Assignment_02

April 14, 2021

0.1 Assignment 02 - Statistics I (due by 2nd of December)

The assignments for this exercise were scattered around the lecture today. You can either answer them on a piece of paper, scan/photograph your notes, or solve them in Latex as a PDF document and upload them into the `Assignment_02` folder, hit `submit` on the `Assignments` tab on top, or solve them here via Latex.

You'll find a PDF with the summarized homework in the `Assignment_02` folder in your home on the Jupyterhub.

To change a cell, simply double-click and type your solution like you would in a Latex-document. Almost everything works like you know it, raw text, `\begin{..}` environments, and other features that Latex offers. Don't provide a \begin{document}'

0.2 Set Theory (2 points)

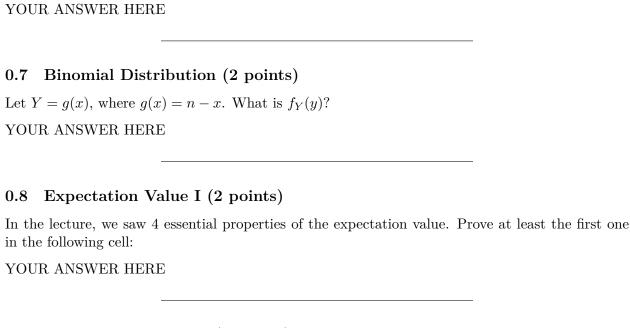We talked about a few properties of events A, B, C from a sample space S, prove them in the following cell:

YOUR ANSWER HERE

0.3 Probability Functions (2 points)

Show that for any $A \subset S$: $P(A) = \sum_i p_i$

YOUR ANSWER HERE

0.4 Legitimate Probability Functions (2 points)

YOUR ANSWER HERE

0.5 Coin Toss

Tossing three coins, show that the occurance of *head* on any toss has no effect on any other tosses.

YOUR ANSWER HERE

0.6 Continuous Distribution Functions (2 points)

YOUR ANSWER HERE

0.7 Binomial Distribution (2 points)

Let $Y = g(x)$, where $g(x) = n - x$. What is $f_Y(y)$?

YOUR ANSWER HERE

0.8 Expectation Value I (2 points)

In the lecture, we saw 4 essential properties of the expectation value. Prove at least the first one in the following cell:

YOUR ANSWER HERE

0.9 Expectation Value II (2 points)

In the lecture, we mentioned the distance between a random variable x and a constant b as $(x-b)^2$. Show that its expectation value is $E(x-b)^2 = E(x - E(x))^2 + (E(x) - b)^2$:

YOUR ANSWER HERE