Program4

January 3, 2025

1. Functions are often used to validate input. Write a function that accepts a single integer as a parameter and returns True if the integer is in the range 0 to 10 (inclusive), or False otherwise. Write a short program to test the function.

[3]:
```
def num_range(num):
    if 0<=num<=100:
        return True
    else:
        return False

test_numbers = [30,799,-120,100]
for value in test_numbers:
    result = num_range(value)
    print(f"Is {value} in range 0 to 100? {result}")
```

```
Is 30 in range 0 to 100? True
Is 799 in range 0 to 100? False
Is -120 in range 0 to 100? False
Is 100 in range 0 to 100? True
```

2. Write a function that has a single string as its parameter, and returns the number of uppercase letters, and the number of lowercase letters in the string. Test th function with a short program.

[8]:
```
def string_casing(s):
    upperCase = 0
    lowerCase = 0

    for char in s:
        if char.isupper():
            upperCase += 1
        elif char.islower():
            lowerCase +=1
    return upperCase, lowerCase

string_test = input("Enter the text you want to count the casing for: ")

Upcase, lowcase = string_casing(string_test)
print(f"String: '{string_test}'")
```

```
print(f"Uppercase letters: {Upcase}, Lowercase letters: {lowcase}\n")
```

```
Enter the text you want to count the casing for:  PneuMoNiA

String: 'PneuMoNiA'
Uppercase letters: 4, Lowercase letters: 5
```

3. Modify your "greetings" program so that the first letter of the name entered is always in uppercase with the rest in lowercase. This should happen even if the user entered their name differently. So if the user entered arthur, ARTHUR, or even arTHur the name should be displayed as Arthur.

[10]:
```
name = input("Your name: ")
modify_name = name.capitalize()

print(f"Greetings! {modify_name}")
```

```
Your name:  naLINI

Greetings! Nalini
```

4. When processing data it is often useful to remove the last character from some input (it is often a newline). Write and test a function that takes a string parameter and returns it with the last character removed. (If the string contains one or fewer characters, return it unchanged.)

[14]:
```
def string_manipulation(s):
    if len(s) >1:
        return s[:-1]
    else:
        return s

remove_last_char = input("Enter a word: ")
string_manipulation(remove_last_char)
```

```
Enter a word:  heaven
```

[14]:
```
'heave'
```

5. Write and test a function that converts a temperature measured in degrees centigrade into the equivalent in Fahrenheit, and another that does the reverse conversion. Test both functions. (Google will find you the formulae).

[20]:
```
def cel_to_fah(celsius):
    fahrenheit = celsius*(9/5) +32
    return fahrenheit

def fah_to_cel(fahr):
    cels = (fahr-32) * 5/9
    return cels
```

```
temp_in_celsius = float(input("Enter temperature in celsius: "))
print(f"{temp_in_celsius}C is equivalent to {cel_to_fah(temp_in_celsius)}F")

temp_in_fahrenheit =float(input("Enter temperature in fahrenheit: "))
print(f"{temp_in_fahrenheit}F is equivalent to␣
 ↪{fah_to_cel(temp_in_fahrenheit)}C")
```

```
Enter temperature in celsius:  36.4

36.4C is equivalent to 97.52F

Enter temperature in fahrenheit:  94.2

94.2F is equivalent to 34.55555555555556C
```

6. Write a program that takes a centigrade temperature and displays the equivalent in fahrenheit. The input should be a number followed by a letter C. The output should be in the same format.

[1]:
```
def celsius_to_fahrenheit(celsius: float) -> float:
    return (celsius * 9 / 5) + 32


input_temp = input("Enter temperature in Celsius (e.g., 25C): ").strip()

if input_temp[-1].upper() == 'C' and input_temp[:-1].replace('.', '', 1).
 ↪isdigit():
    celsius = float(input_temp[:-1])
    fahrenheit = celsius_to_fahrenheit(celsius)
    print(f"{fahrenheit:.2f}F")

else:
    print("Invalid input. Please enter the temperature in the format 'XXC'.")
```

```
Enter temperature in Celsius (e.g., 25C):  34C

93.20F
```

7. Write a program that reads 6 temperatures (in the same format as before), and displays the maximum, minimum, and mean of the values. Hint: You should know there are built-in functions for max and min. If you hunt, you might also find one for the mean.

[22]:
```
def celsius_to_fahrenheit(celsius: float) -> float:
    return (celsius * 9 / 5) + 32

fahrenheit_temps = []

for i in range(6):
    input_temp = input(f"Enter temperature {i+1} in Celsius (e.g., 25C): ").
 ↪strip()
```

```
    if input_temp[-1].upper() == 'C' and input_temp[:-1].replace('.', '', 1).
 ↪isdigit():
        celsius = float(input_temp[:-1])

        fahrenheit = celsius_to_fahrenheit(celsius)
        fahrenheit_temps.append(fahrenheit)
    else:
        print("Invalid input. Please enter the temperature in the format 'XXC'.
 ↪")
        return

max_temp = max(fahrenheit_temps)
min_temp = min(fahrenheit_temps)
mean_temp = sum(fahrenheit_temps) / len(fahrenheit_temps)

print(f"Maximum Temperature: {max_temp:.2f}F")
print(f"Minimum Temperature: {min_temp:.2f}F")
print(f"Mean Temperature: {mean_temp:.2f}F")
```

```
Enter temperature 1 in Celsius (e.g., 25C):  25.5C
Enter temperature 2 in Celsius (e.g., 25C):  34.5c
Enter temperature 3 in Celsius (e.g., 25C):  16C
Enter temperature 4 in Celsius (e.g., 25C):  2C
Enter temperature 5 in Celsius (e.g., 25C):  45C
Enter temperature 6 in Celsius (e.g., 25C):  37C

Maximum Temperature: 113.00F
Minimum Temperature: 35.60F
Mean Temperature: 80.00F
```

8. Modify the previous program so that it can process any number of values. The input terminates when the user just pressed "Enter" at the prompt rather than entering value.

[2]:
```
def celsius_to_fahrenheit(celsius: float) -> float:
    return (celsius * 9 / 5) + 32

fahrenheit_temps = []

while True:
    input_temp = input("Enter temperature in Celsius (e.g., 25C) or press Enter␣
 ↪for result: ").strip()
    if input_temp == "":
        break

    if input_temp[-1].upper() == 'C' and input_temp[:-1].replace('.', '', 1).
 ↪isdigit():
        celsius = float(input_temp[:-1])
```

```
        fahrenheit = celsius_to_fahrenheit(celsius)
        fahrenheit_temps.append(fahrenheit)
    else:
        print("Invalid input. Please enter the temperature in the format 'XXC'.
 ↪")

if fahrenheit_temps:
    max_temp = max(fahrenheit_temps)
    min_temp = min(fahrenheit_temps)
    mean_temp = sum(fahrenheit_temps) / len(fahrenheit_temps)

    print(f"Maximum Temperature: {max_temp:.2f}F")
    print(f"Minimum Temperature: {min_temp:.2f}F")
    print(f"Mean Temperature: {mean_temp:.2f}F")
else:
    print("No valid temperatures were entered.")
```

```
Enter temperature in Celsius (e.g., 25C) or press Enter for result:  32C
Enter temperature in Celsius (e.g., 25C) or press Enter for result:  45C
Enter temperature in Celsius (e.g., 25C) or press Enter for result:

Maximum Temperature: 113.00F
Minimum Temperature: 89.60F
Mean Temperature: 101.30F
```

[ ]: