

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 100 (inclusive), or False otherwise. Write a short program to test the function.

```
Code:
def help():
    count=int(input("Enter any parameter: "))
    if count in range(0,101):
        print("True")
    else:
        print("False")
help()
```

```
Output:
Enter any parameter: 101
False
```

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 the function with a short program.

```
Code:
def single_string():
    s = input("Enter a string: ")
    uppercase = sum(1 for c in s if c.isupper())
    lowercase = sum(1 for c in s if c.islower())
    return uppercase, lowercase
print(single_string())
```

```
Output:
Enter a string: Apeal Babu
(2, 7)
```

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.

```
Code:
def greeting():
    my_name=input("Hello, What is your name? ")
    my_name = my_name.capitalize()
    if my_name=="":
```

```
print("Hello Stranger!")
else:
    print(f"Hello, {my_name}. Good to meet you! ")
greeting()
```

Output:

```
Hello, What is your name? ApEaL
Hello, Apeal. Good to meet you!
```

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.)

Code:

```
def remove_last_char(s):

    if len(s) > 1:
        return s[:-1]
    return s

# Test cases
def test_remove_last_char():
    print(remove_last_char("hello")) # Expected: "hell"
    print(remove_last_char("a"))    # Expected: "a"
    print(remove_last_char(""))     # Expected: ""
    print(remove_last_char("!"))    # Expected: "!"
    print(remove_last_char("test\n")) # Expected: "test"

test_remove_last_char()
```

Output:

```
hell
a
!
test
```

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)

Code:

```
def centi_fah(centi):
    return (centi * (9/5)) + 32
```

```

def fah_cent(fah):
    return (fah - 32)*(5/9)

def main():
    choice=input("Choose one option (1. For Centigrade to Fahrenheit and 2. For Fahrenheit to Centigrade): ")

    if choice == "1":
        centi=float(input("Enter the centigrade: "))
        c_f = centi_fah(centi)
        print(f"{centi}°C is equivalent to {c_f}°F")

    elif choice == "2":
        fah=float(input("Enter the Fahrenheit: "))
        f_c = fah_cent(fah)
        print(f"{fah}°F is equivalent to {f_c:.2f}°C")

    else:
        print("Invalid Choice")
main()

```

#### Output:

```

Choose one option (1. For Centigrade to Fahrenheit and 2. For Fahrenheit to Centigrade): 1
Enter the centigrade: 32.5
32.5°C is equivalent to 90.5°F

```

*Figure 1: When user choose option 1*

```

Choose one option (1. For Centigrade to Fahrenheit and 2. For Fahrenheit to Centigrade): 2
Enter the Fahrenheit: 90.5
90.5°F is equivalent to 32.50°C

```

*Figure 2: When user choose option 2*

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.

#### Code:

```

def celsius_to_fahrenheit(temp_c):

    if not temp_c.endswith("C"):
        raise ValueError("Input must end with 'C'.")

    try:
        celsius = float(temp_c[:-1]) # Extract the numeric part
        fahrenheit = (celsius * 9/5) + 32
        return f"{fahrenheit:.2f}°F" # Format output with 2 decimal places
    except ValueError:

```

```
raise ValueError("Invalid numeric input.")

def main():
    input_temp = input("Enter temperature in Celsius (e.g., 25C): ").strip()
    try:
        result = celsius_to_fahrenheit(input_temp)
        print(f"Equivalent Fahrenheit temperature: {result}")
    except ValueError as e:
        print(f"Error: {e}")

main()
```

Output:

```
Enter temperature in Celsius (e.g., 25C): 32.5C
Equivalent Fahrenheit temperature: 90.50F
```

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.

```
Code:
def user_temperatures():
    temperatures = []
    for i in range(6):
        temperature = float(input("Enter temperature {}: ".format(i + 1)))
        temperatures.append(temperature)
    return temperatures

def calculation_part(temperatures):
    max_temp = max(temperatures)
    min_temp = min(temperatures)
    mean_temp = sum(temperatures) / len(temperatures)
    return max_temp, min_temp, mean_temp

temperatures = user_temperatures()
max_temp, min_temp, mean_temp = calculation_part(temperatures)
print("Maximum temperature: {:.2f}°C".format(max_temp))
print("Minimum temperature: {:.2f}°C".format(min_temp))
print("Mean temperature: {:.2f}°C".format(mean_temp))
```

Output:

```
Enter temperature 1: 100
Enter temperature 2: 101
Enter temperature 3: 104
Enter temperature 4: 99
Enter temperature 5: 200
Enter temperature 6: 9
Maximum temperature: 200.00°C
Minimum temperature: 9.00°C
Mean temperature: 102.17°C
```

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 a value.

Code:

```
def user_temperatures():
    temperatures = []
    while True:
        try:
            temperature = input("Enter a temperature (or press Enter to finish): ")
            if temperature == "":
                break
            temperatures.append(float(temperature))
        except ValueError:
            print("Please enter a valid number.")
    return temperatures

def calculation_part(temperatures):
    if temperatures:
        max_temp = max(temperatures)
        min_temp = min(temperatures)
        mean_temp = sum(temperatures) / len(temperatures)
        return max_temp, min_temp, mean_temp
    else:
        return None, None, None

temperatures = user_temperatures()
if temperatures:
    max_temp, min_temp, mean_temp = calculation_part(temperatures)
    print("Maximum temperature: {:.2f}°C".format(max_temp))
    print("Minimum temperature: {:.2f}°C".format(min_temp))
    print("Mean temperature: {:.2f}°C".format(mean_temp))
else:
    print("No temperatures were entered.")
```

Output:

```
Enter a temperature (or press Enter to finish): 100
Enter a temperature (or press Enter to finish): 300
Enter a temperature (or press Enter to finish): 20
Enter a temperature (or press Enter to finish):
Maximum temperature: 300.00°C
Minimum temperature: 20.00°C
Mean temperature: 140.00°C
```