

Quals Question

You are drawing variables U_0, U_1, \dots iid $\sim U[0, 1]$.

- (a) T_1 is the number of attempts until you surpass your first draw (i.e., break your first record):

$$T_1 = \min\{n \geq 1 : U_n > U_0\}$$

What is the PMF of T_1 ?

- (b) What is the PDF of U_{T_1} ?

- (c) T_2 is the number of attempts it takes you to set your next record:

$$T_2 = \min\{n \geq 1 : U_{T_1+n} > U_{T_1}\}$$

What is the PMF of T_2 (bring to as explicit a form as you can)?

- (d) Repeat parts (a) and (c) for U_0, U_1, \dots iid $\sim N(0, 1)$.