INDIAN SCHOOL AL WADI AL KABIR

PRACTICAL RECORD FILE

ARTIFICIAL INTELLIGENCE

CLASS 10 SESSION 2024-25

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• What is the output color when you put R=G=255, B=0?
• What is the output color when you put R=255, G=0, B=255?
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• Change the image to grayscale
• Print the shape of image
• Display the maximum and minimum pixels of image
• Crop the image.
• Save the Image</td><td></td><td></td></tr>
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Advanced Python

1. Write a program to read todays date (only date Part) from user. Then display how may days are left in the current month.

```
import datetime
td=0
now=datetime.datetime.now()
print(now.day)
if now.month==2:
    td=28
elif now.month in(1,3,5,7,8,10,12):
    td=31
else:
    td=30
print("Total remaining days in the current month are : ", td-now.day)
```

2. Write a program to check the given year is leap year or not.

```
year = int(input("Enter year"))
if (year % 4) == 0:
   if (year % 100) == 0:
       if (year % 400) == 0:
           print("{0} is a leap year".format(year))
       else:
           print("{0} is not a leap year".format(year))
   else:
       print("{0} is a leap year".format(year))
else:
   print("{0} is not a leap year".format(year))
```

3. An electric power distribution company charges its domestic consumers as follows:

Consumption Units	Rate of Charge
0-100	Rs. 1 per unit
101-300	Rs. 100 plus Rs. 1.25 per unit in excess of 100
301-500	Rs. 350 plus Rs. 1.50 per unit in excess of 300
500 and above	Rs. 650 plus Rs. 1.75 per unit in excess of 500

Write a program that read the customer number & power consumed and prints the amount to be paid by the customer. Note that output should be well formatted.

```
#Input Data
cno=int(input("Enter Consumer Number:"))
pc=int(input("Enter power consumed:")) #Computing bill amount based on power consumed
if pc>0 and pc<=100:
 bill_amt=pc*1
elif pc>100 and pc<=300:
  bill_amt=100+(pc-100) *1.25
elif pc>300 and pc<500:
  bill_amt=350+(pc-300)*1.50
elif pc>500:
  bill_amt=650+(pc-500)*1.75
else:
  print("Invalid Power Consumed Units") #Printing the bill in proper format print("~"*60)
print("\t\tABC Power Company Ltd.")
print("~"*20)
print("Consumer Number:",cno)
print("Consumed Units:",pc)
print("_____")
print("Bill Amount:",bill_amt)
```

4. Write a program to calculate compound & simple interest after taking the principle, rate and time.

```
#Compund Interest
p=int(input("Enter the Principal"))
r=int(input("Enter the Interest Rate"))
t=int(input("Enter the Tenure"))
temp=1+r/100
f=1
for i in range(1,t+1):
    f=f*temp
Amount=p*f
interest=Amount-p
print("The interest on ",p," with rate ",r," is ",interest)
```

5. Write a program to add the elements of two list.

```
List1=[1,2,3,4]
List2=[5,6,7,8]
new_list=[]
l=len(List1)
i=0
for i in range(l):
    new_list.append(List1[i]+List2[i])
print("the new list after adding the elements is:",new_list)
```

6. Write a program to create a list1= [10,20,30,40]. add the elements [14,15,12] using extend function. Now sort the final list in ascending order and print it.

```
list1=[10,20,30,40]
list2=[14,15,12]
#adding elements to a list using extend function
list1.extend(list2)
print("the extended list:",list1)
#sorting the list
list1.sort()
#dislay the list
print("the sorted list is:",list1)
```

7. Write a program to create a list of students' marks with user-defined values and find the maximum.

```
#Take input for n lines
n=int(input("Enter no. of subjects:"))
#Creating empty list
l=[]
#Accepting marks and appending marks into the list
for i in range(n):
  m=int(input("Enter marks:"))
  l.append(m)
print("Maximum marks scored:",max(l))
```

Data Science Programs

8. Write a program to create a 2D array using NumPy.

```
#import numpy package
import numpy as np
#Creating array using arange() function
arr=np.arange(5,45,5)
#reshaping array for 2D
arr=arr.reshape(2,4) #printing array
print(arr)
```

9. Write a program to convert a python list to a NumPy array.

```
#Import NumPy Package
import numpy as np #Creating empty list
l = []
#Take input for n no. of elements
n=int(input("Enter the no. of elements:")) #Append the values into the list
for i in range(n):
 val=int(input("Enter value "+str(i+1)+":"))
 l.append(val)
#Converting list into numpy array
arr=np.array(l)
print("Array:",arr)
```

