DAV INTERNATIONAL SCHOOL, KHARGHAR

TERM 2

ACADEMIC YEAR:2021-2022

PYTHON PROGRAM JOURNAL

NAME: KAVYAM PATEL

CLASS:____X____ SECTION: __A___ ROLL NO: ____22____

SUBJECT: ARTIFICIAL INTELLIGENCE_____

SUBJECT TEACHER: MS. KEERTI GAJWANI_____

INDEX

1.   # Python program to plot a simple bar graph

```python
print('Name: Kavyam Patel')
print('Class and Sec: X A')
print('\n')
import matplotlib.pyplot as mod

left = [ 1, 2, 3, 4, 5]
height = [10, 24, 36, 40, 5]
tick_label = ['one', 'two', 'three', 'four', 'five']
mod.bar(left, height, tick_label = tick_label, width = 0.8, color = ['magenta', 'brown',])
mod.xlabel('X Axis')
mod.ylabel('Y Axis')
mod.title('My bar chart!')
mod.legend(height)
mod.show()
```
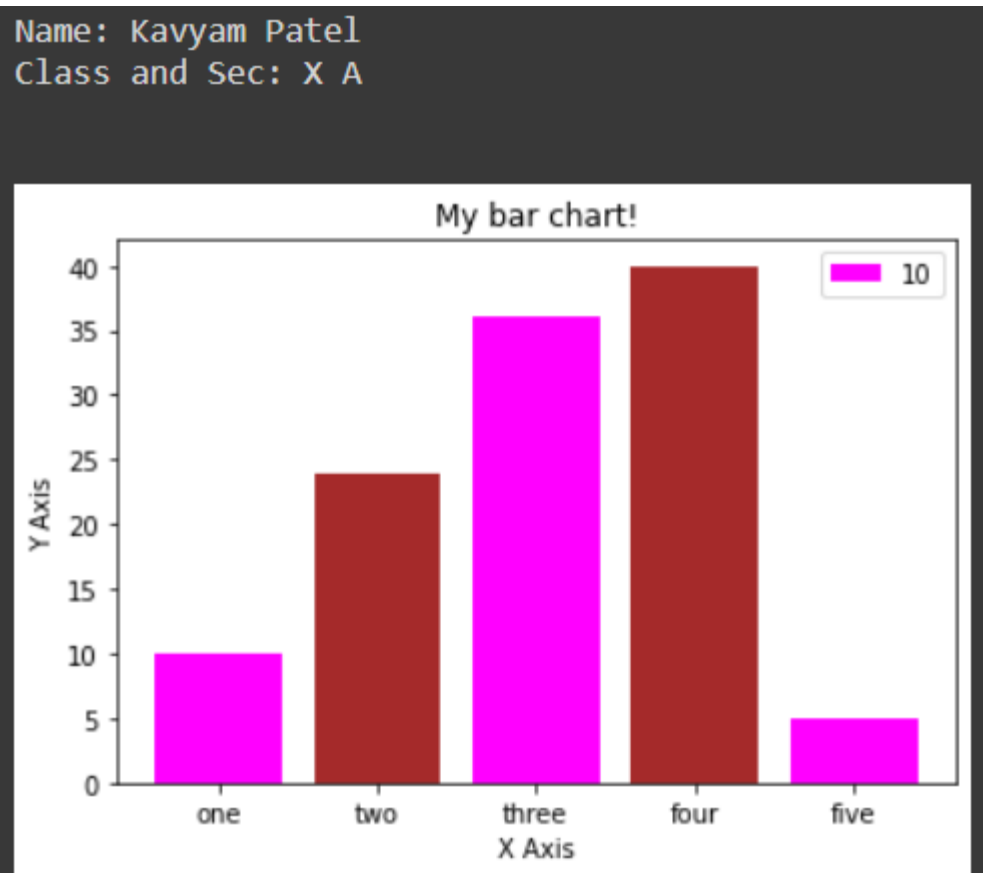
output:

