

Homework of Week 2

Deadline: 9:00am, October 7 (Thursday), 2021

1. Prove that any geometric random variable is memoryless.
2. Prove that any memoryless discrete random variable is geometric.
3. Arbitrarily fix two discrete random variables X, Y and two function f, g . Prove that if X and Y are independent, then $f(X)$ and $g(Y)$ are also independent.
4. Do Bernoulli experiment for 20 trials, using a new 1-Yuan coin. Record the result in a string $s_1 s_2, \dots, s_{20}$, where s_i is 1 if the i^{th} trial gets Head, and otherwise is 0.