10. Write a program to develop a matrix of 3x3 with values from 11 to 28.

```
#import numpy package
import numpy as np
#Creating array using arange() function
arr=np.arange(11,28,2)
#reshaping array for 2D
arr=arr.reshape(3,3) #printing array
print(arr)
```

11. Write a program to calculate Mean, Median and Mode using NumPy.

```
import numpy as np
import statistics as st
array1 = np.array([5,6,1,3,4,5,6,2,7,8,6,5,4,6,5,1,2,3,4])
print(array1)
print("\nMean: ", np.mean(array1))
print("\nMedian: ", np.median(array1))
print("\nMode: ", st.mode(array1))
```

12. Write a program to calculate variance and standard deviation for the given data:
[33,44,55,67,54,22,33,44,56,78,21,31,43,90,21,33,44,55,87]

```
#import statistics
import statistics
#Creating list
l=[33,44,55,67,54,22,33,44,56,78,21,31,43,90,21,33,44,55,87]

#Display varaince and standard deviation value using functions
print("Variance:%.2f"%statistics.variance(l))
print("Standard Deviation:%.2f"%statistics.stdev(l))
```

13. Write a program to display a scatter chart for the following points and customize the chart as you wish:
(2,5),(9,10),(8,3),(5,7),(6,18)

```
import matplotlib.pyplot as plt
x=[2,9,8,5,6]
y=[5,10,3,7,18]
# plotting the scatter plot
plt.scatter(x,y)
plt.show()
#customizing the scatter plot
plt.scatter(x,y,c ="pink",linewidths = 2,marker ="s",edgecolor ="green",s = 50)
plt.xlabel("X axis")
plt.ylabel("Y axis")
plt.title("The scatter polt")
plt.show()
```

14. Consider the following data of a clothes store and plot the data on the line chart and customize the chart as you wish:

Jeans	*T-Shirts*	*Shirts*
1500	4400	6500
3500	4500	5000
6500	5500	5800
6700	6000	6300
6000	5600	6200
6800	6300	4500

```
import matplotlib.pyplot as plt
import numpy as np
x = np.array(["March","April","May","June","July","August"])  # X-axis points
y = np.array([1500,3500,6500,6700,6000,6800]) # Y-axis points
y1= np.array([4400,4500,5500,6000,5600,6300])
y3= np.array([6500,5000,5800,6300,6200,4500])

plt.xlabel("Months")
plt.ylabel("Sale")
plt.title("Sale of cloth in each month")

Jeans,=plt.plot(x,y,label="Jeans",c="red",marker='o')
Tshirt,=plt.plot(x,y1,label="T-shirt",c="blue",marker='s')
Shirt,=plt.plot(x,y3,label="Shirt",c="green",marker='^')
plt.legend()
plt.show()
```

15.

a. Read csv file saved in your system and display 10 rows.

```
import numpy as np
import pandas as pd
df=pd.read_csv("C:\\Users\\ibm\\Desktop\\color_RGB.csv")
print(df.head(10))
```

b. Read csv file of students marks and plot a bar graph with the given data and customize the chart as you wish

```
import matplotlib.pyplot as plt
import pandas as pd

#Creating data frame with the given data
newframe=pd.read_csv("C:\\Users\\ibm\\Desktop\\ClassAvg_exams.csv")
print(newframe)
premidterm_exam=newframe["Premidterm"].tolist()
subjects=newframe["Subjects"].tolist()
#Creating bar graph with different bar colours
# for PRE MIDTERM
plt.subplot(1, 2, 1)
plt.bar(subjects,premidterm_exam,color=['black','red','green','blue','yellow','orange'])
plt.xlabel('subjects')
plt.ylabel('Class Average')
plt.title('premidterm')
```

