Exercise: Stick-breaking

(3/3 points)

Consider the same stick-breaking problem as in the previous clip, and let $\ell = 1$. Recall that $f_{X,Y}(x,y) = 1/x$ when $0 \le y \le x \le 1$.

a) Conditioned on $Y = 2/3$, the conditional PDF of X is nonzero when $a \le x \le b$. Find a and b.

$a =$ 2/3 ✔ **Answer:** 0.66667

$b =$ 1 ✔ **Answer:** 1

b) On the range found in part (a), the conditional PDF $f_{X|Y}(x \mid 2/3)$ is of the form cx^d for some constants c and d. Find d.

$d =$ -1 ✔ **Answer:** -1

Answer:
a) Since the joint PDF is nonzero only for $0 \le y \le x \le 1$, it follows that given that $Y = 2/3$, X ranges on the interval $[2/3, 1]$.

b) As a function of x, the conditional PDF has the same functional form (within a normalizing constant) as the joint PDF, and so it is of the form c/x, from which we conclude that $d = -1$.

You have used 1 of 2 submissions

Lec. 10: Conditioning on a random variable; Independence; Bayes' rule
Exercises 10 due Mar 16, 2016 at 23:59 UT

Standard normal table

Solved problems

Problem Set 5
Problem Set 5 due Mar 16, 2016 at 23:59 UT

Unit summary