

python assignment 1st semester

1. Consider a 3x3 square in which you place rings. You have 27 rings, 9 of each size (small, medium, large). A triplet that terminates the game can be horizontal, vertical, or diagonal. The triplet consists of rings of the same size or from small to large. Since you have rings, a ring can be placed in any square if it does not already have a ring of the same size. Write a program that randomly plays the game 100 times and returns the average number of steps to finish the game.

6. Let's consider a chessboard on which we place randomly a white rook and officer, and a black queen. Each player gets two points per round depending on whether they capture a piece of the opponent. Thus, the white player can get 2 points if the rook and the officer capture the queen, and the same applies to the black player's queen. If only one of the pieces captures the queen, then the player gets one point. Similarly, the black player gets two points if their queen can capture both white pieces or one point if it can capture only one. After 100 games, display the scores of both players.

10. You are given a text file containing only ASCII characters. Initially, represent each character in binary of length 7. Keep only the first two and last two bits of each binary representation. Split the resulting sequence into 16-bit numbers and display the following statistics:

- a) What percentage of the numbers are even?
- b) What percentage of the numbers are exactly divisible by 3?
- c) What percentage of the numbers are exactly divisible by 5?
- d) What percentage of the numbers are exactly divisible by 7?

13. The service <https://www.cloudflare.com/en-gb/leagueofentropy/> provides random numbers. Initially, use the address <https://drand.cloudflare.com/public/latest> to retrieve the latest randomness, which you will divide into pairs of hexadecimal characters, each of which you will count as an integer and take modulo 80. Keep these 32 unique numbers and calculate how many of them would have been inherited in the last draw of the KINO lottery, which you can find here <https://api.opap.gr/draws/v3.0/1100/last-result-and-active>.