6. Exercise: Random variables versus numbers

Exercises due Feb 28, 2020 05:29 IST *Completed*

Exercise: Random variables versus numbers

2/2 points (graded)

Let X be a random variable that takes integer values, with PMF $p_X(x)$. Let Y be another integer-valued random variable and let y be a number.

a) Is $p_X(y)$ a random variable or a number?

Number ✔ **Answer:** Number

b) Is $p_X(Y)$ a random variable or a number?

Random variable ✔ **Answer:** Random variable

Solution:

a) Recall that $p_X(\cdot)$ is a function that maps real numbers to real numbers. So, when we give it a numerical argument, y, we obtain a number.

b) In this case, we are dealing with a function, the function being $p_X(\cdot)$, of a random variable Y. And a function of a random variable is a random variable. Intuitively, the “random" value of $p_X(Y)$ is generated as follows: we observe the realized value y of the random variable Y, and then look up the numerical value $p_X(y)$.

Submit You have used 1 of 1 attempt

Answers are displayed within the problem

Discussion

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- Meaning of "." in $pX(\cdot)$? — 7
  Hi! What is the meaning of the "." in the solution: $pX(\cdot)$ Thanks!
- can a number be a random variable? — 2
  If we assume a number can be a random variable always taking on the same value, would a) be random ...
- Having trouble understanding a) — 10
  My understanding is that, $pX(y)$ means the probability of the Random Variable X is equal to a number y. ...
- Hint: its easy to misinterpret 'y' , its not related to 'Y' — 4
  Ok I got the first one wrong because I considered y to be a possible value of Y , late night study to be bla...
- Interpretation of (b) — 4
- PMF — 2
  Hi, The answer to the solution of Exercise (b) mentions that "Intuitively, the “random" value of pX(Y) is ge...
- Exam 1 — 2
  Did you release the first exam?
- Meaning behind question b) — 7 new — 18