Coconuts and Islanders

A) There are $N = 300$ inhabitants (natives, castaways, etc.) on the island, initially each receives $C = 15$ coconuts. The inhabitants play a game of paper-scissors-stone, the loser in a pair passes 1 coconut to the other person (if they have one). Pairs are chosen at random.
Perform a simulation of $T = 100000$ games and plot a histogram (probability density) as a function of the number of coconuts owned. Mark on the histogram the function (approximation of the distribution for $N, C >> 1$)
$p(x) = 1/(1+C) * e^{-x/kT}$, where $kT = C + 0.5$.

B) Plot the number of people with zero coconuts as a function of the number of games (e.g., every 1000 games). Plot with a dashed line the value of $p(0) * N$.

All graphs should have a title, axis description, grid and be saved to a file.

An example solution to a similar problem can be found in *"Coconuts and Islanders: A Statistics-First Guide to the Boltzmann Distribution"* by Brian Zhang;
https://doi.org/10.48550/arXiv.1904.04669
For extra hints see Figure 1.
Example solution graphs are shown in Figure 2.

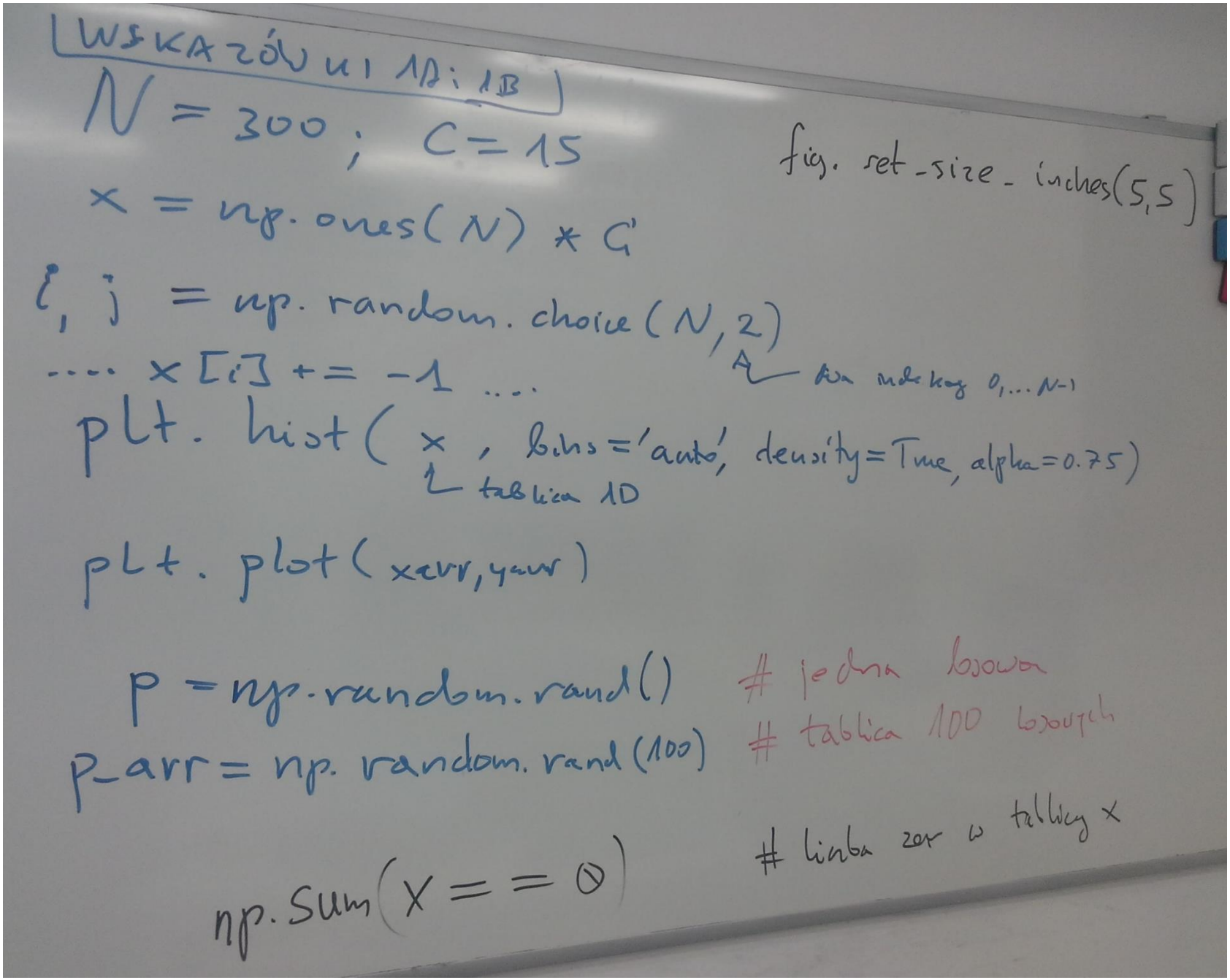

Figure 1. Extra Hints

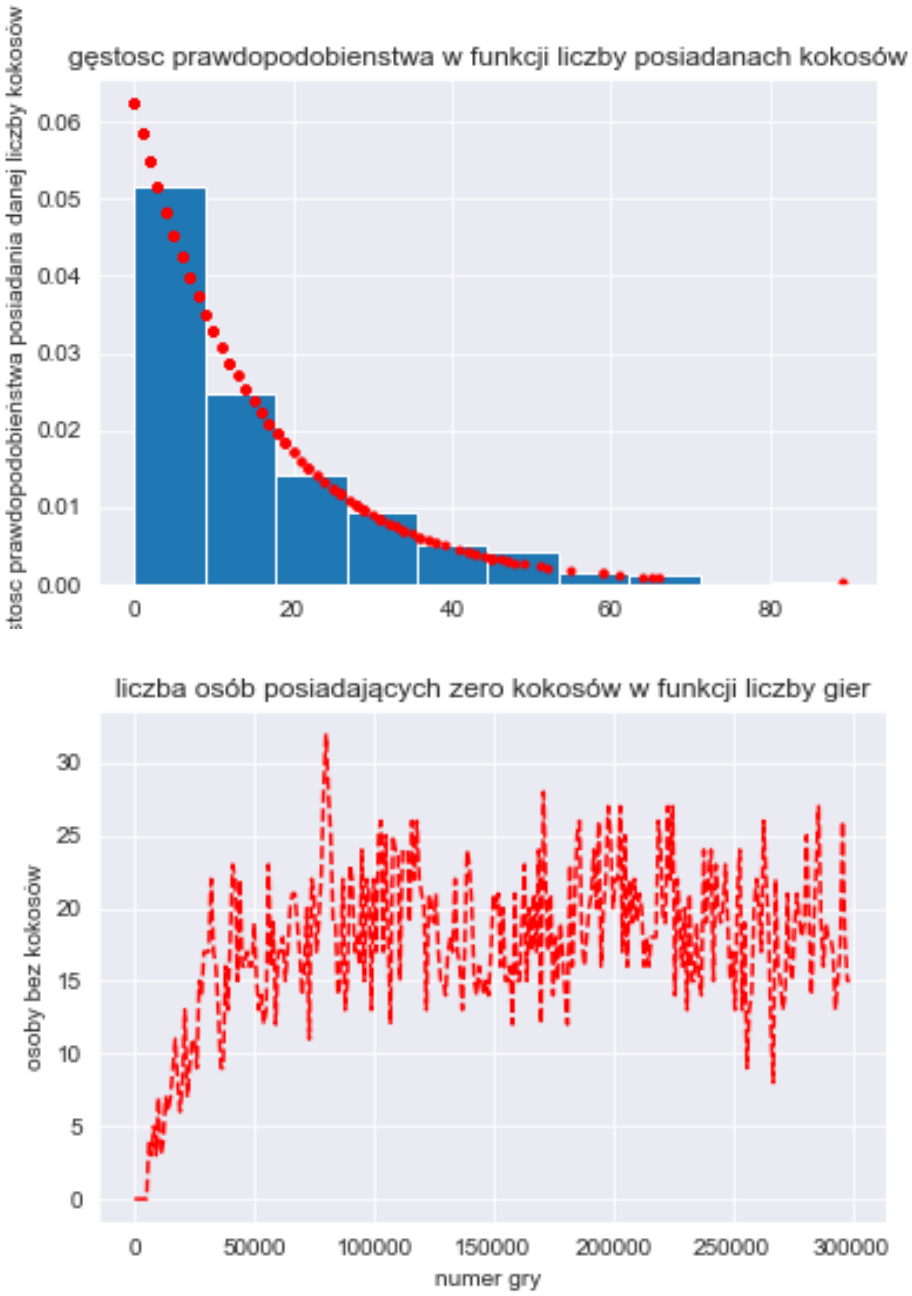

Figure 2. Example solution graphs

Additional materials on Boltzmann distribution:

- Ideologically the simplest illustration of Boltzman decomposition (according to S.C. Zhang https://arxiv.org/abs/1904.04669)
- Physical model for the energy exchange between the particles of a gas we obtain, when we divide (in each collision) the sum of the possessed energy according to a random ratio
- numerous econo-physical models of wealth accumulation in the population: attempts to reconstruct the power-law distributions "Statistical mechanics, of money" https://arxiv.org/abs/cond-mat/0001432, https://arxiv.org/abs/cond-mat/0004256