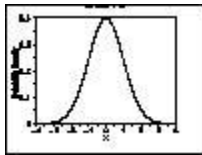
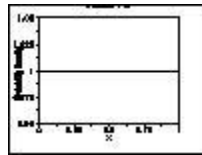


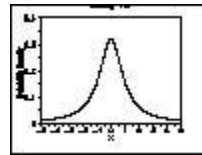
## 1. Types of Distributions



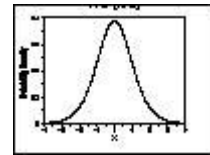
Normal Distribution



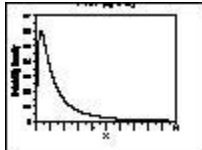
Uniform Distribution



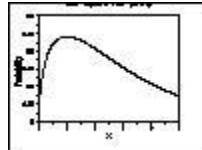
Cauchy Distribution



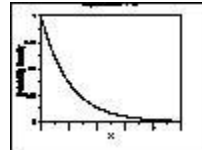
t Distribution



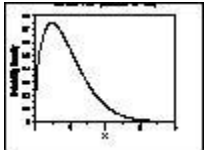
F Distribution



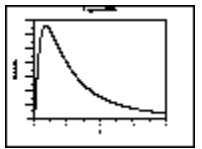
Chi-Square Distribution



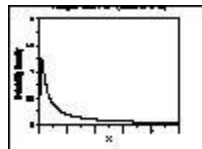
Exponential Distribution



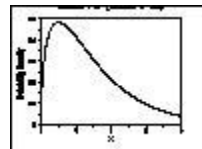
Weibull Distribution



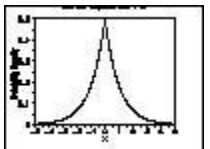
Lognormal Distribution



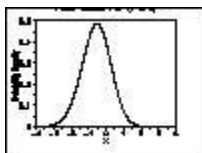
Birnbau-Saunders (Fatigue Life) Distribution



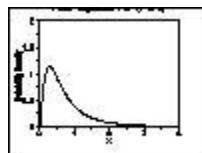
Gamma Distribution



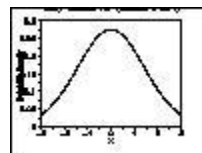
Double Exponential Distribution



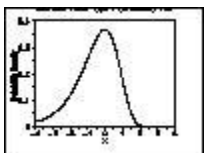
Power Normal Distribution



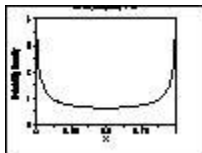
Power Lognormal Distribution



Tukey-Lambda Distribution



Extreme Value Type I Distribution



Beta Distribution

## 2. Types of design patterns, and most used in AI:

Creational patterns are associated with control mechanisms of creating objects. The basic mode of forming an object may be problematic in some projects and may lead to unnecessary complexity in some areas. Creational patterns are supposed to prevent from occurring problems and introduce more control over creating objects. Their task is to separate the processes of creation, completion and representation of an object. There are five well-known design patterns possible to implement in a wide scope of programming languages:

- Abstract Factory Pattern
- Builder Pattern
- Factory Method Pattern
- Prototype Pattern
- Singleton Pattern

-Structural Patterns: the most important feature of these patterns is to facilitate the operation and design applications through finding an easy way to realize dependencies between entities. Due to these patterns, it is easier to design applications which contain independent class libraries. The following structural patterns are one of the best well-known ones:

- Adapter Pattern
- Decorator Pattern
- Facade Pattern
- Proxy Pattern
- Composite Pattern

-Behavioural patterns task is to introduce flexibility to solutions connected with inter-objects communication. They are focused on allocating specific roles and duties between objects in communication. This kind of patterns are:

- Iterator Pattern
- Observer Pattern
- Command Pattern
- Strategy Pattern
- Template Method Pattern