2.   # Python program to plot a simple line chart

```python
print('\nName: Kavyam Patel')

print('Class and Sec: X A')

print('')


# importing the required module

import matplotlib.pyplot as mod

# x axis values

x = [1,2,3,4,5,6]

# corresponding y axis values

y = [2,4,1,5,2,6]

# plotting the points

mod.plot(x, y, color='green', linestyle='dashed', linewidth = 3,marker='o',
        markerfacecolor='blue', markersize=12)

# setting x and y axis range

mod.ylim(1,8)

mod.xlim(1,8)

# naming the x axis

mod.xlabel('x - axis')

# naming the y axis

mod.ylabel('y - axis')

# giving a title

mod.title('MY GRAPH!')

# plotting legend

mod.legend()

# function to show the plot

mod.show()
```

output:

MY GRAPH!

y - axis

x - axis
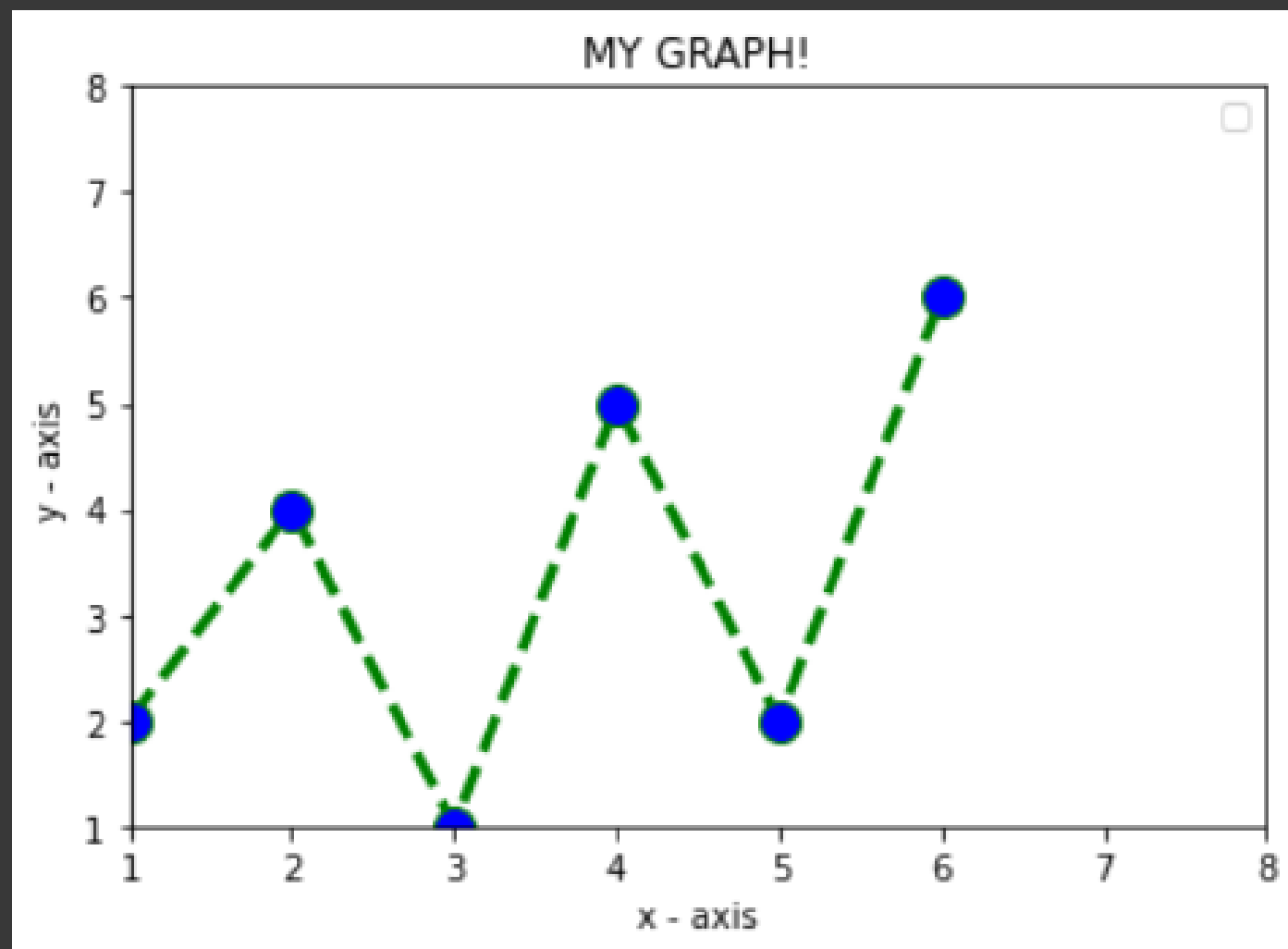
3. **# Python program to plot a simple pie chart**

print('\nName: Kavyam Patel')

print('Class and Sec: X A')