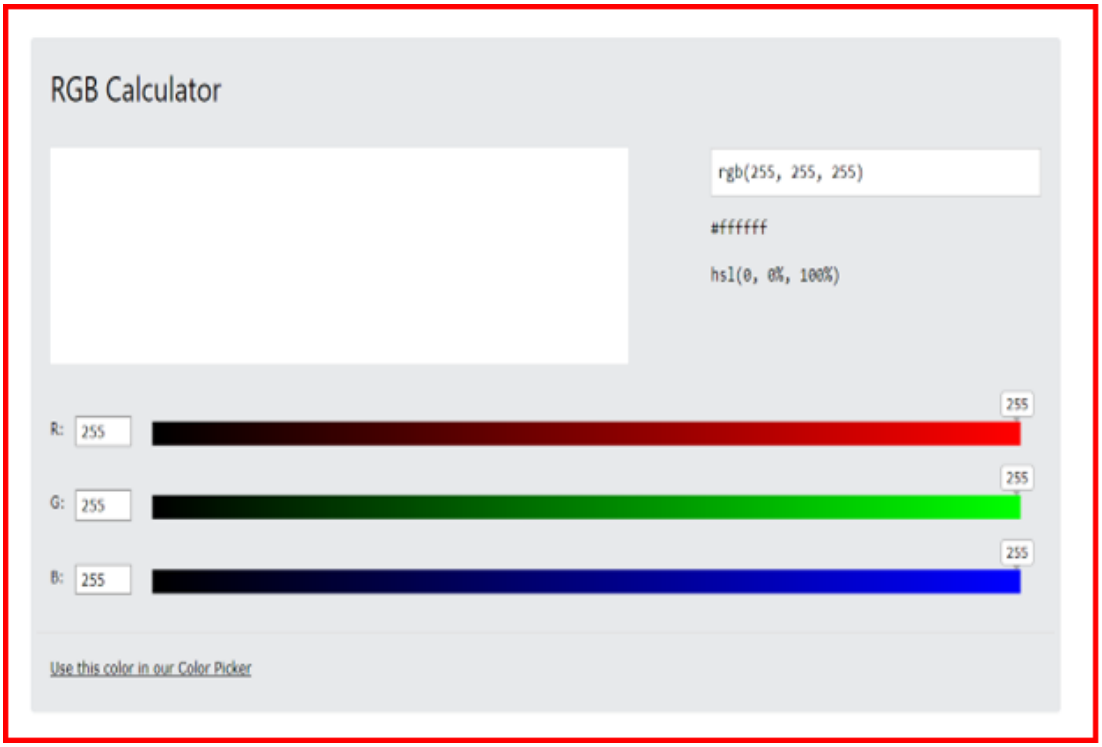
Unit 5 Computer Vision

16. Visit this link (https://www.w3schools.com/colors/colors_rgb.asp). On the basis of this online tool, try and write answers of all the below-mentioned questions.

- What is the output colour when you put R=G=B=255?
- What is the output colour when you put R=G=255,B=0?
- What is the output colour when you put R=255,G=0,B=255?
- What is the output colour when you put R=0,G=255,B=255?
- What is the output colour when you put R=G=B=0?
- What is the output colour when you Put R=0,G=0,B=255?
- What is the output colour when you Put R=255,G=0,B=0?
- What is the output colour when you put R=0,G=255,B=0?
- What is the value of your colour?

Solution:1.

1. White



2. Yellow
3. Pink
4. Cyan
5. Black
6. Blue
7. Red
8. Green
9. R=0, G=0, B=255

17.Do the following tasks in OpenCV.

- Load an image and Give the title of the image
- Change the colour of image and Change the image to grayscale
- Print the shape of image
- Display the maximum and minimum pixels of image
- Crop the image and extract the part of an image
- Save the Image

a. Load Image and Give the title of image:

```
#import required module cv2, matplotlib and numpy
import cv2
import matplotlib.pyplot as plt
import numpy as np
#Load the image file into memory
img = cv2.imread('E:\\nursery\\nursery.jpg') #Display
plt.imshow(img)
plt.title('Boy')
plt.axis('off')
plt.show()
```

b. Change the color of image and Change the image to grayscale

```
#import required module cv2, matplotlib and numpy
import cv2
import matplotlib.pyplot as plt
import numpy as np
#Load the image file into memory
img = cv2.imread('E:\\nursery\\nursery.jpg') #Chaning image colour image colour
plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))
plt.title('Boy')
plt.axis('off')
plt.show()
```

c. Print the shape of image

```
import cv2
img = cv2.imread('E:\\nursery\\nursery.jpg',0)
print(img.shape)
```

d. Display the maximum and minimum pixels of image

```
import cv2
img = cv2.imread('E:\\nursery\\nursery.jpg',0)
print(img.min())
print(img.max())
```

e. Crop the image and extract the part of an image

```
import cv2
import matplotlib.pyplot as plt
img = cv2.imread('E:\\nursery\\nursery.jpg')
pi=img[150:400,100:200]
plt.imshow(cv2.cvtColor(pi, cv2.COLOR_BGR2RGB))
plt.title('Boy')
plt.axis('off')
plt.show()
```

f. Save the Image

```
import cv2
import matplotlib.pyplot as plt
img = cv2.imread('E:\\nursery\\nursery.jpg')
plt.imshow(img)
cv2.imwrite('E:\\nursery\\nursery.jpg',img)
plt.title('Boy')
plt.axis('off')
plt.show()
```