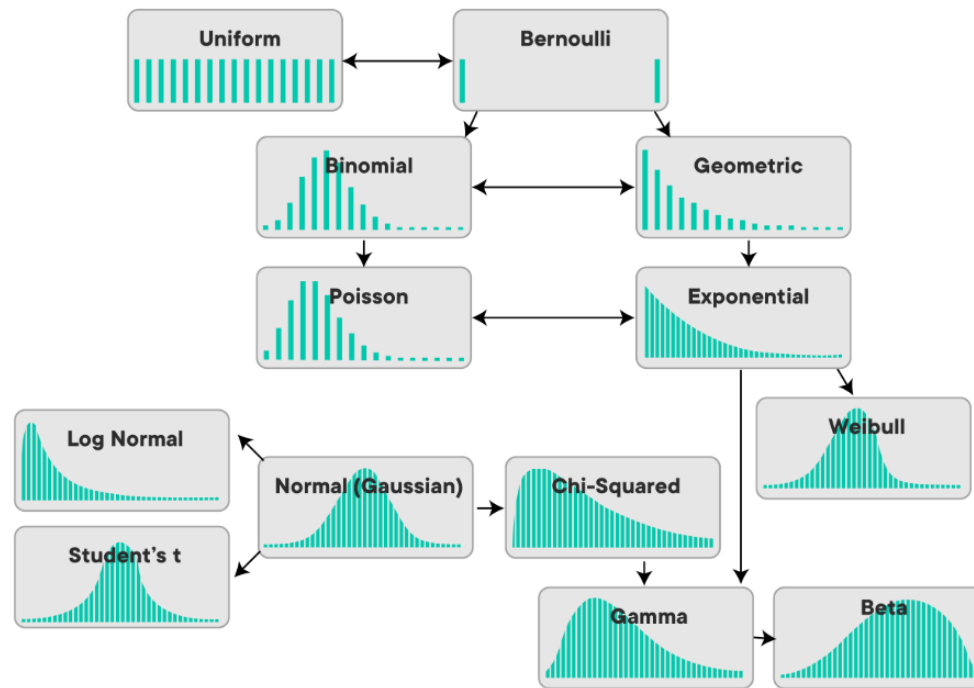


# STATISTICAL DISTRIBUTION -3

~ABHISHEK KUMAR





Discrete distributions

Bernoulli

Poisson

Uniform

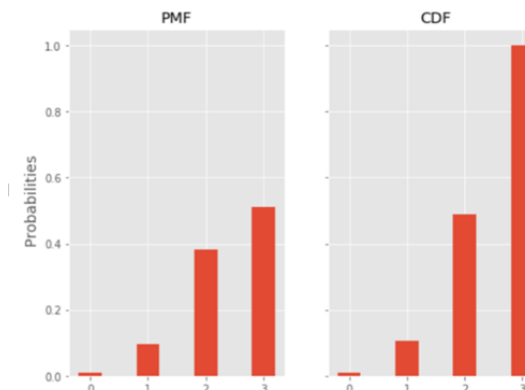
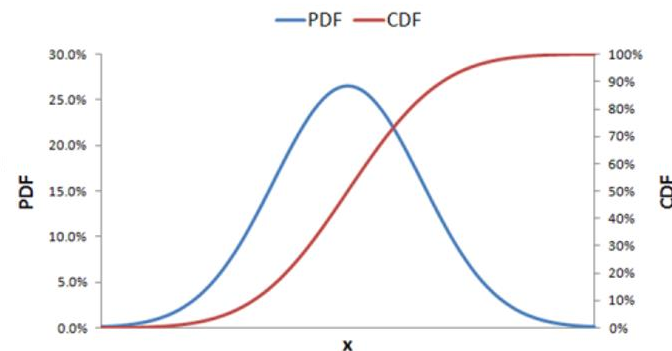
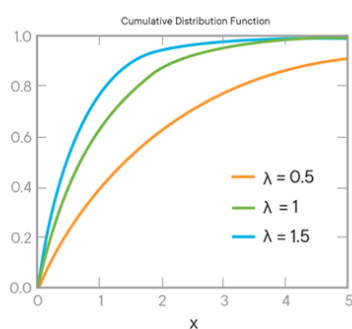
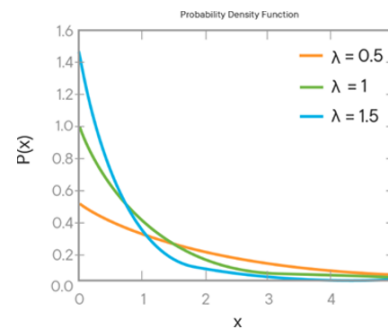