 # importing the required module

import matplotlib.pyplot as plt

 # defining labels

activities = ['eat', 'sleep', 'work', 'play']

 # portion covered by each label

slices = [3, 7, 8, 6]

 # color for each label

colors = ['r', 'y', 'g', 'b']

 # plotting the pie chart

plt.pie(slices, labels = activities, colors=colors, startangle=90, shadow = True, radius = 1.2)

 # plotting legend

plt.legend()

Output:
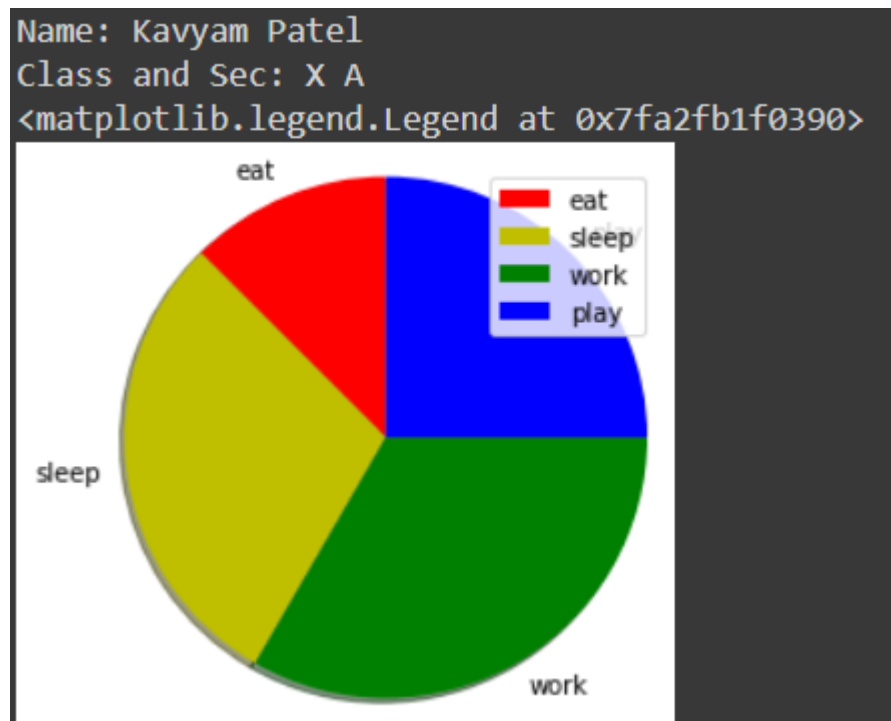
```python
4.    # Python program to plot a scatter chart
print('\nName: Kavyam Patel')
print('Class and Sec: X A')


# importing the required module
import matplotlib.pyplot as plt
# x-axis values
x = [1,2,3,4,5,6,7,8,9,10]
# y-axis values
y = [2,4,5,7,6,8,9,11,12,12]
 # plotting points as a scatter plot
plt.scatter(x, y, label= "stars", color= "green", marker= "*")
# x-axis label
plt.xlabel('x - axis')
# frequency label
plt.ylabel('y - axis')
# plot title
plt.title('My scatter plot!')
# showing legend
plt.legend()
# function to show the plot
plt.show()
```

