

HW of Week 1: Submission must be no later than 9:00am, October 27<sup>th</sup> (Sunday), 2019.

1. Prove that any memoryless distribution on positive integers is a geometric distribution.
2. Assume that on an island, each couple give birth to babies until they have a female baby and a male baby. Suppose that a baby will be male or female with probability 0.5. On average how many male/female babies does a couple have?
3. Do Bernoulli experiment for 20 trials, using a new 1-Yuan coin. Write down the results in a string  $s_1s_2\dots s_i\dots s_{20}$ , where  $s_i$  is 1 if the  $i^{\text{th}}$  trial gets Head, and otherwise is 0.