Machine Learning LAB ASSIGNMENT

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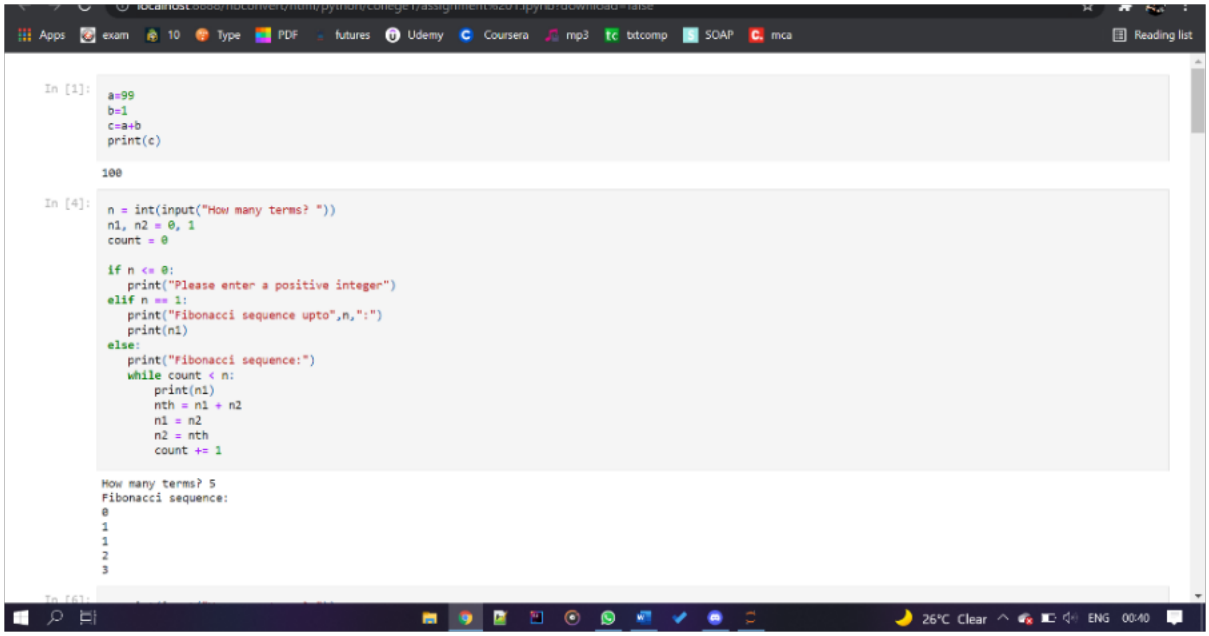
1. Write a program to use the mathematical operators.
2. write a program to take an input of numbers from the user and print the Fibonacci series to the terminal number.
3. Write a program to print the factorial of the number input by the user.
4. Write a program to check whether a given number is a prime number or not using loops.
5. Write a program to demonstrate the importing of modules of python.
6. Write a program to demonstrate the use of nested if statements.
7. Write a program to demonstrate the use of the else clause.
8. Write a program to illustrate the usage of Tuples.
9. Write a program for searching an element and sorting a List.
10. Write a program to illustrate the usage of Dictionaries.

Programs on Statistical Concepts and introduction to Linear Algebra using Python

1. Write a program to find the mean. mode and median of the given range of numbers.
2. Write a program to calculate the standard deviation of a given set of numbers.
3. Write a program to calculate the addition of two 3x3 matrices.
4. Write a program to calculate the multiplication of two 3x3 matrices.
5. Write a program to calculate the inverse of the given matrix.
6. Write a program to calculate the transpose of the given matrix.