Output:
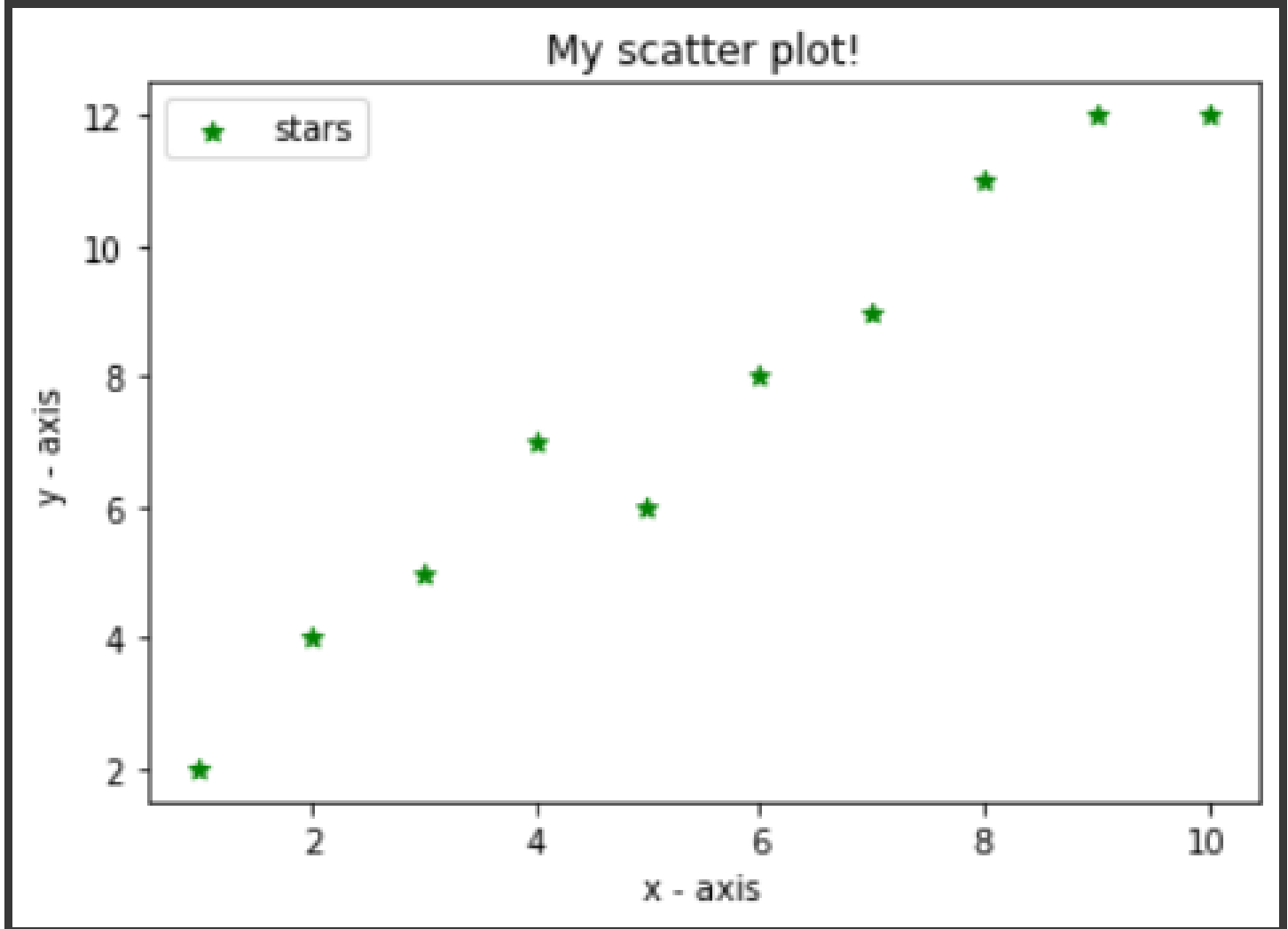
5. ARRAY MANIPULATION

```python
import numpy as np
a = np.array(42)                        # array with one element
print(a)
print(a.ndim)                           #print dimension
print("*****************************")
b = np.array([1, 2, 3, 4, 5])           #one dimensional array
print(b)
print(b.ndim)
print("*****************************")
c = np.array([[1, 2, 3], [4, 5, 6]])    #two dimensional array
print(c)
print(c.ndim)
print("*****************************")
a = np.array([1, 2, 3, 4])
print(a[-1])                            #accessing element from an array
print(a[1:5])                           #slicing array
print("*****************************")
```

Output:

```
Name: Kavyam Patel
Class: X A
Roll No.: 22

42
0
**********************************
[1 2 3 4 5]
1
**********************************
[[1 2 3]
 [4 5 6]]
2
**********************************
4
[2 3 4]
**********************************
```

