Simulation 3: diffusion

Description of activity:

1. All student stand in line(s) of tile.
2. Every time step (1-16) toss a coin and move one tile left (head) or one tile right (tail).
3. Record your tile position (number) at each time step.

Homework part a (once you have the worksheet with all the data):

1. Plot the student concentration as function of time for t=0,4,8,12,16.
2. How did the mean student position change as function of time?
3. How did the standard deviation around the mean change as function of time? What units does it have?
4. Assuming a time-step of 20sec and a step-length of 25cm, estimate from dimensional analysis the diffusion coefficient of the students in the corridor ([D]=m^2/s).

Simulation 4: biased diffusion

Description of activity:

1. All student stand in line(s) of tile.

2. Every time step (1-16) toss a coin and move left one tile (head) or right TWO tiles (tail).

3. Record your tile position (number) at each time step.

Homework part b (once you have the worksheet with all the data):

1. Plot the student concentration as function of time for t=0,4,8,12,16.

2. How did the mean position changed as function of time?

3. How did the standard deviation around the mean change as function of time? What units does it have?

4. Assuming a time-step of 20sec and a step-length of 25cm, estimate from dimensional analysis the diffusion coefficient of the students in the corridor ([D]=m^2/s). Using part 1, what is the mean drift speed of the mean position (the rate by which the position of the mean drifts [v]=m/s)?