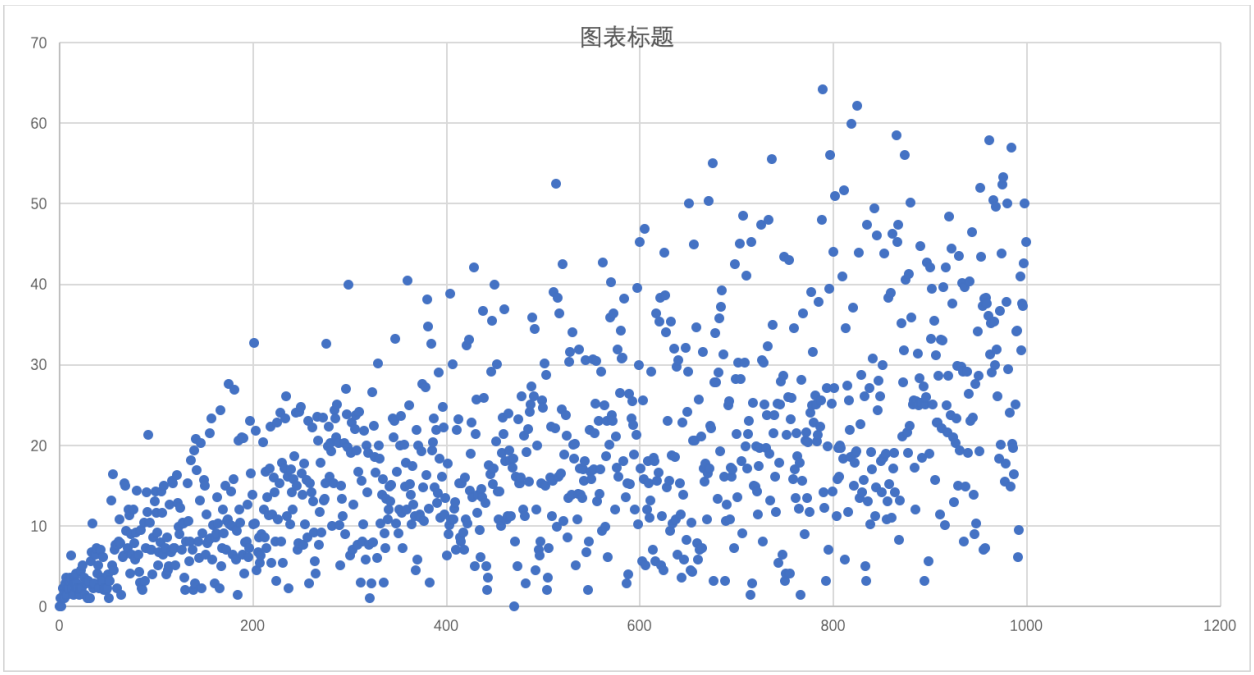
$$d^2 = \frac{1}{p}\sum_{i=1}^{p} ({x_{i1}}^2 + x_{i1}x_{i2} + x_{i1}x_{i3} + \cdots + {x_{i2}}^2 + x_{i1}x_{i2} + \cdots {x_{in}}^2 + {y_{i1}}^2 + y_{i1}y_{i2} + y_{i1}y_{i3} + \cdots + {y_{i2}}^2 + y_{i1}y_{i2} + \cdots {y_{in}}^2)$$

$$d^2 = \frac{1}{p}\sum_{i=1}^{p} ({x_{i1}}^2 + {y_{i1}}^2 + {x_{i2}}^2 + {y_{i2}}^2 + \cdots {x_{in}}^2 + {y_{in}}^2)$$

$$d^2 = \frac{1}{p}\sum_{i=1}^{p} (n)$$

$$d^2 = n$$

$$d = \sqrt{n}$$



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