## Advanced Programming Practice Assignment 10

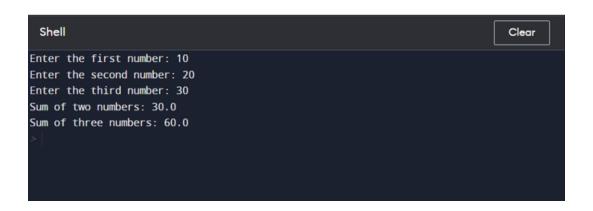
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1.Write a python program to calculate the sum of Two numbers and Three numbers. However, if the sum is between 120 to 320 it will return 200.

```
def sum_two_num(num1, num2):
  return num1 + num2
def sum three num(num1, num2, num3):
  return num1 + num2 + num3
def sumrange(sum result):
 if 120 <= sum_result <= 320:
    return 200
  else:
    return sum result
# Input two numbers
num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))
# Calculate the sum of two numbers
result_twonum = sum_two_num(num1, num2)
# Input three numbers
num3 = float(input("Enter the third number: "))
# Calculate the sum of three numbers
result threenum = sum three num(num1, num2, num3)
```

```
# Check if the sum is within the specified range
final_result_twonum= sumrange(result_twonum)
final_result_threenum = sumrange(result_threenum)

# Print the results
print(f"Sum of two numbers: {final_result_twonum}")
print(f"Sum of three numbers: {final_result_threenum}")
```



2. Implement a python function to find the Maximum of Three numbers.

def maxofnum(num1, num2, num3):

# Using the built-in max() function to find the maximum

maximum = max(num1, num2, num3)

return maximum

# Input three numbers from the user

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

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

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

# Call the function to find the maximum

maximum = maxofnum(num1, num2, num3)

# Display the maximum number

```
Enter the first number: 20
Enter the second number: 25
Enter the third number: 45
The maximum number among 20.0, 25.0, and 45.0 is: 45.0
```

print(f"The maximum number among {num1}, {num2}, and {num3} is:

{maximum}")

3. Write a python program to calculate the Factorial of a given number. def factorial(n): if n < 0: return "Factorial is not defined for negative numbers" elif n == 0: return 1 else: result = 1for i in range(1, n + 1): result \*= i return result # Input a number from the user num = int(input("Enter a non-negative integer : ")) # Calculate the factorial result = factorial(num) # Display the result if type(result) == int: print(f"The factorial of {num} is {result}.") else: print(result) Shell Clear Enter a non-negative integer : 5 The factorial of 5 is 120.

4. Write a python program to Check if a Number is Even or Odd and also check whether it is Prime or not.

def is\_even(number):

```
return number % 2 == 0
def is_prime(number):
  if number <= 1:
    return False
  if number <= 3:
    return True
  if number % 2 == 0 or number % 3 == 0:
    return False
  i = 5
  while i * i <= number:
    if number % i == 0 or number % (i + 2) == 0:
      return False
    i += 6
  return True
# Input a number from the user
num = int(input("Enter a positive integer: "))
# Check if it's even or odd
```

if is\_even(num):

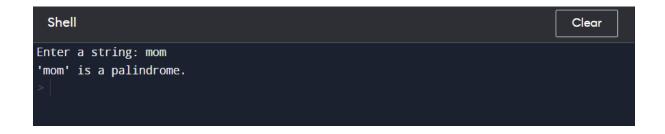
```
print(f"{num} is even.")
else:
    print(f"{num} is odd.")

# Check if it's prime or not
if is_prime(num):
    print(f"{num} is a prime number.")
else:
    print(f"{num} is not a prime number.")
```

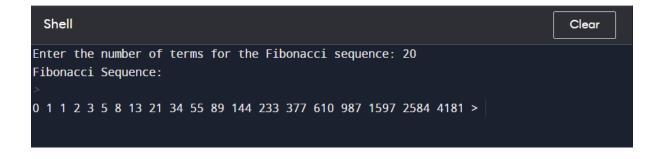


5. Implement a python function to Reverse a given String and also check for palindromeor not.

```
def reverse_and_check_palindrome(input_str):
  # Remove spaces and convert to lowercase for a case-insensitive check
  clean_str = input_str.replace(" ", "").lower()
  reversed_str = clean_str[::-1]
  return reversed_str == clean_str
# Input a string
user input = input("Enter a string: ")
# Call the function to check for palindrome
is_palindrome = reverse_and_check_palindrome(user_input)
# Display the results
if is_palindrome:
  print(f"'{user_input}' is a palindrome.")
else:
  print(f"'{user_input}' is not a palindrome.")
```



```
6. Write a python program to Generate Fibonacci Sequence.
def fibonacci(n):
  fibonacci_sequence = []
  a, b = 0, 1
  for _ in range(n):
    fibonacci sequence.append(a)
    a, b = b, a + b
  return fibonacci_sequence
# Input the number of terms
num terms = int(input("Enter the number of terms for the Fibonacci sequence:
"))
# Generate the Fibonacci sequence
fib sequence = fibonacci(num terms)
# Display the sequence
print("Fibonacci Sequence:")
for num in fib_sequence:
  print(num, end=" ")
```



geometric shapes (circle, rectangle, triangle, etc.). import math # Function to calculate the area and perimeter of a circle def circle area and perimeter(radius): area = math.pi \* radius\*\*2 perimeter = 2 \* math.pi \* radius return area, perimeter # Function to calculate the area and perimeter of a rectangle def rectangle\_area\_and\_perimeter(length, width): area = length \* width perimeter = 2 \* (length + width) return area, perimeter # Function to calculate the area and perimeter of a triangle def triangle area and perimeter(base, height, side1, side2, side3): if side1 + side2 > side3 and side1 + side3 > side2 and side2 + side3 > side1: s = (base + side1 + side2 + side3) / 2area = math.sqrt(s \* (s - base) \* (s - side1) \* (s - side2) \* (s - side3) ) perimeter = base + side1 + side2 + side3 return area, perimeter else: return "Invalid triangle. The provided side lengths cannot form a triangle."

