# Stats 314, Data Analysis #1

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# Part I

### a

Uniform distribution, because it is continuous, each time has an equal probability, and distribution. This is a property unique to uniform distributions.

### b

Poisson distribution, because we are given an average rate over a discrete random variable.

### c

Exponentional distribution, we're given a continuous random variable with an average rate (8), while also being given a skew indicating an exponential distribution.

### d

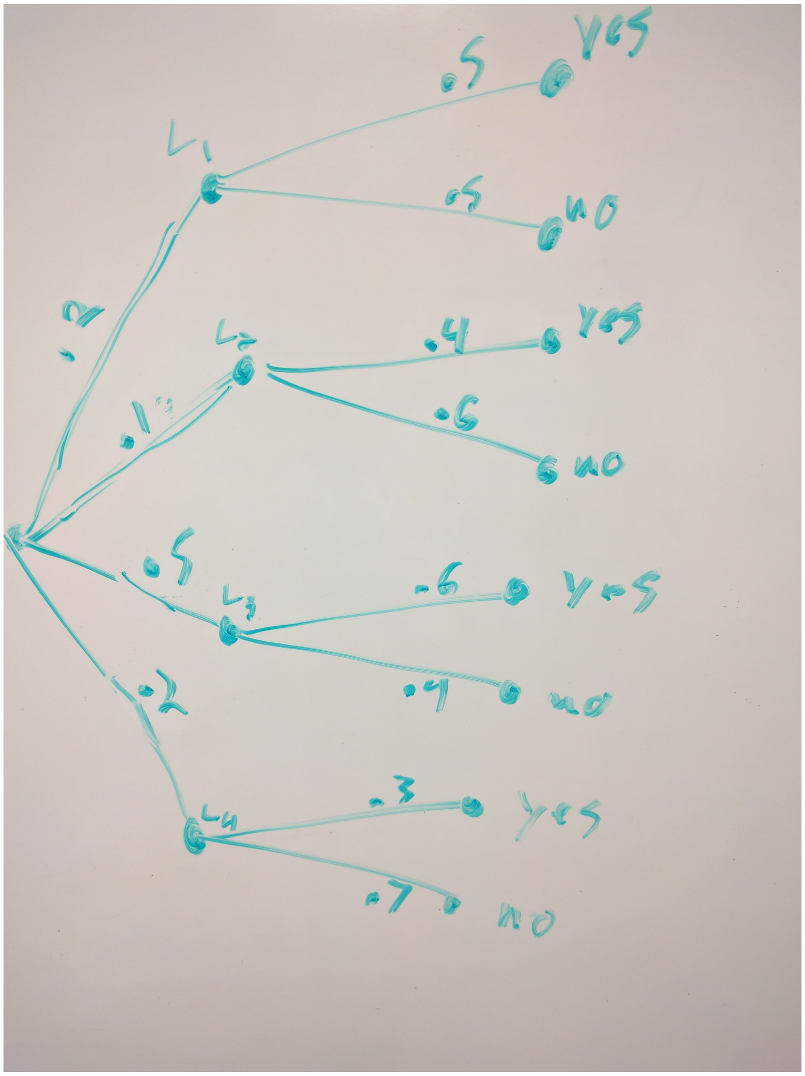
Binomial distribution, as we are given a set of independent events, two possible outcomes, a probability of failure (.25) and through that success (.75).

### e

Normal distribution, as we are given an average value (6), the standard deviation from that value (.6), and are told that values farther from the median value are less likely. This describes a typical bell curve.

## Part II

### a




### b

To get the probability of a ticket, we have to use the law of total probability to calculate the combined probability of getting a ticket in each area given that they are in operation.
L1: $.2 * .5 = .1$
L2: $.1 * .4 = .04$
L3: $.5 * .6 = .3$
L4: $.2 * .3 = .06$

P(ticket)$=.1 + .04 + .3 + .06 = .5$

## Part III

### a

HHHH
HHHT
HHTH
HTHH

THHH
HHTT
HTHT
THHT
THTH
HTTH
TTHH
HTTT
THTT
TTHT
TTTH
TTTT

## b

$4/16 = .25$

## c

$5/16 = .3125$

## d

Binomial distribution, because we have a set of independent events with a discrete random variable, and we're interested in the success rate for specific outcomes.

