

How many times do you need to roll a discrete random variable to get your statistic

Fernando P. Rivera

Abstract—This paper proposes a method to get the method to know how many times do you need to roll a random variable to get your statistic

Index Terms—Joint Probability

I. INTRODUCTION

This

II. THEORETICAL FOUNDATION

A. Probability of to get a value x_m in the k – th try

Given a discrete random variable X with N different possible values, $X \in \{x_0, x_1, \dots, x_{N-1}\}$, where $Pr(X = x_m) = p_m \forall m \in \mathbb{Z}^+ | 0 \leq m < N$. We define as T the discrete random variable that represent the probability of to get a value x_m until the k – th roll of a random variable X .

$$Pr(T = k) = (1 - p_m)^{k-1} p_m \quad (1)$$

B. Probability of to get a value x_m in any of the first k – th tries

Using the data of section II-A

$$Pr(S = k) = \sum_{l=1}^k Pr(T = l) = \sum_{l=1}^k (1 - p_m)^{l-1} p_m \quad (2)$$

III. FINAL REMARKS AND CONCLUSIONS

In this letter, we considered

ACKNOWLEDGMENT

IV. APPENDIX

REFERENCES

- [1] Pujaico, F.; Portugheis, J., “Optimal Rate for Joint Source-Channel Coding of Correlated Sources Over Orthogonal Channels,” Communications Letters, 2014.