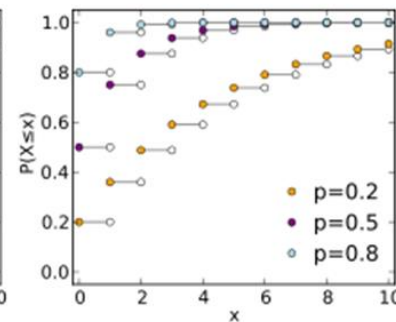
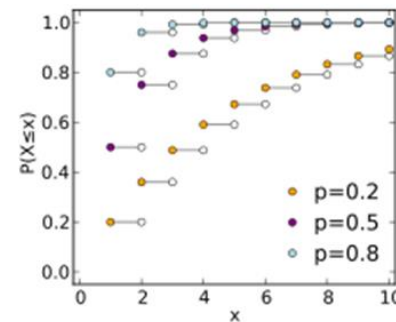
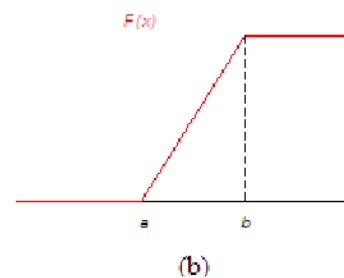
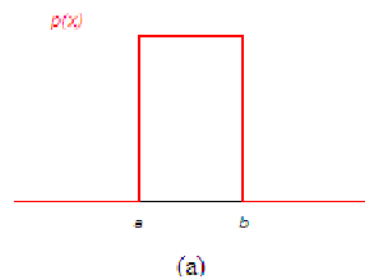
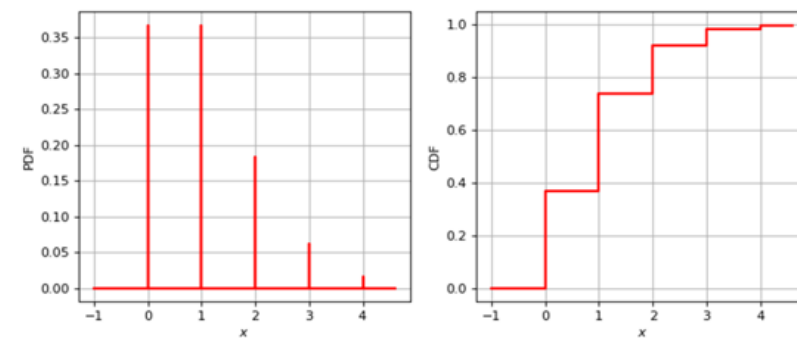
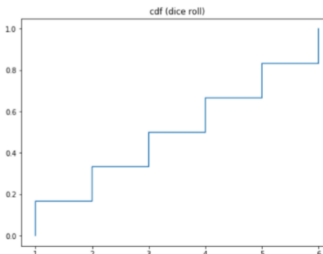
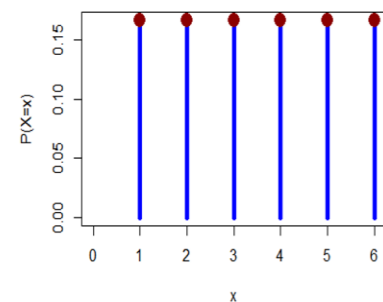
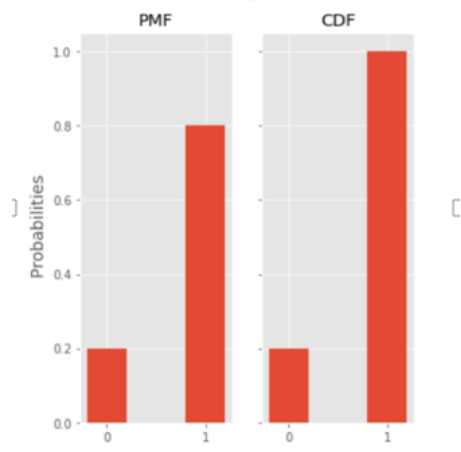
Geometric

Continuous distributions

Normal

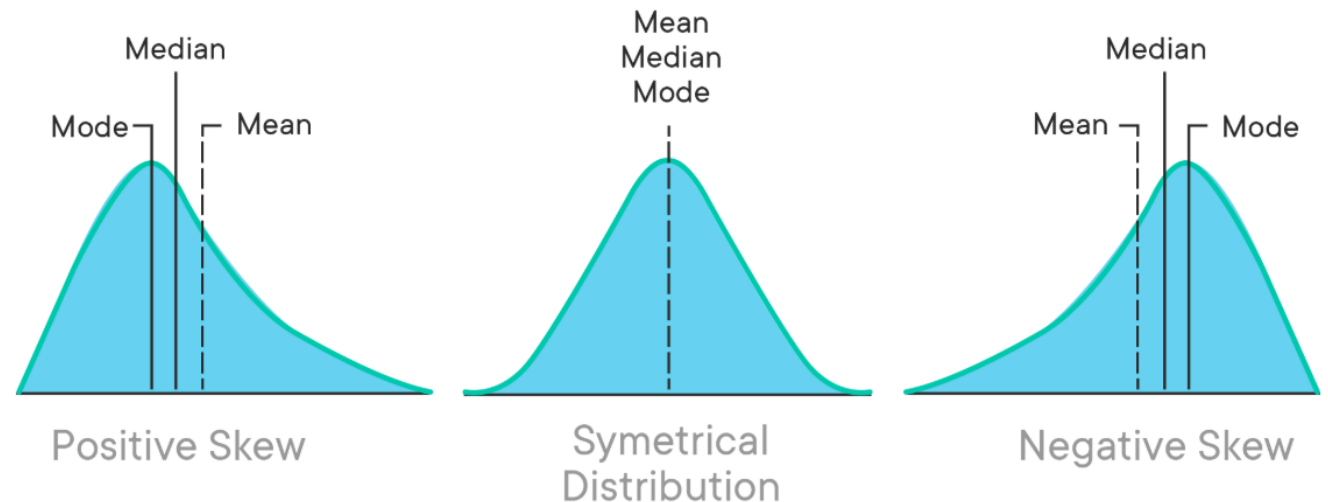
Exponential

Uniform



# SKEWNESS AND KURTOSIS

- **Symmetric Distributions:** If the relative frequency or probability of certain values are equal at equal distances from the point of symmetry.
- **Skewness:** Degree of distortion or deviation from the symmetrical normal distribution.
- **Positively or Negatively skewed.**



$$\frac{\sum_{i=1}^n (Y_i - Y)^3}{\frac{n}{s^3}}$$

$Y$  is the mean,

$s$  is the standard deviation

$n$  is the number of data points.

-0.5 and 0.5 = symmetrical

-1 and -0.5 = moderate negatively skewed

0.5 and 1 = moderate positively skewed

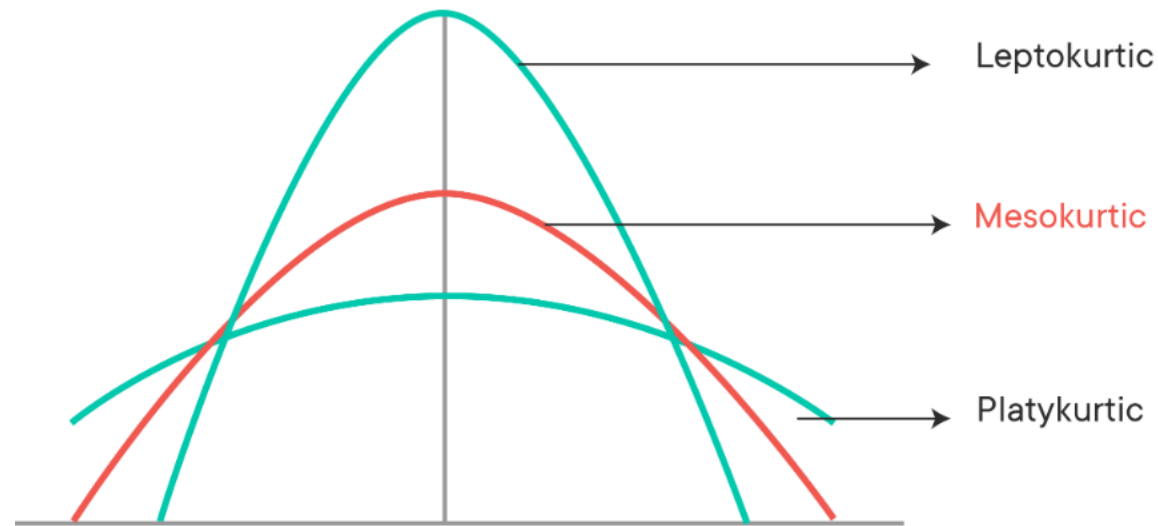
<-1 = highly negatively skewed

>1 = highly positively skewed

# KURTOSIS

- Kurtosis deals with the lengths of tails in the distribution.
- Where skewness talks about extreme values in one tail versus the other, kurtosis aims at identifying extreme values in both tails at the same time!
- Measure of outliers

$$\frac{\sum_{i=1}^n (Y_i - \bar{Y})^4}{\frac{n}{s^4}}$$



**Platykurtic (kurtosis < 3):**

**Mesokurtic (kurtosis  $\approx 3$ )**

**Leptokurtic (kurtosis > 3)**

# GUESS

## Guess the Distribution- 1



A doctor often recommends that patients of his take allergy medication to help alleviate their symptoms. Some of his patients report having relief with medication while others do not.



# GUESS

## Guess the Distribution - 2



A nutritionist is interested in examining the body mass index (BMI) in a population of 60 year old males. She collects data on 100 60 year old males and finds that the average BMI value for these males is 29 and that the distribution has a spread that is symmetrical on both sides of the mean.

# GUESS

## Guess the Distribution - 3



Paul has the option between a high deductible plan and a low deductible plan for health insurance. If Paul chooses the low deductible plan he will pay the first 1000 dollars of the any medical costs. The low deductible plan costs 8000 dollars. If Paul chooses the high deductible plan he will pay the first 2500 dollars of any medical costs. The high deductible plan costs 7500 dollars. Paul found a table of data on the frequency of medical costs.

Cost	Probability
0	30%
1000	25%
4000	20%
7000	20%
15000	5%

# GUESS

## Guess the Distribution - 4



Hospital staff is curious about the amount of staff they need on hand in the evenings. Staff collects data on the number of patients arriving in an emergency room between 10 and 11 pm each day.

THANK YOU!!

