Indian School Al Wadi Al Kabir

PRACTICAL FILE

CBSE Class 10 - Artificial Intelligence (417)

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1. Develop a Python Program to check leap year or not

```
year = int(input("Enter a year: "))
# 1. Year is divisible by 4
# 2. If divisible by 100, it must also be divisible by 400
if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
    print(year, "is a Leap Year")
else:
    print(year, "is NOT a Leap Year")
```

2. Develop a Python Program to Calculate compound & simple interest after taking the principle, rate and time.

```
P = float(input("Enter the Principal amount: "))
R = float(input("Enter the Rate of Interest (per annum): "))
T = float(input("Enter the Time (in years): "))
# Calculating Simple Interest
SI = (P * R * T) / 100
# Calculating Compound Interest (compounded annually)
Amount = P * (1 + R / 100) ** T
CI = Amount - P
print("\n--- Results ---")
print("Simple Interest =",SI)
print("Compound Interest =",CI)
print("Total Amount (Compound) =",Amount)
```

3. Develop a Python Program Write a program to add the elements of two list.

```
List1=[1,2,3,4]
List2=[4,5,2,3]
new_list=[]
length=len(List1)
i=0
for i in range(length):
    new_list.append(List1[i]+List2[i])
print(new_list)
```

4. Develop a Python Program to Create a list of students' marks with user-defined values and find the maximum.

```
n=int(input("enter the number of students"))
#creating empty list
list_marks=[]
#accepting marks and appending marks into the list
for i in range(n):
    m=int(input(f"enter mark of student {i}:"))
    list_marks.append(m)
maximum_marks=max(list_marks)
print("maximum mark is: ", maximum_marks)
```

5. Develop a Python Program to Count Vowels in a String

```
text = input("Enter a string: ")
vowels = "aeiouAEIOU"
count = 0
for char in text:
    if char in vowels:
        count += 1
print("Number of vowels in the string:", count)
```

6. Develop a Python Program to find the Factorial of a Number

```
num = int(input("Enter a number: "))
factorial = 1
for i in range(1, num + 1):
    factorial=factorial*i
print("The factorial is:", factorial)
```

7. Develop a Python Program to print the multiplication table

```
n = int(input("Enter a number: "))
i = 1
while i <= 10:
    print(n, "x", i, "=", n * i)
    i = i + 1
```

8. Develop a Python Program to calculate Mean, Median, and Mode using NumPy

```
import numpy as np
data = [10, 20, 20, 30, 40, 50]
mean = np.mean(data)
median = np.median(data)
counts = {}
# bincount() counts how many times each number appears
counts = np.bincount(data)
mode = np.argmax(counts)#Finds the number with the highest count
print("Data:", data)
print("Mean:", mean)
print("Median:", median)
print("Mode:", mode)
```

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

```
import numpy as np
# Create an array with values from 11 to 19 (3x3 = 9 elements)
matrix = np.arange(11, 20).reshape(3, 3)
print("3x3 Matrix with values from 11 to 19:")
print(matrix)
```

10. Develop a Python Program to display Line Chart from (2,5) to (9,10)

```
import matplotlib.pyplot as plt
x = [2, 9]
y = [5, 10]
plt.plot(x, y, marker='o')
plt.title("Line Chart")
plt.xlabel("X-axis")
plt.ylabel("Y-axis")
plt.grid(True)
plt.show()
```

11. Develop a Python Program to display Scatter Chart for the points (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]
plt.scatter(x, y, color='red')
plt.title("Scatter Chart")
plt.xlabel("X-axis")
plt.ylabel("Y-axis")
plt.grid(True)
plt.show()
```

12. Develop a Python Program to create a data frame and display 3 rows

```
import pandas as pd
data = {
    "Name": ["sheetal", "John", "Mary", "David", "Sara"],
    "Age": [30, 12, 14, 13, 11],
    "Marks": [90, 85, 92, 78, 88]
}
df = pd.DataFrame(data)
print(df.head(3),"\n")
```

13. Develop a Python Program to read CSV file and display its information

```
import pandas as pd
data = {
    "Name": ["sheetal", "John", "Mary", "David", "Sara"],
    "Age": [30, 12, 14, 13, 11],
    "Marks": [90, 85, 92, 78, 88]
}
df = pd.DataFrame(data)
print(df.info())
```

14. Develop a Python Program to read an image and display using Python

```
import cv2
import matplotlib.pyplot as plt
# Read the image
image = cv2.imread("C:/Users/Teacher/OneDrive/Desktop/steam.png")
# Convert BGR to RGB for correct colours
image = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
# Display the image
plt.imshow(image)
plt.title("STEAM Image")
plt.axis("off")
plt.show()
```

15. Develop a Python Program to read an image and identify its shape

```
import cv2
import matplotlib.pyplot as plt
image = cv2.imread("image.jpg")
height, width, channels = image.shape
print("Width:", width)
print("Height:", height)
print("Number of Channels:", channels)
if channels == 1:
    print("This is a Grayscale image.")
elif channels == 3:
    print("This is a Colored image (RGB).")
else:
    print("Unknown image type.")
cv2.imshow("Image", image)
plt.title("name of image")
plt.axis("off")
plt.show()
```

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