## e

To get the probability of $X = 3$, we have to take:
$P(X = 3) = 4/16 = .25$

## f

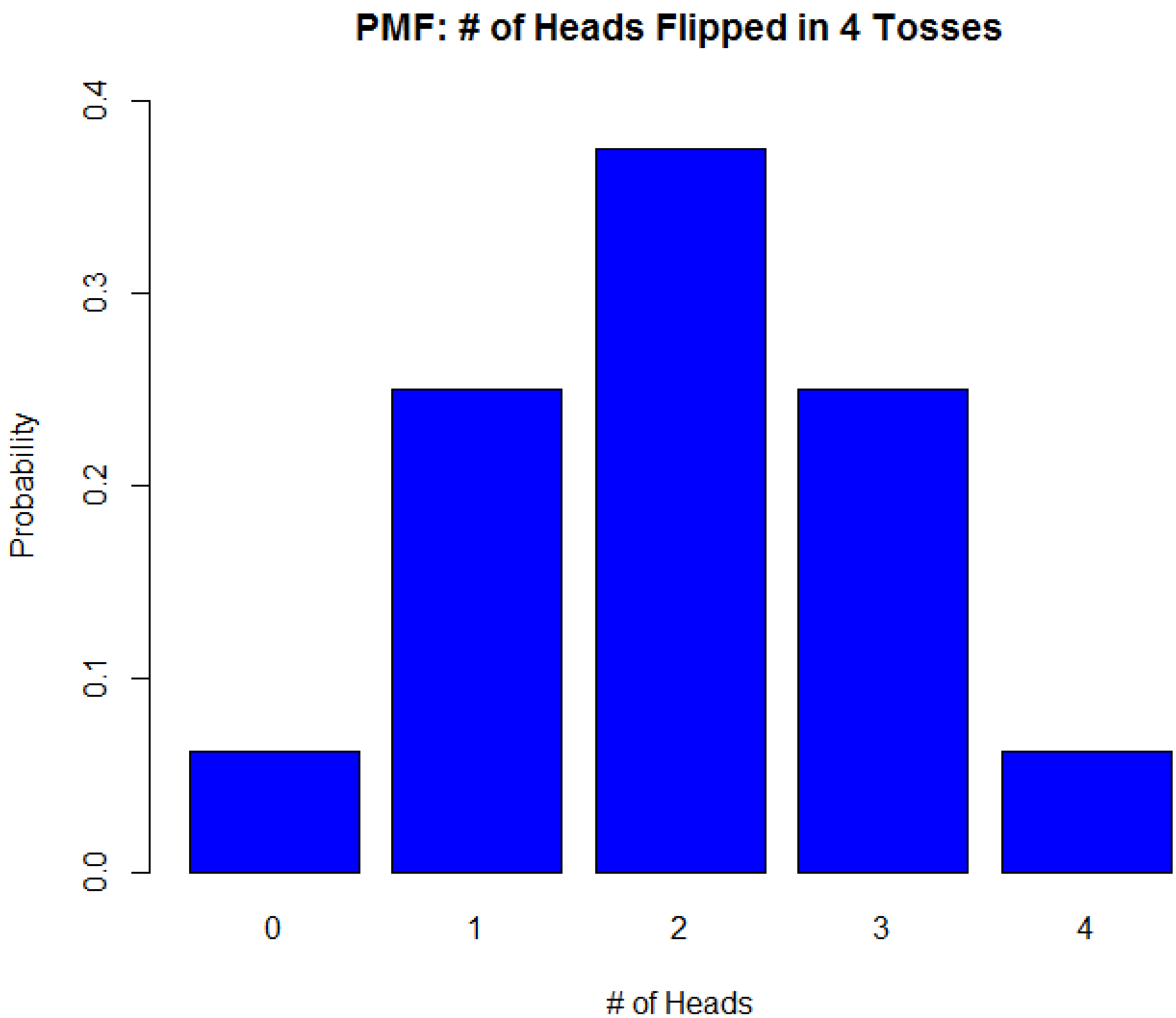
To get the probability of $X >= 3$, we have to take:
$1 - P(X >= 3) = 1 - (P(0) + P(1) + P(2)) = 1 - .6875 = .3125$

## g

They sure are!

### h

The most likely number is 2. The likelihood is .375




### i

$E(X) = np$, where $n$ is the number of coin tosses, and $p$ is the probability of success.
$E(X) = 4 * .5 = 2$, which is our most likely number of heads/tails.

# Part IV

# Part V