**Write in brief about any 5 functions each from any 2 visualization packages used in Python.**

We can import packages matplotlib.pyplot as plt and seaborn as sns

* plt.boxplot(data):- Makes a box and whisker plot for the given data.
* plt.bar(x,y):- Makes a bar chart for the given x items and their corresponding y values.
* plt.scatter(x,y):- Makes a scatter plot for the given x,y variables.
* sns.heatmap(dataset):- Makes a heatmap that shows value of variable of interest across two axis variables as grid of coloured squares.
* sns.pairplot(dataset):- A pairplot plot a pairwise relationships in a dataset. The pairplot function creates a grid of Axes such that each variable in data will by shared in the y-axis across a single row and in the x-axis across a single column.

**What do you mean by autoscaling a 2-D signal?**

Autoscaling is a cloud computing feature that enables organizations to scale cloud services such as server capacities or virtual machines up or down automatically, based on defined situations such as traffic utilization levels.

**What is Signal Smoothing?**

Signal smoothing is approximating the signal to capture important patterns in the data and leaving out the noise. Points higher than adjacent points are reduced and points lower than adjacent points are enhanced or increased to get a smooth signal.

**What are Window functions?**

Window functions are used to apply aggregate and ranking functions over a particular window. OVER clause is used to define that window and it contains PARTITION and ORDER BY clause.

Ex: SELECT name, age, dept, salary AVERAGE (salary) OVER(PARTITION BY dept ORDER BY age) AS avg\_salary FROM employee

**Explain one method to determine peaks in a 2-D signal.**

We can use Baseline to find multiple peaks in a signal. We find out average value of the signal and mark datapoints which go below average. Then we ignore them and find average values of the remaining datapoints and continue the same procedure till we get peaks.

**What is Signal binning?**

Grouping of continuous values in a signal into ‘bins’ of small intervals is called signal binning. It can be used to smoothen the signal by binning range of values into one.

**Write in brief about any one algorithm for Multivariate regression.**

Backward Elimination can be used for multivariate regression. We set a significance level and start building a predictor model using all possible predictors. We check p values of all predictor variables and remove them if their value is greater than p value of that specific significance level as those variables are of no use in prediction.

**Write in brief about any 3 types of Classification Algorithms.**

* **Naïve Bayes**

This algorithm is based on bayes theorem. It is a probabilistic classification algo, i.e., it predicts based on probability of the object. It assumes that all features are independent or unrelated.

* **Decision Tree**

Decision tree is the most powerful and popular tool for classification and prediction. A Decision tree is a flowchart like tree structure, where each internal node denotes a test on an attribute, each branch represents an outcome of the test, and each leaf node (terminal node) holds a class label.

* **Random Forest**

Random forests or random decision forests are an ensemble learning method for classification, regression and other tasks that operates by constructing a multitude of decision trees at training time. Many relatively uncorrelated models (trees) operating as a committee will outperform any of the individual constituent models. The reason for this wonderful effect is that the trees protect each other from their individual errors (if they don’t constantly all err in the same direction).