Michele_Lotto_Exercises

Michele Lotto

2022-11-26

Michele Lotto Exercises

4) 3.21
5) 5.22

List 4 - Exercise 3.21

If A flips $n+1$ and B flips n fair coins, show that the probability that A gets more heads than B is $\frac{1}{2}$.

Hint: Condition on which player has more heads after each has flipped n coins. (There are three possibilities.)

Solution

List 8 - Exercise 5.22

Let U be a uniform $(0,1)$ random variable, and let $a < b$ be constants.

(a) Show that if $b > 0$, then bU is uniformly distributed on $(0, b)$, and if $b < 0$, then bU is uniformly distributed on $(b, 0)$.

(b) Show that $a + U$ is uniformly distributed on $(a, 1 + a)$.

(c) What function of U is uniformly distributed on (a, b)?

(d) Show that $min(U, 1 - U)$ is a uniform $(0, 1/2)$ random variable.

(e) Show that $max(U, 1 - U)$ is a uniform $(1/2, 1)$ random variable.

Solution