

# CSC 226 Summer 2023 Lab 2: Probability stuff!

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May 17, 2023

## 1 Introduction

In this lab session, we briefly explain

- Sample Space, Event, Probability
- Random Variable, Probability Distribution, Expected Value
- Conditional Probability, Independence

And then you will have time to work on the following 3 questions.

Remember that you should show your work in order to get the mark for the lab.

Please don't hesitate to ask questions!

**Question 1.** Suppose you pick a number from the set  $S = \{10, 11, 12, \dots, 99\}$  uniformly at random. What is the probability that digits sum up to 7?

**Question 2.** Denote  $X_1$  and  $X_2$  to be two fair dice.

- Calculate the value of  $A = \mathbb{E}[\max\{X_1, X_2\}]$
- Calculate the value of  $B = \max\{\mathbb{E}[X_1], \mathbb{E}[X_2]\}$
- Is  $A$  equal to  $B$ ?

**Question 3.** A fair dice is rolled, find the probability that the number is five given that it is odd.

The next question is only for fun. Feel free to think about it. It's not going to be in an exam or anything.

**Question for fun.** A monkey is pecking at a typewriter, producing each character independently and uniformly at random from the 26 letters of the English alphabet. Is it more likely to type the word *EARTH* or *HEART* first? ("Word" here means "contiguous substring of its typing output".) from here