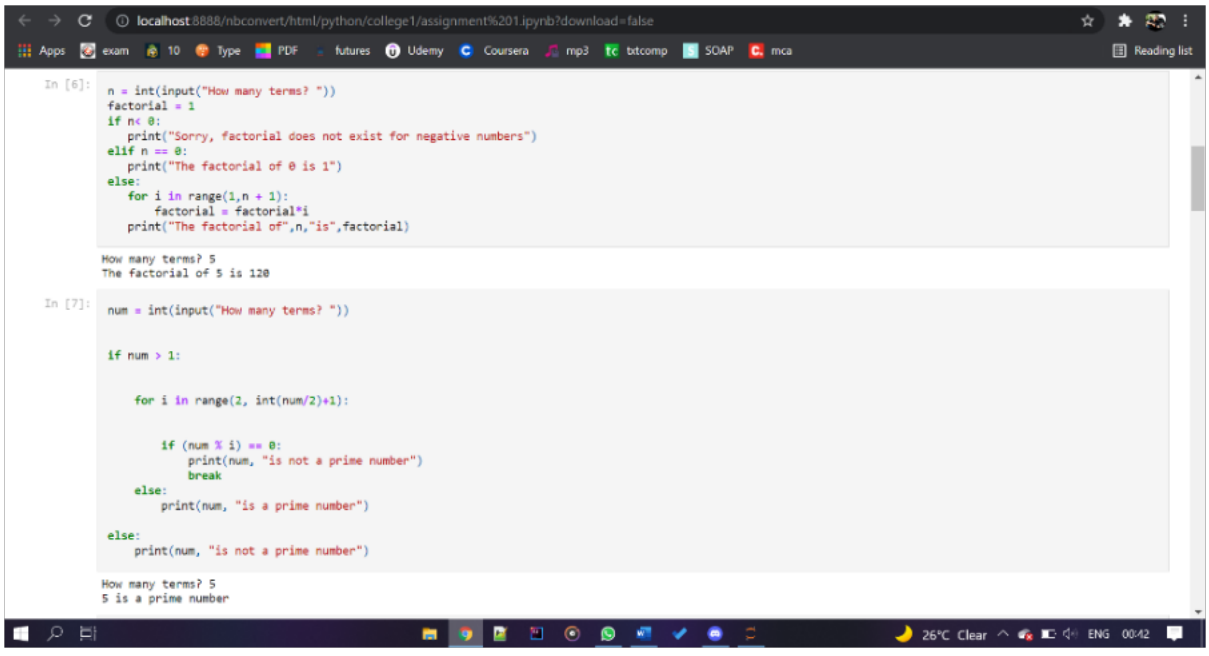
In [1]:
```
a=99
b=1
c=a+b
print(c)
```

```
100
```

In [4]:
```
n = int(input("How many terms? "))
n1, n2 = 0, 1
count = 0

if n <= 0:
   print("Please enter a positive integer")
elif n == 1:
   print("Fibonacci sequence upto",n,":")
   print(n1)
else:
   print("Fibonacci sequence:")
   while count < n:
       print(n1)
       nth = n1 + n2
       n1 = n2
       n2 = nth
       count += 1
```

```
How many terms? 5
Fibonacci sequence:
0
1
1
2
3
```



In [6]:
```
n = int(input("How many terms? "))
factorial = 1
if n< 0:
   print("Sorry, factorial does not exist for negative numbers")
elif n == 0:
   print("The factorial of 0 is 1")
else:
   for i in range(1,n + 1):
       factorial = factorial*i
   print("The factorial of",n,"is",factorial)
```

```
How many terms? 5
The factorial of 5 is 120
```

In [7]:
```
num = int(input("How many terms? "))


if num > 1:


    for i in range(2, int(num/2)+1):


        if (num % i) == 0:
            print(num, "is not a prime number")
            break
    else:
        print(num, "is a prime number")

else:
    print(num, "is not a prime number")
```

```
How many terms? 5
5 is a prime number
```

In [7]:
```
num = int(input("How many terms? "))


if num > 1:


    for i in range(2, int(num/2)+1):


        if (num % i) == 0:
            print(num, "is not a prime number")
            break
    else:
        print(num, "is a prime number")

else:
    print(num, "is not a prime number")
```

```
How many terms? 5
5 is a prime number
```

In [8]:
```
import math
print("The value of pi is", math.pi)
```

```
The value of pi is 3.141592653589793
```

In [10]:
```
a=99
b=1
def add(a, b):
   """This program adds two numbers and return the result"""

   result = a + b
   return result
```

In [27]:
```
i = 10
if (i == 10):
    if (i < 15):
        print("i is smaller than 15")
    if (i < 12):
        print("i is smaller than 12 too")
    else:
        print("i is greater than 15")
```

```
i is smaller than 15
i is smaller than 12 too
```

In [31]:
```
num = int(input("How many terms? "))
if num >= 0:
    print("Positive or Zero")
else:
    print("Negative number")
```

```
How many terms? 6
Positive or Zero
```

