1. **What are the various features of NumPy?**
2. **What are the steps to use shape for a 1D array, 2D array and 3D/ND array respectively?**
3. **What is the procedure to count the number of times a given value appears in an array of integers?**
4. **What is the procedure to find the indices of an array on NumPy where some condition is true?**
5. **Shown below is the input NumPy array. Delete column one and replace it with** the new column given below.

sampleArray = NumPy.array([[34,43,73],[82,22,12],[53,94,66]])

newColumn = NumPy.array([[10,10,10]])

Expected Output:

[[34 10 73]

 [82 10 12]

  [53 10 66]]

#### **Use numpy to generate array of 25 random numbers sampled from a standard normal**distribution

1. Find Dot product of two arrays
2. Extract all odd numbers from **arr**

# Input arr = np.array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])

#### **Replace items that satisfy a condition without affecting the original array? Input:** [0 1 2 3 4 5 6 7 8 9]

Output: array([ 0, -1, 2, -1, 4, -1, 6, -1, 8, -1])

#### **How to stack two arrays vertically?**

#### **How to get the positions where elements of two arrays match?**

#### **How to reverse the rows of a 2D array?**

1. Create an 8X3 integer array from a range between 10 to 34 such that the difference between each element is 1 and then Split the array into four equal-sized sub-arrays.

**Expected Output:**

Creating 8X3 array using numpy.arange

[[10 11 12]

[13 14 15]

[16 17 18]

[19 20 21]

[22 23 24]

[25 26 27]

[28 29 30]

[31 32 33]]

Dividing 8X3 array into 4 sub array

[array([[10, 11, 12],[13, 14, 15]]),

array([[16, 17, 18],[19, 20, 21]]),

array([[22, 23, 24],[25, 26, 27]]),

array([[28, 29, 30],[31, 32, 33]])]

1. **Create a two 2-D array. Plot it using matplotlib?**
2. Days(x-axis) represents 8 days and Speed represents a car’s speed. Plot a Basic line plot between days and car speed, put x axis label as days and y axis label as car speed and put title Car Speed Measurement.

Days=[1,2,3,4,5,6,7,8]

Speed=[60,62,61,58,56,57,46,63]

1. Plot Simple bar chart showing popularity of Programming Languages.Plot Multiple Bars showing Popularity and Security of major Programming Languages. Also Create Horizontal bar chart using barh function.

Languages =['Python', 'SQL', 'Java', 'C++', 'JavaScript']

Popularity = [56, 39, 34, 34, 29]

Security = [44 ,36 ,55, 50, 42]

1. Plot Histogram, We have a sample data of Students marks of various Students, we will try to plot number of Students by marks range and try to figure out how many Students are average, below-average and Excellent.

Marks = [ 61,86,42,46,73,95,65,78,53,92,55,69,70,49,72,86,64]

Histogram showing Below Average, Average and Excellent distribution

40-60: Below Average

60-80: Average

80-100: Excellent

1. Write a Python program to plot two or more lines with legends, different widths and colors.