Darshan UNIVERSITY
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Python Programming - 2301CS404

Lab - 8

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User Defined Function

01) Write a function to calculate BMI given mass and height. (BMI = mass/h**2)

In [3]:
```
def calculate_bmi(mass, height):
    bmi = mass / (height ** 2)
    return bmi
mass = float(input("Enter your mass in kilograms: "))
height = float(input("Enter your height in meters: "))
bmi = calculate_bmi(mass, height)
print(f"Your BMI is: {bmi:.2f}")
```

```
Your BMI is: 23.88
```

02) Write a function that add first n numbers.

In [4]:
```
def sum_of_first_n_numbers(n):
    return n * (n + 1) // 2
n = int(input("Enter a positive integer (n): "))
result = sum_of_first_n_numbers(n)
print(f"The sum of the first {n} natural numbers is: {result}")
```

```
The sum of the first 25 natural numbers is: 325
```

03) Write a function that returns 1 if the given number is Prime or 0 otherwise.

In [7]:
```
def is_prime(num):
    if num <= 1:
        return 0
    for i in range(2, int(num**0.5) + 1):
        if num % i == 0:
            return 0
    return 1
number = int(input("Enter a number: "))
result = is_prime(number)
print(f"The number {number} is prime: {result}")
```

```
The number 13 is prime: 1
```

04) Write a function that returns the list of Prime numbers between given two numbers.

In [8]:
```
def is_prime(num):

    if num <= 1:
        return False
    for i in range(2, int(num**0.5) + 1):
        if num % i == 0:
            return False
    return True

def primes_between(start, end):
    prime_list = []
    for num in range(start, end + 1):
        if is_prime(num):
            prime_list.append(num)
    return prime_list
start = int(input("Enter the starting number: "))
end = int(input("Enter the ending number: "))

prime_numbers = primes_between(start, end)
print(f"Prime numbers between {start} and {end}: {prime_numbers}")
```

```
Prime numbers between 25 and 56: [29, 31, 37, 41, 43, 47, 53]
```

05) Write a function that returns True if the given string is Palindrome or False otherwise.

In [10]:
```
def is_palindrome(s):
    s = s.replace(" ", "").lower()
    # Compare the string with its reverse
    return s == s[::-1]
input_string = input("Enter a string: ")
result = is_palindrome(input_string)
print(f"Is the string a palindrome? {result}")
```

```
Is the string a palindrome? True
```

06) Write a function that returns the sum of all the elements of the list.

In [11]:
```
def sum_of_list_elements(lst):
    return sum(lst)
numbers = list(map(float, input("Enter elements of the list separated by spaces: ")
result = sum_of_list_elements(numbers)
print(f"The sum of all elements in the list is: {result}")
```

```
The sum of all elements in the list is: 16.0
```

07) Write a function to calculate the sum of the first element of each tuples inside the list.

In [12]:
```
def sum_of_first_elements(tuples_list):
    return sum(t[0] for t in tuples_list)
tuples_list = [(1, 2), (3, 4), (5, 6)]
result = sum_of_first_elements(tuples_list)
print(f"The sum of the first elements is: {result}")
```

```
The sum of the first elements is: 9
```

08) Write a recursive function to find nth term of Fibonacci Series.

In [23]:
```
def fibonacci(n):
    if n <= 0:
        return 0
    elif n == 1:
        return 1
    else:
        return fibonacci(n - 1) + fibonacci(n - 2)
n = int(input("Enter the term position (n): "))
result = fibonacci(n)
print(f"The {n}th term of the Fibonacci Series is: {result}")
```

```
The 11th term of the Fibonacci Series is: 89
```

09) Write a function to get the name of the student based on the given rollno.

Example: Given dict1 = {101:'Ajay', 102:'Rahul', 103:'Jay', 104:'Pooja'} find name of student whose rollno = 103

In [24]:
```
def get_student_name(rollno, student_dict):
    return student_dict.get(rollno, "Roll number not found")
dict1 = {101: 'Ajay', 102: 'Rahul', 103: 'Jay', 104: 'Pooja'}
rollno = int(input("Enter the roll number: "))
name = get_student_name(rollno, dict1)
print(f"The name of the student with roll number {rollno} is: {name}")
```

```
The name of the student with roll number 102 is: Rahul
```

10) Write a function to get the sum of the scores ending with zero.