In [7]:
```
my= "Laksh", "abhishek ", "Gehu"
print(my)


a, b, c = my

print(a)
print(b)
print(c)
```

```
('Laksh', 'abhishek ', 'Gehu')
Laksh
abhishek
Gehu
```

In [6]:
```
m = ()
print(m)
m = (1, 2, 3)
print(m)
m = (1, "Laksh", 3.4)
print(m)
m = ("Hero", [10, 44, 66], (11, 42, 43))
print(m)
```

```
()
(1, 2, 3)
(1, 'Laksh', 3.4)
('Hero', [10, 44, 66], (11, 42, 43))
```

In [10]:
```
m = ('p','e','r','m','i','t')
print(m[0])
print(m[5])
n = ("Gehu", [8, 4, 6], (1, 2, 3))
print(n[0][3])
print(n[1][1])
print(n[2][1])
```

```
p
t
u
4
2
```

In [11]:
```
my_tuple = ('G', 'e', 'H', 'u', 'D', 'u','N')


print(my_tuple[-1])


print(my_tuple[-6])
```

```
N
e
```

In [14]:
```
def linearsearch(arr, x):
    for i in range(len(arr)):
        if arr[i] == x:
            return i
    return -1
arr = ['t','u','t','o','g','i','a','l']
x = 'a'
print("element found at index "+str(linearsearch(arr,x)))
```

```
element found at index 6
```

In [15]:
```
def bubblesort(list):


    for iter_num in range(len(list)-1,0,-1):
        for idx in range(iter_num):
            if list[idx]>list[idx+1]:
                temp = list[idx]
                list[idx] = list[idx+1]
                list[idx+1] = temp
list = [19,2,31,45,6,11,121,27]
bubblesort(list)
print(list)
```

```
[2, 6, 11, 19, 27, 31, 45, 121]
```

In [16]:
```
my_dict = {'Place': 'Doon', 'Continent': 'Asia'}
my_dict['Date'] = 10
print(my_dict)
my_dict['address'] = 'India'
print(my_dict)
```

```
{'Place': 'Doon', 'Continent': 'Asia', 'Date': 10}
{'Place': 'Doon', 'Continent': 'Asia', 'Date': 10, 'address': 'India'}
```

In [26]:
```
import statistics
n_num = [1, 2, 3, 34, 35,35,2,3,3,8]
n = len(n_num)

get_sum = sum(n_num)
mean = get_sum / n
n_num.sort()

if n % 2 == 0:
    median1 = n_num[n//2]
    median2 = n_num[n//2 - 1]
    median = (median1 + median2)/2
else:
    median = n_num[n//2]

print("Median is: " + str(median))
print("Mean / Average is: " + str(mean))
print("Mode of given data set is % s" % (statistics.mode(n_num)))
```

```
Median is: 3.0
Mean / Average is: 12.6
Mode of given data set is 3
```

In [31]:
```
X = [[1,2,-3],
    [-4 ,5,6],
    [7 ,18,9]]

Y = [[9,-1,7],
    [6,0,4],
    [-3,-20,-1]]

result = [[X[i][j] + Y[i][j]  for j in range
(len(X[0]))] for i in range(len(X))]

for r in result:
    print(r)
```

```
[10, 1, 4]
[2, 5, 10]
[4, -2, 8]
```

In [32]:
```
X = [[1,2,-3],
    [-4 ,5,6],
    [7 ,18,9]]

Y = [[9,-1,7],
    [6,0,4],
    [-3,-20,-1]]


result = [[sum(a*b for a,b in zip(X_row,Y_col)) for Y_col in zip(*Y)] for X_row in X]

for r in result:
   print(r)
```

```
[30, 59, 18]
[-24, -116, -14]
[144, -187, 112]
```

In [34]:

```
import numpy as np

A = np.array([[[1., 2.], [3., 4.]],
              [[1, 3], [3, 5]]])


print(np.linalg.inv(A))
```

```
[[[-2.    1.  ]
  [ 1.5  -0.5 ]]

 [[-1.25  0.75]
  [ 0.75 -0.25]]]
```

In [35]:

```
X = [[12,7],
    [4 ,5],
    [3 ,8]]
result = [[0,0,0],
          [0,0,0]]
for i in range(len(X)):
   for j in range(len(X[0])):
       result[j][i] = X[i][j]
for r in result:
   print(r)
```

```
[12, 4, 3]
[7, 5, 8]
```