## 3. How to transform to normal distribution

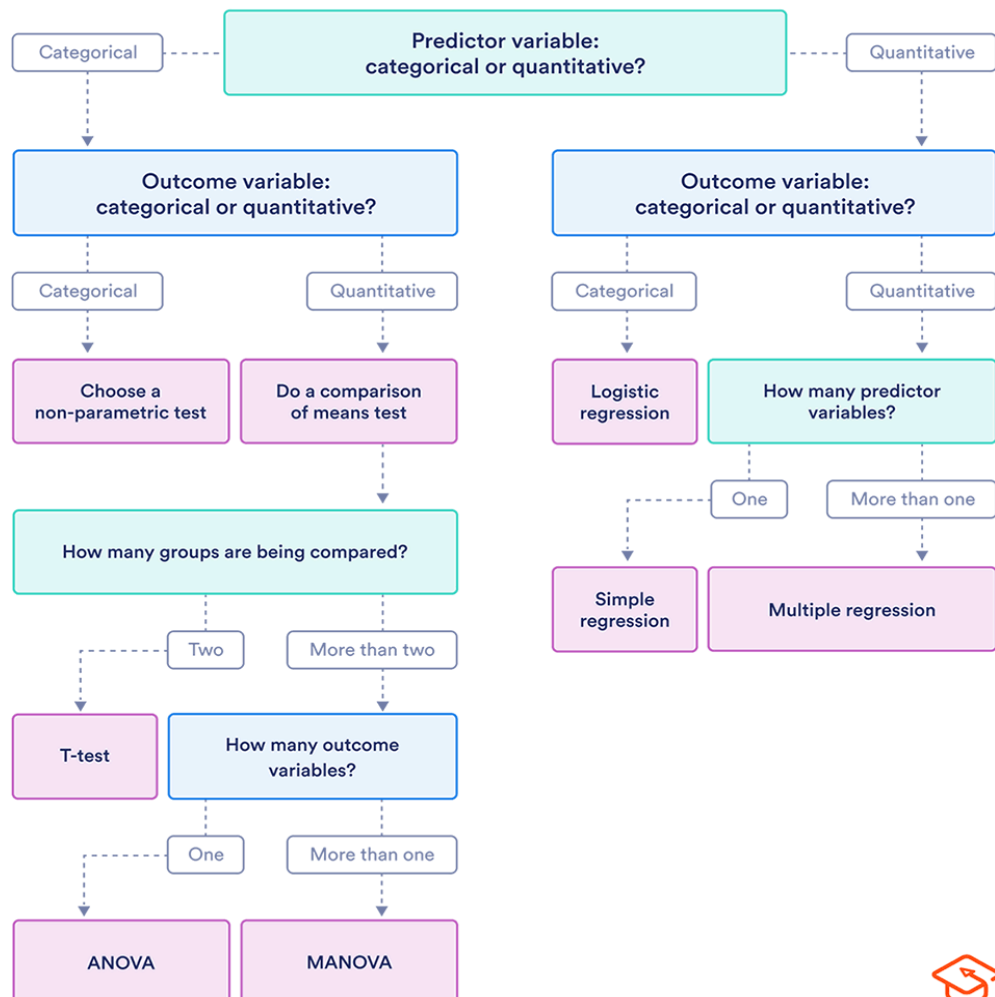
Box-Cox transformation is a statistical technique known to have remedial effects on highly skewed data. Essentially it's just raising the distribution to a power of lambda ( $\lambda$ ) to transform non-normal distribution into normal distribution.

The lambda ( $\lambda$ ) parameter for Box-Cox has a range of  $-5 < \lambda < 5$ . If the lambda ( $\lambda$ ) parameter is determined to be 2, then the distribution will be raised to a power of 2 —  $Y^2$ . The exception to this rule is when the lambda ( $\lambda$ ) parameter is 0 - log will be taken to the distribution —  $\log(Y)$ .

#### 4. Types of statistical tests, on what type they are applied, and best type for each data

## Choosing a statistical test

This flowchart helps you choose among parametric tests



## **5. What is confidence interval and how it is used in data science**

A confidence interval displays the probability that a parameter will fall between a pair of values around the mean. Confidence intervals measure the degree of uncertainty or certainty in a sampling method.