6. PROGRAM TO USE PANDAS (**execute each code separately)

a)

```python
import pandas as pd

mydataset = {  'cars': ["BMW", "Volvo", "Ford"],

 'passings': [3, 7, 2] }

print ("DATA FRAME")

df = pd.DataFrame(mydataset)

print(df)

print ("SERIES")

sr = pd.Series(mydataset)

print(sr)
```

```
Kavyam Patel
X A

DATA FRAME
      cars  passings
0      BMW         3
1    Volvo         7
2     Ford         2
SERIES
cars          [BMW, Volvo, Ford]
passings                [3, 7, 2]
dtype: object
```

b)

```python
import pandas as pd

mydataset = {

 'cars': ["BMW", "Volvo", "Ford"],

 'passings': [3, 7, 2] }

df = pd.DataFrame(mydataset)

df.index
```

```
Kavyam Patel
X A

RangeIndex(start=0, stop=3, step=1)
```

c)

```python
import pandas as pd
mydataset = {
  'cars': ["BMW", "Volvo", "Ford"],
  'passings': [3, 7, 2] }
df = pd.DataFrame(mydataset)
df.describe() #quick stats
```

	passings
count	3.000000
mean	4.000000
std	2.645751
min	2.000000
25%	2.500000
50%	3.000000
75%	5.000000
max	7.000000

d)

```python
import pandas as pd
mydataset = {'cars': ["BMW", "Volvo", "Ford"],
  'passings': [3, 7, 2] }
df = pd.DataFrame(mydataset)
df.sort_index(ascending=False)
```

	cars	passings
2	Ford	2
1	Volvo	7
0	BMW	3

e)

```python
import pandas as pd
mydataset = {  'cars': ["BMW", "Volvo", "Ford"],
  'passings': [3, 7, 2] }
df = pd.DataFrame(mydataset)
df[0:3] #selection
```

	cars	passings
0	BMW	3
1	Volvo	7
2	Ford	2

f)

```python
import pandas as pd
mydataset = {  'cars': ["BMW", "Volvo", "Ford"],
 'passings': [3, 7, 2] }
df = pd.DataFrame(mydataset)
df.max()
```

```
Kavyam Patel
X A

cars           Volvo
passings           7
dtype: object
```

g)

```python
import pandas as pd
mydataset = {  'cars': ["BMW", "Volvo", "Ford"],
 'passings': [3, 7, 2] }
df = pd.DataFrame(mydataset)
df.mean()
```

```
Kavyam Patel
X A

  import sys
passings     4.0
dtype: float64
```
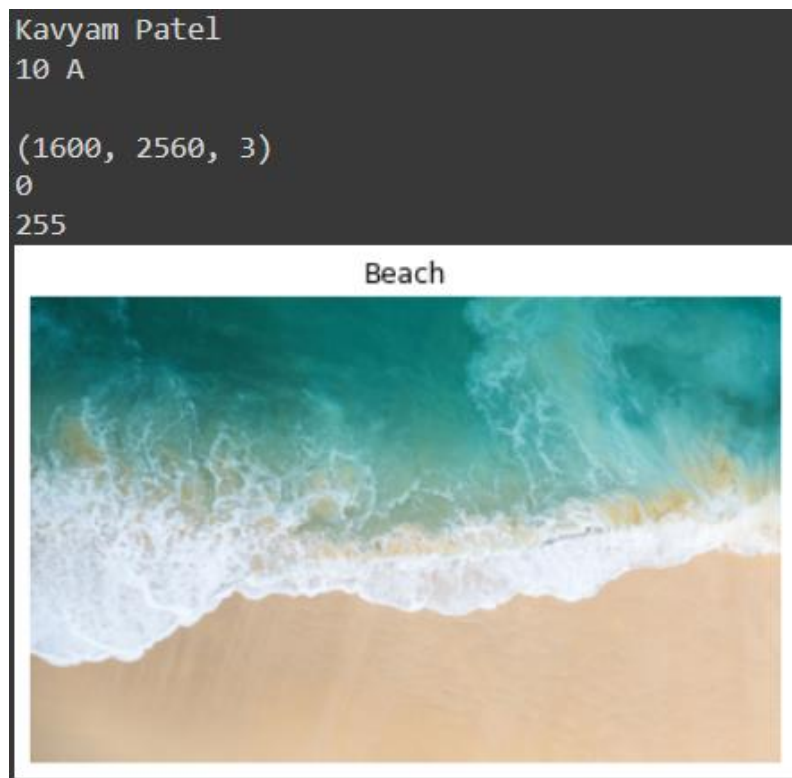
7. PROGRAM TO USE OPEN CV FOR IMAGE MANIPULATION

```
print('\nKavyam Patel')

print('10 A')

print('')

import cv2                          # import OpenCV

from matplotlib import pyplot as plt # import matplotlib

import numpy as np                  # import numpy

img = cv2.imread('/content/drive/MyDrive/Wallpapers/Mobile/To Do/Sea.jpg')   #Load the image file into memory in current session

plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))     #show img and convert BGR to RGB color scheme

print(img.shape)                 #give image size

print(img.min())                 #min pixel value

print(img.max())                 #max pixel value

plt.title('Beach')

plt.axis('off')

plt.show()
```

