

2494 - COMPUTATIONAL THINKING & DATA SCIENCE

2021-22, Spring Semester

In-class Exercises

RANDOM WALK

1. Reconsider the drunkard problem. Suppose now that we have two other drunkards. The first one can move in the following directions: $(1,0)$, $(-1,0)$, $(0,1)$ and $(0,-2)$. The second one moves only for East and West: $(1,0)$ and $(-1,0)$.
Simulate several random walks for each one of the three drunkards and compare their mean distance between their last position and origin.
2. Simulate a random walk for each one of the three drunkards and plot their walks.

MONTE CARLO SIMULATION

3. Mary is participating in a game show contestant. She is about to win a car. All she has to do is choose the right door. She is standing in front of three large doors. Behind one of the doors is a new car; the other two doors conceal goats. Mary chooses a door. The host then reveals a goat behind one of the other two doors, and offers Mary the chance to switch to the other remaining closed door or to stay with her original choice. Before coming to the show, Mary decided that she would always switch, when asked if she wanted to. Write a simulation program to help Mary to determine if this is the best strategy.