7. Write a python program to calculate the area and perimeter of different

```
# Menu to select a shape
print("Select a geometric shape:")
print("1. Circle")
print("2. Rectangle")
print("3. Triangle")
choice = int(input("Enter your choice (1/2/3): "))
if choice == 1:
  radius = float(input("Radius of the circle: "))
  area, perimeter = circle_area_and_perimeter(radius)
  print(f"Area of the circle: {area}")
  print(f"Perimeter of the circle: {perimeter}")
elif choice == 2:
  length = float(input("Length of the rectangle: "))
  width = float(input("Width of the rectangle: "))
  area, perimeter = rectangle area and perimeter(length, width)
  print(f"Area of the rectangle: {area}")
  print(f"Perimeter of the rectangle: {perimeter}")
elif choice == 3:
  base = float(input("Enter the base of the triangle: "))
  height = float(input("Enter the height of the triangle: "))
  side1 = float(input("Length of side 1: "))
  side2 = float(input("Length of side 2: "))
  side3 = float(input("Length of side 3: "))
  result = triangle area and perimeter(base, height, side1, side2, side3)
  if isinstance(result, tuple):
```

```
area, perimeter = result

print(f"Area of the triangle: {area}")

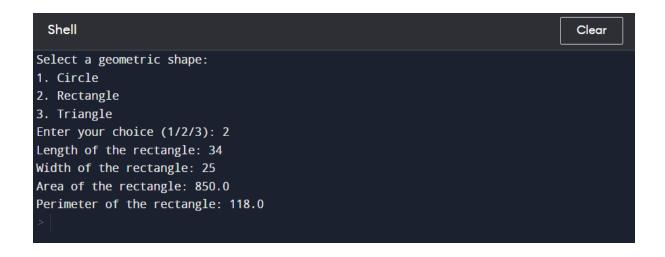
print(f"Perimeter of the triangle: {perimeter}")

else:

print(result)

else:

print("Invalid choice. Please select a valid option (1/2/3).")
```



8. Implement a python function to Convert Celsius to Fahrenheit and Fahrenheit to Celsius.

```
def temperature converter(temp, scale):
  if scale == "C":
    fahrenheit = (temp * 9/5) + 32
    return fahrenheit, "F"
  elif scale == "F":
    celsius = (temp - 32) * 5/9
    return celsius, "C"
  else:
    return "Invalid scale. Please use 'C' for Celsius or 'F' for Fahrenheit."
# Input temperature and scale from the user
temp = float(input("Enter the temperature: "))
scale = input("Enter the scale (C for Celsius, F for Fahrenheit): ").upper()
result, target_scale = temperature_converter(temp, scale)
if target scale == "F":
  print(f"{temp} degrees {scale} is equal to {result} degrees Fahrenheit.")
else:
  print(f"{temp} degrees {scale} is equal to {result} degrees Celsius.")
  Shell
                                                                           Clear
Enter the temperature: 45
Enter the scale (C for Celsius, F for Fahrenheit): C
45.0 degrees C is equal to 113.0 degrees Fahrenheit.
```

9. Write a Python program that accepts a string and counts the number of upper and lower case letters.

```
def count(input string):
  upper_count = 0
  lower_count = 0
  for char in input_string:
    if char.isupper():
      upper_count += 1
    elif char.islower():
      lower count += 1
  return upper_count, lower_count
# Input a string
user_input = input("Enter a string: ")
# Call the function to count upper and lower case letters
upper_count, lower_count = count(user_input)
# Display the results
print(f"Number of uppercase letters: {upper_count}")
print(f"Number of lowercase letters: {lower count}")
```

```
Shell

Enter a string: AdyaSingh

Number of uppercase letters: 2

Number of lowercase letters: 7

>
```

```
Numbers.
# Input complex numbers from the user
real part1 = float(input("Enter the real part of the first complex number: "))
imaginary_part1 = float(input("Enter the imaginary part of the first complex
number: "))
complex num1 = complex(real part1, imaginary part1)
real part2 = float(input("Enter the real part of the second complex number: "))
imaginary part2 = float(input("Enter the imaginary part of the second complex
number: "))
complex num2 = complex(real part2, imaginary part2)
# Arithmetic operations on complex numbers
addition_result = complex_num1 + complex_num2
subtraction result = complex num1 - complex num2
multiplication result = complex num1 * complex num2
division result = complex num1 / complex num2
# Display the results
print(f"Addition Result: {addition result}")
print(f"Subtraction Result: {subtraction result}")
print(f"Multiplication Result: {multiplication result}")
print(f"Division Result: {division result}")
```

10. Write a python program to perform Arithmetic operations on Complex

Enter the real part of the first complex number: 2
Enter the imaginary part of the first complex number: 3
Enter the real part of the second complex number: 3
Enter the imaginary part of the second complex number: 2
Addition Result: (5+5j)
Subtraction Result: (-1+1j)
Multiplication Result: 13j
Division Result: (0.9230769230769231+0.38461538464j)