

# Modeling the Zombie Apocalypse

PEARC17 Modeling Day Group 6  
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# Safe Zone

Humans have established safe zone

Top right corner

Humans stop in this, zombies turn around

```
if objects[i][4] == 0:
    if np.random.rand() > 0.7:
        #infrequently drop a zombie in the area below the safe zone
        if np.random.rand() > 0.5:
            objects[i][0] = np.random.uniform(.7, 1)
            objects[i][1] = np.random.uniform(0, .7)
        #infrequently drop a zombie in the area to the left of the safe zone
        else:
            objects[i][0] = np.random.uniform(0, .7)
            objects[i][1] = np.random.uniform(.7, 1)
    else:
        objects[i][0] = np.random.uniform(0, 0.7)
        objects[i][1] = np.random.uniform(0, 0.7)
else:
    objects[i][0] = np.random.rand()
    objects[i][1] = np.random.rand()
```

# Random Movement

Zombies and humans have chance of changing direction

Zombies more likely to alter course

Humans have higher top speed (abs(.5) vs abs(.25))

```
#humans have 1 in 5 chance of changing velocity
if objects[j][4] == 1 and np.random.rand() < .2:
    objects[j][2] = 0.5 - np.random.uniform(0,1)
    objects[j][3] = 0.5 - np.random.uniform(0,1)
#zombies have 1 in 2 chance of changing velocity
elif objects[j][4] == 0 and np.random.rand() < .5:
    objects[j][2] = 0.25 - np.random.uniform(0, 0.5)
    objects[j][3] = 0.25 - np.random.uniform(0, 0.5)
```



# Running the Simulation

80 humans vs. 20 zombies

Zombies and humans move randomly

Zombies move slower

Top right corner is the safe zone

Zombies cluster together