8. PROGRAM TO CROP IMAGE

```python
print('\nKavyam Patel')

print('X A')

print('')

import cv2                          # import OpenCV

from matplotlib import pyplot as plt # import matplotlib

import numpy as np                  # import numpy

img = cv2.imread('/content/drive/MyDrive/Wallpapers/Mobile/To Do/Sea.jpg')        #Load the image file into memory in current session

roi = img[150:250,100:200] #img[range of y, range of x] #crop image

plt.imshow(roi)

plt.title('Beach')

plt.axis('off')

plt.show()
```

9. PROGRAM TO RESIZE IMAGE
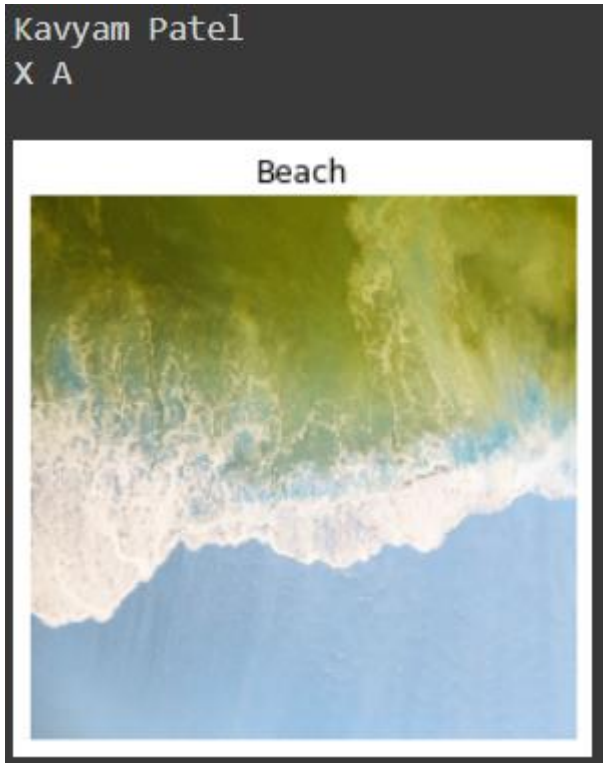
```
print('\nKavyam Patel')

print('X A')

print('')

import cv2                              # import OpenCV

from matplotlib import pyplot as plt  # import matplotlib

import numpy as np                       # import numpy

img = cv2.imread('/content/drive/MyDrive/Wallpapers/Mobile/To Do/Sea.jpg')        #Load
the image file into memory in current session


resized = cv2.resize(img, (200, 200))        # resize image

plt.imshow(resized)

plt.title('Beach')

plt.axis('off')

plt.show()
```

