

Homework 3
Data Science
PCS – UConn, 2022
Due Date: July 14, 2022
(by 8pm, via HuskyCT)

1. We have twenty-five students and three professors in our class. Suppose that each year has 365 days. Use simulation to find the probability of the following event.
 - *Exactly two* out of twenty-seven people have a common birthday and other people have different birthdays.
2. A King offers a death row prisoner a chance to live by playing a simple game. He gives 50 black marbles, 50 white marbles, and 2 empty bowls to the prisoner. The King asks the prisoner to divide these 100 marbles into these 2 bowls in any way as long as all the marbles are used. He will then blindfold the prisoner and mix the bowls around. After that, the prisoner can choose one bowl and pick one marble randomly. If the marble is white the prisoner will live, but if the marble is black the prisoner will die. Use simulation to find the probability of living for the following ways of dividing.
 - a. Put the 50 white balls in one bowl and the 50 black balls in another bowl.
 - b. Put one white ball in one bowl and the other 99 bowl balls in another bowl.