PCA Analysis:

PCA analysis is a statistical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components.

The first principal component has the largest possible [variance](https://en.wikipedia.org/wiki/Variance) followed by 2nd, 3rd Pc so and so forth. So, Choose first few and drop the rest of PC’s

Algorithm steps:

1. Get the data
2. Give a structure to the data
3. Standardize the data
4. With help of Weights and standardized data find out principal scores
5. Calculate the new principal components
6. Drop unimportant principal components from the new PC’s

Properties for PC’s

1. Before PCA n original columns and after PAC its n Principal components
2. Before PCA correlated and after its uncorrelated, ordered by variance, Keep top PC’s and drop the rest

Applications of PCA:

1. PCA is used as a dimensionality reduction technique in domains like face recognition, computer vision, image compression and computational performance enhanced.
2. To ensure the variables are independent of one another
3. To reduce the multicollinearity problem
4. To plot a high dimensional data to 2- dimensional plot

Advantages:

1. Reduces overfitting of the model
2. And it will remove correlation between variables
3. Improves the performance of the algorithms by reducing the training time
4. To get rid of redundancy in data

Disadvantages:

1. Less interpretable of Independent variables, After implementing PCA on the dataset, because our original features will turn into Principal Components
2. Information Loss is also a dis-advantage
3. Standardization is mandatory before applying PCA