Notes for Final Exam P5

There exists one wrong algorithm, n numbers are splitted into two parts according to their value, and if the result of coin flipping is head, choose the smaller part, otherwise choose the bigger part. The algorithm is repeated until the part chosen has only one number.

Consider n = 3, and part 1 is 1, part 2 is 2,3. In this case, the probability of choosing 1 is 1/2, while choosing 2 is 1/4, the same with choosing 3. The algorithm only works for n = 2^k.

One possible algorithm is that you can flip the coin $\lceil \log(n) \rceil$ times, if the result m > n, just repeat the previous process again. The probability of needing another flipping can be proved to be smalller than 1/2, and thus the total number of coin flips we use is $O(\log(n))$. However, if you do not consider the case m > n, then the approach is not correct, and only works for n = 2^k.

exam

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followup discussions *for lingering questions and comments*