1.Write a Python program to calculate the area of a rectangle given its length and width.

**Code:**

n=int(input("enter width "))

m=int(input("enter height "))

area=n\*m

print("area of rectangle",area)

**Output:**

enter width 4

enter height 5

area of rectangle 20

2. Write a program to convert miles to kilometers

Code:

m=float(input("enter a number "))

km=m\*1.6

print("kilometers",km)

Output:

enter a number 2

kilometers 3.2

3. Write a function to check if a given string is a palindrome.

Code:

def isPalindrome(string):

if(string==string[::-1]):

print("is a Palindrome")

else:

print("not a palindrome")

string=input("Enter a string ")

print(isPalindrome(string))

Output:

Enter a string food

not a palindrome

4. Write a Python program to find the second largest element in a list.

Code:

l1=[20,30,10,80,60]

l2=list(set(l1))

l2.sort()

print("Second largest number",l2[-2])

Output:

Second largest number 60

5. Explain what indentation means in Python.

Ans: the spaces at the beginning of a code line.

6. Write a program to perform set difference operation.

Code:

E = {0, 2, 4, 6, 8};

N = {1, 2, 3, 4, 5};

# set union

print("Union of E and N is",E | N)

# set intersection

print("Intersection of E and N is",E & N)

# set difference

print("Difference of E and N is",E - N)

# set symmetric difference

print("Symmetric difference of E and N is",E ^ N)

Output:

Union of E and N is {0, 1, 2, 3, 4, 5, 6, 8}

Intersection of E and N is {2, 4}

Difference of E and N is {0, 8, 6}

Symmetric difference of E and N is {0, 1, 3, 5, 6, 8}

7. Write a Python program to print numbers from 1 to 10 using a while loop.

Code:

n=1

while(n<=10):

print(n,end=' ')

n=n+1

Output:

1 2 3 4 5 6 7 8 9 10

8. Write a program to calculate the factorial of a number using a while loop.

Code:

num = int(input("Enter a number: "))

factorial = 1

if num < 0:

print(" Factorial does not exist for negative numbers")

elif num == 0:

print("The factorial of 0 is 1")

else:

for i in range(1,num + 1):

factorial = factorial\*i

print("The factorial of",num,"is",factorial)

Output:

Enter a number: 5

The factorial of 5 is 120

9. Write a Python program to check if a number is positive, negative, or zero using if-elif-else

statements.

Code:

def NumberCheck(a):

if a > 0:

print("Number given by you is Positive")

elif a < 0:

print("Number given by you is Negative")

else:

print("Number given by you is zero")

a = float(input("Enter a number as input value: "))

NumberCheck(a)

Output:

Enter a number as input value: 24

Number given by you is Positive

10. Write a program to determine the largest among three numbers using conditional

statements.

Code:

num1 = float(input("Enter first number: "))

num2 = float(input("Enter second number: "))

num3 = float(input("Enter third number: "))

if (num1 >= num2) and (num1 >= num3):

largest = num1

elif (num2 >= num1) and (num2 >= num3):

largest = num2

else:

largest = num3

print("The largest number is", largest)

Output:

Enter first number: 53

Enter second number: 42

Enter third number: 30

The largest number is 53.0

11. Write a Python program to create a numpy array filled with ones of given shape.

Code:

import numpy as np

def create\_ones\_array(shape):

ones\_array = np.ones(shape)

return ones\_array

# Example usage:

shape = (3, 4)

ones\_array = create\_ones\_array(shape)

print("Array of ones with shape", shape, ":\n", ones\_array)

Output:

Array of ones with shape (3, 4) :

[[1. 1. 1. 1.]

[1. 1. 1. 1.]

[1. 1. 1. 1.]]

12. Write a program to create a 2D numpy array initialized with random integers.

Code:

import numpy as np

def create\_random\_array(shape, low, high):

random\_array = np.random.randint(low, high, shape)

return random\_array

shape = (3, 4)

low = 0

high = 10

random\_array = create\_random\_array(shape, low, high)

print("Random array with shape", shape, ":\n", random\_array)

Output:

Random array with shape (3, 4) :

[[5 4 9 8]

[4 4 0 5]

[7 7 7 0]]

13. Write a Python program to generate an array of evenly spaced numbers over a specified

range using linspace.

Code:

import numpy as np

def generate\_linspace(start, stop, num):

linspace\_array = np.linspace(start, stop, num)

return linspace\_array

start = 0 # Start of the range

stop = 10 # End of the range

num = 5 # Number of evenly spaced samples

linspace\_array = generate\_linspace(start, stop, num)

print("Array of evenly spaced numbers from", start, "to", stop, "with", num, "samples:\n", linspace\_array)

Output:

Array of evenly spaced numbers from 0 to 10 with 5 samples:

[ 0. 2.5 5. 7.5 10. ]

14. Write a program to generate an array of 10 equally spaced values between 1 and 100 using

linspace.

Code:

import numpy as np

values = np.linspace(1, 100, 10)

print("Array of 10 equally spaced values between 1 and 100:")

print(values)

Output:

Array of 10 equally spaced values between 1 and 100:

[ 1. 12. 23. 34. 45. 56. 67. 78. 89. 100.]

15. Write a Python program to create an array containing even numbers from 2 to 20 using

arange.

Code:

import numpy as np

even\_numbers = np.arange(2, 21, 2)

print("Array containing even numbers from 2 to 20:")

print(even\_numbers)

Output:

Array containing even numbers from 2 to 20:

[ 2 4 6 8 10 12 14 16 18 20]

16. Write a program to create an array containing numbers from 1 to 10 with a step size of 0.5

using arange.

Code:

import numpy as np

numbers = np.arange(1, 10.5, 0.5)

print("Array containing numbers from 1 to 10 with a step size of 0.5:")

print(numbers)

Output:

Array containing numbers from 1 to 10 with a step size of 0.5:

[ 1. 1.5 2. 2.5 3. 3.5 4. 4.5 5. 5.5 6. 6.5 7. 7.5 8. 8.5 9. 9.5 10. ]