10.   PROGRAM TO CHANGE PIXEL COLOR

```python
print('\nKavyam Patel')

print('X A')

print('')

import cv2                              # import OpenCV

from matplotlib import pyplot as plt  # import matplotlib

import numpy as np                      # import numpy

img = cv2.imread('/content/drive/MyDrive/Wallpapers/Mobile/To Do/Sea.jpg')        #Load the image file into memory in current session

img[150:250,100:200] = [255,255,255]

plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))

plt.title('Beach')

plt.axis('off')

plt.show()
```
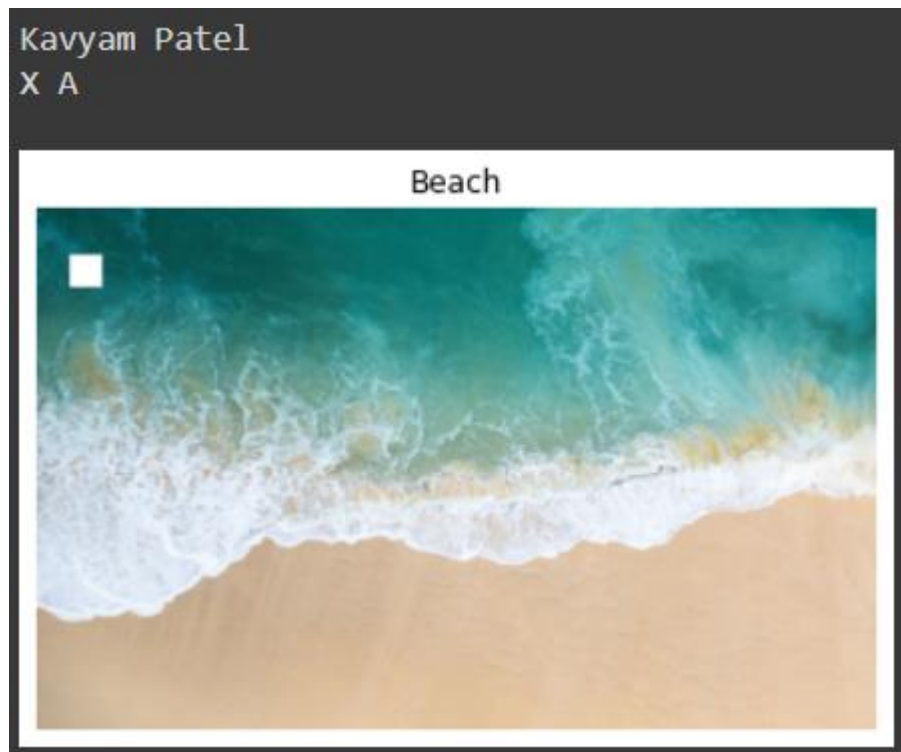
11. CREATE A 4 W'S PROBLEM CANVAS FOR GIVEN SCENARIO.

SCENARIO:

XYZ COMPANY IS RECEIVING NEARLY 5000 E MAILS DAILY, MOST OF WHICH ARE SPAM AND REST ARE FOR DIFFERENT DEPARTMENTS. THE COMPANY NEEDS TO SEGREGATE E MAILS IN THE INBOX AS PER THEIR CATEGORY AND DEPARTMENT AND TRIGGER THE E MAILS TO VARIOUS DEPARTMENTS AUTOMATICALLY.

OUR	STAKEHOLDERS XYZ Company	WHO
HAS/HAVE A PROBLEM	PROBLEM/ISSUE/NEED Segregation of Emails	WHAT
WHEN/WHILE	CONTEXT / SITUATION 5000 Emails received daily, most of them spam, and non-segregated for departments.	WHERE
IDEAL SOLUTION	BENEFIT OF SOLUTION Email Filter	WHY

DOMAIN OF SOLUTION PROPOSED: __NLP_____

PROBLEM STATEMENT SUMMARY: XYZ Company has an issue with segregation of 5000

Emails received daily, most of which being spam and not being sorted for different

departments. An Email filter will be the best solution using NLP.

12. NLP ACTIVITY

CORPUS:

Ram and Raj are good students. Both are good friends. Raj is the topper of the school. Ram stands second.

SENTENCES SEGMENTATION:

Document 1: Ram and Raj are good students	Document 2: Both are good friends
Document 3: Raj is the topper of the school	Document 4: Ram stands second

TOKENIZATION:

Ram	and	Raj	are	good	students
Both	good	is	the	topper	Of
school	stands	second			

AFTER STOP WORDS REMOVAL:

Ram	Raj	good	students	friends	topper
school	stands				

AFTER CONVERTING TO COMMON CASE:

ram	raj	good	students	friends	topper
school	stands				

AFTER STEMMING:

ram	raj	good	student	friend	topper
school	stand				

AFTER LEMMATIZATION:

ram	raj	good	student	friend	topper
school	stand				

CREATE DOCUMENT VECTOR AND WRITE TERM FREQUENCY:

TERM	ram (1)	raj (1)	good (1)	student (1)	friend (2)
FREQUENCY	1/6	1/6	1/6	1/6	1/4
TERM	topper (3)	school (3)	stand (4)		
FREQUENCY	1/7	1/7	1/3		

WRITE INVERSE FREQUENCY:

TERM	ram	raj	good	student	friend
INV FREQ	4/2	4/2	4/2	4/1	4/1
TERM	topper	school	stand		
INV FREQ	4/1	4/1	4/1		