

TROUBLE INVESTIGATION

- What is the average length of a move?
- Comparing different roll-again values: be cautious of random variation in the averages.
- Head-to-head game:

```
def game():
```

```
    # each player makes a move
```

```
    move A = _____
```

```
    move B = _____
```

```
    # while there is a tie, each player moves again
```

```
    while move A == move B:
```

```
        move A = _____
```

```
        move B = _____
```

```
    print(move A, move B)
```

```
    # return which player wins
```

```
    return _____
```

SIMPLE RANDOM WALKS

1. What proportion of time does it spend in each quadrant?
2. If you change the proportion of each turn, how does that change the overall direction?
3. How often does it backtrack across the previous segment?
4. How long, on average, does it take for the dot to go off the page?
5. What if we change the simulation so it doesn't stop at the edge, then how long will it take to fill up the grid?
6. What if we allow it to move in different angles, what shapes will emerge?
7. When the dot leaves the bounds, how big is the biggest enclosed shape?
8. When the dot leaves the bounds, how many little squares are there?
9. What amount of space is enclosed compared to unbounded?
10. Is there a max number of consecutive steps in the same direction?
11. How often does it visit a location that has been visited already? How often does it come back to the starting point?
12. On average, how far is the dot from the origin after n steps?

1-D Random Walk