Example : scores = [200, 456, 300, 100, 234, 678]

Ans = 200 + 300 + 100 = 600

In [25]:
```
def sum_of_scores_ending_with_zero(scores):
    return sum(score for score in scores if score % 10 == 0)
scores = [200, 456, 300, 100, 234, 678]
result = sum_of_scores_ending_with_zero(scores)
print(f"The sum of scores ending with zero is: {result}")
```

```
The sum of scores ending with zero is: 600
```

11) Write a function to invert a given Dictionary.

hint: keys to values & values to keys

Before : {'a': 10, 'b':20, 'c':30, 'd':40}

After : {10:'a', 20:'b', 30:'c', 40:'d'}

In [26]:
```
def invert_dictionary(original_dict):
    return {value: key for key, value in original_dict.items()}
original_dict = {'a': 10, 'b': 20, 'c': 30, 'd': 40}
inverted_dict = invert_dictionary(original_dict)
print("Original Dictionary:", original_dict)
print("Inverted Dictionary:", inverted_dict)
```

```
Original Dictionary: {'a': 10, 'b': 20, 'c': 30, 'd': 40}
Inverted Dictionary: {10: 'a', 20: 'b', 30: 'c', 40: 'd'}
```

12) Write a function to check whether the given string is Pangram or not.

hint: Pangram is a string containing all the characters a-z atlest once.

"the quick brown fox jumps over the lazy dog" is a Pangram string.

In [30]:
```
def is_pangram(s):
    s = s.lower()
    alphabet_set = set("abcdefghijklmnopqrstuvwxyz")
    return alphabet_set.issubset(set(s))
input_string = input("Enter a string: ")
if is_pangram(input_string):
    print("The string is a pangram.")
else:
    print("The string is not a pangram.")
```

```
The string is a pangram.
```

13) Write a function that returns the number of uppercase and lowercase letters in the given string.

example : Input : s1 = AbcDEfgh ,Ouptput : no_upper = 3, no_lower = 5

In [32]:
```
def count_upper_lower(s):
    no_upper = 0
    no_lower = 0
    for char in s:
        if char.isupper():
            no_upper += 1
        elif char.islower():
            no_lower += 1
    return no_upper, no_lower
s1 = input('Enter a String:')
no_upper, no_lower = count_upper_lower(s1)
print(f"Number of uppercase letters: {no_upper}")
print(f"Number of lowercase letters: {no_lower}")
```

```
Number of uppercase letters: 6
Number of lowercase letters: 6
```

14) Write a lambda function to get smallest number from the given two numbers.

In [33]:
```
smallest = lambda x, y: x if x < y else y
num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))
result = smallest(num1, num2)
print(f"The smallest number is: {result}")
```

```
The smallest number is: 25.0
```

15) For the given list of names of students, extract the names having more that 7 characters. Use filter().

In [34]:
```
students = ["Alice", "Bob", "Alexander", "Catherine", "David", "Elizabeth"]
def has_more_than_7_chars(name):
    return len(name) > 7
filtered_names = list(filter(has_more_than_7_chars, students))
print("Names with more than 7 characters:", filtered_names)
```

```
Names with more than 7 characters: ['Alexander', 'Catherine', 'Elizabeth']
```

16) For the given list of names of students, convert the first letter of all the names into uppercase. use map().

In [35]:
```
students = ["alice", "bob", "alexander", "catherine", "david", "elizabeth"]
def capitalize_first_letter(name):
    return name.capitalize()
capitalized_names = list(map(capitalize_first_letter, students))
print("Names with first letter capitalized:", capitalized_names)
```

```
Names with first letter capitalized: ['Alice', 'Bob', 'Alexander', 'Catherine', 'Dav
id', 'Elizabeth']
```

17) Write udfs to call the functions with following types of arguments:

1. Positional Arguments
2. Keyword Arguments
3. Default Arguments
4. Variable Legngth Positional(*args) & variable length Keyword Arguments (*kwargs)
5. Keyword-Only & Positional Only Arguments

In [1]:
```
def positional_args(a, b):
    return a + b

def keyword_args(a, b):
    return a - b

def default_args(a, b=5):
    return a * b

def variable_length_positional(*args):
    return sum(args)

def variable_length_keyword(**kwargs):
    return kwargs

def keyword_only_args(*, a, b):
    return a + b

def positional_only_args(a, b, /):
    return a * b

print("Positional Arguments Result:", positional_args(10, 20))
print("Keyword Arguments Result:", keyword_args(b=20, a=10))
print("Default Arguments Result:", default_args(10))
print("Variable-Length Positional Arguments Result:", variable_length_positional(1,
print("Variable-Length Keyword Arguments Result:", variable_length_keyword(name="Al
print("Keyword-Only Arguments Result:", keyword_only_args(a=10, b=20))
print("Positional-Only Arguments Result:", positional_only_args(10, 20))
```

```
Positional Arguments Result: 30
Keyword Arguments Result: -10
Default Arguments Result: 50
Variable-Length Positional Arguments Result: 15
Variable-Length Keyword Arguments Result: {'name': 'Alice', 'age': 25, 'city': 'New
York'}
Keyword-Only Arguments Result: 30
Positional-Only Arguments Result: 200
```

In [ ]: