week4_programs

January 15, 2025

```
[3]: """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."""

     def func():
         num=user_input()
         if num in range(101):
             print("True")
         else:
             print("False")
     def user_input():
         num=int(input("Enter an integer number:"))
         return num
     func()
```

```
Enter an integer number: 111

False
```

```
[5]: """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."""

     def count_case():
         name=user_input()
         uppercase_count=0
         lowercase_count=0
         for char in name:
             if char.isupper():
                 uppercase_count+=1
             elif char.islower():
                 lowercase_count+=1
         return uppercase_count,lowercase_count
     def user_input():
         name=input("Enter your name:")
```

```
        return name
def display():
    uppercase_count, lowercase_count = count_case()
    print(f"Number of Uppercase letters found in your input is␣
 ↪{uppercase_count}.")
    print(f"Number of Lowercase letters found in your input is␣
 ↪{lowercase_count}.")

display()
```

Enter your name: FUNDAMENTAL Computing proGram

Number of Uppercase letters found in your input is 13.
Number of Lowercase letters found in your input is 14.

[6]:
```
"""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."""
def greetings():
    name=user_input()
    name=name.capitalize()
    print(f"Hello, {name}!")
def user_input():
    name=input("Enter your name:")
    return name
greetings()
```

Enter your name: arTHur

Hello, Arthur!

[15]:
```
"""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.)"""
def char_remove(name):
    if len(name) <= 1:
        return name
    else:
        return name[:-1]
def user_input():
    return input("Enter your name: ")
```

```python
def display():
    name = user_input()
    modified_name = char_remove(name)
    if len(name) <= 1:
        print(f"Your input '{name}' remained unchanged due to its shortness.")
    else:
        print(f"Modified name: {modified_name}")

display()
```

Enter your name: s

Your input 's' remained unchanged due to its shortness.

[4]:
```python
"""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)."""


def celsius_to_fahrenheit():
    celsius = user_input()
    fahrenheit = (celsius * 9 / 5) + 32
    return fahrenheit

def user_input():
    celsius = float(input("Enter the temperature measured in degrees centigrade:
    ↪"))
    return celsius

def fahrenheit_temp():
    fahrenheit = celsius_to_fahrenheit()
    print(f"The temperature in Celsius is equivalent to {fahrenheit:.2f}°F.")

fahrenheit_temp()

def fahrenheit_to_celsius():
    fahrenheit = user_second_input()
    celsius = (fahrenheit - 32) * 5 / 9
    return celsius
def user_second_input():
    fahrenheit = float(input("Enter the temperature measured in Fahrenheit
    ↪degree:"))
    return fahrenheit
def celsius_temp():
    celsius = fahrenheit_to_celsius()
    print(f"The temperature in Fahrenheit is equivalent to {celsius:.2f}°C.")

celsius_temp()
```

Enter the temperature measured in degrees centigrade: 22

The temperature in Celsius is equivalent to 71.60°F.

Enter the temperature measured in Fahrenheit degree: 71

The temperature in Fahrenheit is equivalent to 21.67°C.

[19]:
```python
"""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."""
def get_temperature_input():
    while True:
        temp_input = input("Enter the temperature in Celsius (e.g., 22C): ")
        if temp_input[-1].upper() == 'C' and temp_input[:-1].strip():
            return temp_input
        else:
            print("Invalid input. Please enter a valid temperature ending with
 ↪'C'.")

def convert_celsius_to_fahrenheit(celsius):
    return (celsius * 9/5) + 32

def extract_celsius_value(temp_input):
    return float(temp_input[:-1])

def display_conversion(celsius, fahrenheit):
    print(f"The temperature {celsius}°C is equivalent to {fahrenheit:.2f}°F.")

def main():
    temp_input = get_temperature_input()
    celsius_value = extract_celsius_value(temp_input)
    fahrenheit_value = convert_celsius_to_fahrenheit(celsius_value)
    display_conversion(celsius_value, fahrenheit_value)
main()
```

Enter the temperature in Celsius (e.g., 22C): 22

Invalid input. Please enter a valid temperature ending with 'C'.

Enter the temperature in Celsius (e.g., 22C): 22 c

The temperature 22.0°C is equivalent to 71.60°F.

[10]:
```python
"""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."""
```

```python
import statistics

def celsius_to_fahrenheit(celsius):
    return (celsius * 9/5) + 32

def user_input():
    fahrenheit_temperatures = []
    for i in range(6):
        temp_input = input("Enter the temperature in Celsius (e.g., 22C): ")
        celsius_value = float(temp_input[:-1])
        fahrenheit_temperatures.append(celsius_to_fahrenheit(celsius_value))
    return fahrenheit_temperatures

def display(fahrenheit_temperatures):
    max_temp = max(fahrenheit_temperatures)
    min_temp = min(fahrenheit_temperatures)
    mean_temp = statistics.mean(fahrenheit_temperatures)

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

def main():
    fahrenheit_temperatures = user_input()
    display(fahrenheit_temperatures)
main()
```

```
Enter the temperature in Celsius (e.g., 22C):  22
Enter the temperature in Celsius (e.g., 22C):  22d
Enter the temperature in Celsius (e.g., 22C):  11e
Enter the temperature in Celsius (e.g., 22C):  22w
Enter the temperature in Celsius (e.g., 22C):  11
Enter the temperature in Celsius (e.g., 22C):  22e

Maximum Temperature: 71.60F
Minimum Temperature: 33.80F
Mean Temperature: 56.00F
```

[5]:
```python
"""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."""
import statistics

def celsius_to_fahrenheit(celsius):
    return (celsius * 9 / 5) + 32
```

```python
def user_input():
    fahrenheit_temperatures = []
    while True:
        temp_input = input("Enter the temperature in Celsius (e.g., 22C or␣
 ↪press Enter to finish): ")
        if not temp_input:
            break
        try:
            celsius_value = float(temp_input[:-1])
            fahrenheit_temperatures.append(celsius_to_fahrenheit(celsius_value))
        except ValueError:
            print("Invalid input. Please enter a valid temperature (e.g., 22C).
 ↪")
    return fahrenheit_temperatures

def display(fahrenheit_temperatures):
    if not fahrenheit_temperatures:
        print("No temperatures were entered.")
        return

    max_temp = max(fahrenheit_temperatures)
    min_temp = min(fahrenheit_temperatures)
    mean_temp = statistics.mean(fahrenheit_temperatures)

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

def main():
    fahrenheit_temperatures = user_input()
    display(fahrenheit_temperatures)

main()
```

Enter the temperature in Celsius (e.g., 22C or press Enter to finish): 2

Invalid input. Please enter a valid temperature (e.g., 22C).

Enter the temperature in Celsius (e.g., 22C or press Enter to finish): 22C
Enter the temperature in Celsius (e.g., 22C or press Enter to finish):

Maximum Temperature: 71.60F
Minimum Temperature: 71.60F
Mean Temperature: 71.60F

[ ]: