ENG-101 Intro Computing Engineers

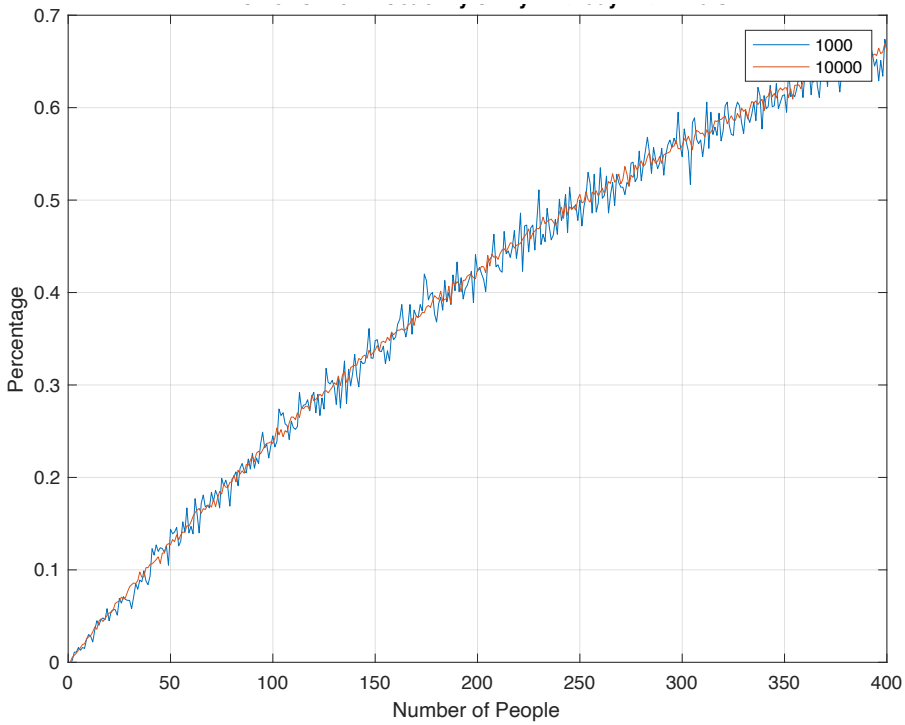
Due: 17 November 2021 at 6:00PM – start of class.

Question 1 (25 Points)

Write a MATLAB function $[y] = birthMatch(N)$ to simulate the experiment of walking into a room of N people and determining if there is anyone in the room that shares your birthday. Use MATLAB's random number generator to generate a vector of length N that ranges between 1 and 365. Do not model the leap-year case. The output variable y is a logical true/false result.

In a well-documented MATLAB script, hmwk9Q1.m simulate the experiment of walking into a room with N people using the function $birthMatch(N)$. The function $birthMatch(N)$ depicts the experiment of determining if any of the N people match your birthday.

The experiment is repeated 1000 and 10000 trials respectively for as the number of people is adjusted between 1 and 400 respectively. In this problem, you may consider using two floor-loops nested. The outer loop varies the number of people, while the inner loop repeats the trials from 1 to 1000. You can repeat two nested loops as the inner loop repeats from 1 to 10000. Submit the figure as hmwk9Q1.fig.



Grading: 8 points for the nested for-loops to produce 1000 trials over 400 people. 8 points for the nested for-loops to produce 10000 trials over 400 people. Both submitted within the file hmwk9Q1.pdf. 4 points for the correct figure hmwk9Q1.pdf. 5 points for the function *birthMatch()*.

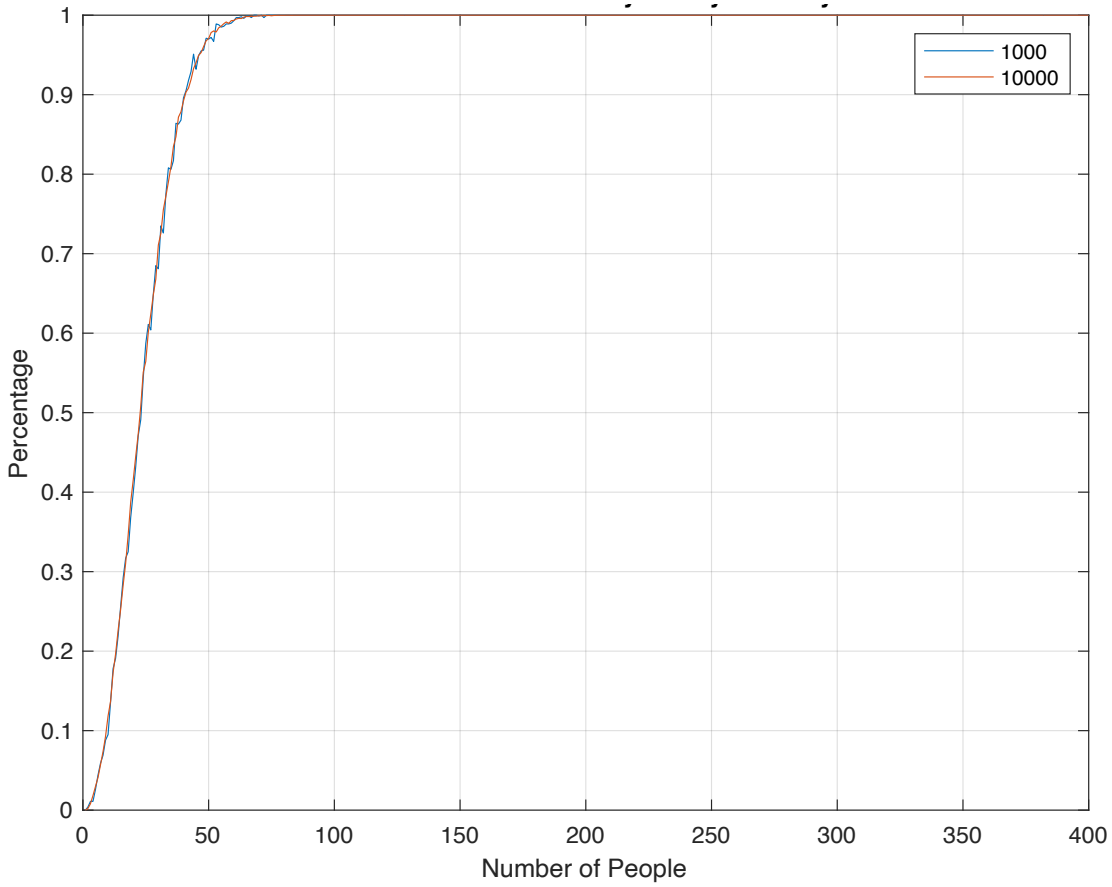
Question 2 (25 Points)

Write a MATLAB function $[y] = anybirthMatch(N)$ to simulate the experiment of walking into a room of N people and determining if there is anyone in the room shares a birthday – excluding yourself. Use MATLAB's random number

generator to generate a vector of length N that ranges between 1 and 365. Do not model the leap-year case. The output variable y is a logical true/false result.

In a well-documented MATLAB script, hmwk9Q2.m simulate the experiment of walking into a room with N people using the function $anybirthMatch(N)$ developed. The function $anybirthMatch(N)$ depicts the experiment of determining if any of the N people have the same birthday.

The experiment is repeated 1000 and 10000 trials respectively for as the number of people is adjusted between 1 and 400 respectively. Submit the figure as hmwk9Q2.fig. If you designed your code hmwk9Q1.m with extensibility in mind, then the former code can be reused in the problem by simply replacing $birthMatch(N)$ with $anybirthMatch(N)$.



Grading: 8 points for the nested for-loops to produce 1000 trials over 400 people. 8 points for the nested for-loops to produce 10000 trials over 400 people. Both submitted within the file hmwk9Q2.pdf. 4 points for the correct figure hmwk9Q2.pdf. 5 points for anybirthMatch.m with comments.