

MARCUS KRACHT

ASSIGNMENTS, PART 1.

You may email me the graphics instead of printing it out. Similarly for the answers to the assignments. Notice that in case you submit nonelectronically, you do *not* have to type them, I accept handwriting as well! When I ask you to use R, the answer will always at least consist in telling me what you told R to do, ie I want to see the code that you issued.

Ex 1.1 There is a lottery, where you have to guess 6 numbers between 1 and 49. What is the chance of getting 0, 1, 2, \dots 6 numbers right? How much more should one award to a person that gets 5 numbers right than to someone who gets 3 numbers right for this to be a fair reward scheme? Use R to generate a few sample bets.

Ex 1.2 Write a program that plots the function $y = 20 - x^2$ and generate the output between 0 and 5 in a file. Overlay the following data points onto the graphics: $(0, 19.6)$, $(2, 15)$, $(3.5, 13)$, $(4, 10)$, $(5, .4)$.

Ex 1.3 Draw the function $\binom{20}{i}$ using triangles as data points. Calculate the mean of this function and draw the mean as a line into the graphics. Can you give a short expression that calculates the mean other than adding up all the numbers?

Ex 1.4 Find a simple expression for $\binom{n}{k} + 2\binom{n}{k+1} + \binom{n}{k+2}$. *Hint.* Generate a few of these numbers and see if you can find a nice expression for them.