

### Homework 7: Program I.2

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The following three histograms show the distribution of the number of balls in bin A after  $10^3, 10^4, 10^5$  swaps. In all cases, bin A starts out with 1000 balls, and 1000 iterations of each simulation are done, resulting in one data point per simulation.

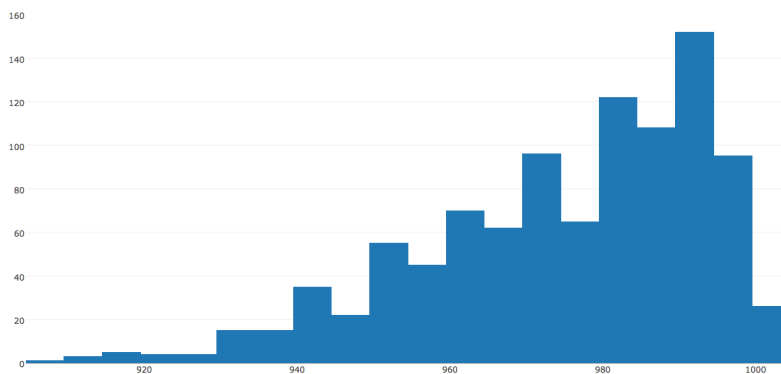


Figure 1: The distribution of the number of balls in bin A after  $10^3$  swaps.

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 Ehrenfest works by picking a ball from the 1000 at random and causing it to change chamber rather than flipping a coin and having a random ball from A go to B for heads and B to A for tails

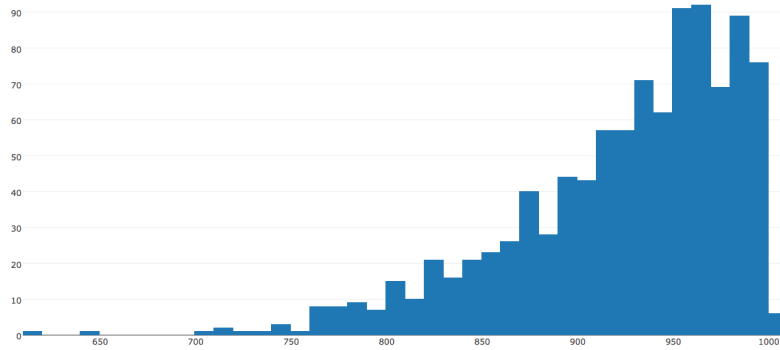


Figure 2: The distribution of the number of balls in bin  $A$  after  $10^4$  swaps.

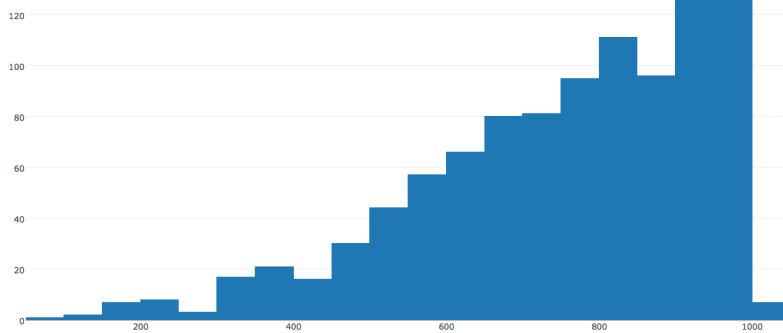


Figure 3: The distribution of the number of balls in bin  $A$  after  $10^5$  swaps.