Week 2 Assignment

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Tutorial Questions.

Question 1 : Describe the concept of variables in python and provide an example on how to assign a value to variable.

Answer : A variable in Python is a symbolic name that represents a value stored in the computer's memory. It acts as a reference to the value, allowing you to manipulate and use the data in your program.
Example :

```
age = 10
name = "Drishti Telgu"
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9]
height = 5.5
is_student = True


print("Age:", age)
print("Name:", name)
print("Numbers:", numbers)
print("Height:", height)
print("Is Student:", is_student)


new_age = age + 9
print("New Age after adding 5:", new_age)

greeting = "Hello, " + name
print(greeting)
```

Output for example :
C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\Variables.py
Age: 10
Name: Drishti Telgu
Numbers: [1, 2, 3, 4, 5, 6, 7, 8, 9]

Height: 5.5
Is Student: True
New Age after adding 5: 19
Hello, Drishti Telgu

Process finished with exit code 0

Question 2 : Explain the difference between integer and float data types in python and provide an example of how to convert between them.

Answer :

Difference between integer and float :

Integer	Float
1. Integer are whole number without decimal (fractional component).	1. Float are numbers that have decimal points.
2. Example : -4, 0, 15	2. Example : 4.15, -0.001, 3.5
3. Integers can be limited by the available memory.	3. Floats are implemented as 64 bits in Python.

Examples :

1. Integer to float

```
num_int = 15
num_float = float(num_int)
print(num_float)
```

Output:
C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\int_floar.py
15.0

Process finished with exit code 0

2. Float to Integer

```
num_float = 4.5
num_int = int(num_float)
```

```
print(num_int)
```

Output:
C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\float_int.py
4

Process finished with exit code 0

Question 3 :
What is the use of len() function in python, and how is it used? Provide an example.

Answer :
In Python, the `len()` function is used to determine the length of an object.

- For Sequence like string :

```
string = "Hello, World!"
length = len(string)
print(length)
```

Output :
C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\stirng_len.py
13

Process finished with exit code 0

- For sequence like list :

```
my_list = [1, 2, 3, 4, 5]
length = len(my_list)
print(length)
```

Output :
C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\list_len.py
5

Process finished with exit code 0

- For sequence like tuple :

```
my_tuple = ('a', 'b', 'c', 'd')
length = len(my_tuple)
print(length)
```

Output :
C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\tuple_len.py
4

Process finished with exit code 0

- For Collection like set :

```
my_set = {1, 2, 3, 4, 5}
length = len(my_set)
print(length)
```

Output :
C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\set_len.py
5

Process finished with exit code 0

- For collection like dictionaries :

```
my_dict = {'a': 1, 'b': 2, 'c': 3}
length = len(my_dict)
print(length)
```

Output :
C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\Dictioneries_len.py
3

Process finished with exit code 0

Question 4 : What is a boolean data type in python, and what are some common boolean operators used with it? Provide it example.
Answer :
In Python, the Boolean data type represents truth values, which are either `True` or `False`. Python provides several operators that can be used with Boolean values to perform logical operations:

1. AND ,OR, NOT operators.
   Example:

```
x = True
y = False
```

```
result = x and y
print(result)

x = True
y = False

result = x or y
print(result)

x = True

result = not x
print(result)
```

Output :

C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\Boolean_operators.py
False
True
False

Process finished with exit code 0

2. Comparison Operators are ==, !=, >, <, >=, <=
   Example :

```
a = 7
b = 13

print(a == b)
print(a != b)
print(a > b)
print(a < b)
print(a >= b)
print(a <= b)
```

Output :

C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\comparison_operators.py

False

True

False

True

False

True

Process finished with exit code 0

Question 5 : What is tuple data type in python, and how is it different from list? Provide an example on how to create a tuple in python.

Answer :

Tuples maintain the order of elements as they are defined.Once a tuple is created, you cannot change, add, or remove elements from it.

Difference between tuple and list.

Tuple	List
1. Tuple is immutable.	1. Lists are mutable.
2. Tuples are defined using parentheses ()	2. Lists are defined using square brackets []
3. Tuples are faster in indexing and iteration.	3. Lists are slower in indexing and iteration than tuple.

Example :

```
my_tuple = (1, 2, 3, 4, 5)

print(my_tuple)

print(my_tuple[0])

print(my_tuple[2])
```

```
mixed_tuple = (1, 'Hello', 3.5, True)

print(mixed_tuple)
```

Output :

C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\tuple.py

(1, 2, 3, 4, 5)

1

3

(1, 'Hello', 3.5, True)

Process finished with exit code 0

Tutorial Practical.

Write a python programme to convert a temperature value from fahrenheit to celsius. The programme should follow these steps : Prompt the value in fahrenheit. This Input should be captured and stored in variables. Make sure to convert this input into the correct numerical type for calculations. Convert the captured fahrenheit temperature value to celsius using the formula: (fahrenheit-32)* 5/9. Store this result in a new variable. Finally, output the calculated celsius value to the console using the print() function. Ensure the output is clear and easily understandable to the user. Additional points will be awarded for appropriate variable names, clear code comments, and efficient use of functions.

Answer :

```
def fahrenheit_to_celsius(fahrenheit):
    """
    Convert temperature from Fahrenheit to Celsius.

    Parameters:
```

```
    - fahrenheit: A float representing the temperature in Fahrenheit

    Returns:
    - celsius: A float representing the temperature converted to Celsius
    """
    celsius = (fahrenheit - 32) * 5 / 9
    return celsius


def celsius_to_fahrenheit(celsius):
    """
    Convert temperature from Celsius to Fahrenheit.

    Parameters:
    - celsius: A float representing the temperature in Celsius

    Returns:
    - fahrenheit: A float representing the temperature converted to
Fahrenheit
    """
    fahrenheit = celsius * 9 / 5 + 32
    return fahrenheit


def main():
    print("Hello! Welcome to the temperature conversion program.")
```

```
   print("Please select the conversion you want to perform:")

   print("1. Fahrenheit to Celsius")

   print("2. Celsius to Fahrenheit")

   choice = input("Enter your choice (1 or 2): ")



   if choice == '1':



       fahrenheit_str = input("Enter the temperature in Fahrenheit: ")

       if fahrenheit_str.replace('.', '', 1).isdigit():

           fahrenheit = float(fahrenheit_str)

           celsius = fahrenheit_to_celsius(fahrenheit)

           print(f"{fahrenheit} degrees Fahrenheit is equal to
{celsius:.2f} degrees Celsius.")

       else:

           print("Error: Please enter a valid numeric value for
temperature.")



   elif choice == '2':



       celsius_str = input("Enter the temperature in Celsius: ")

       if celsius_str.replace('.', '', 1).isdigit():

           celsius = float(celsius_str)

           fahrenheit = celsius_to_fahrenheit(celsius)

           print(f"{celsius} degrees Celsius is equal to {fahrenheit:.2f}
degrees Fahrenheit.")

       else:

           print("Error: Please enter a valid numeric value for
temperature.")
```

```
    else:
        print("Invalid choice. Please enter 1 or 2.")



if __name__ == "__main__":
    main()
```

Output :

C:\Users\61411\PycharmProjects\pythonProject\.venv\Scripts\python.exe
C:\Users\61411\PycharmProjects\pythonProject\.venv\far_celsius.py

Hello! Welcome to the temperature conversion program.

Please select the conversion you want to perform:

1. Fahrenheit to Celsius

2. Celsius to Fahrenheit

Enter your choice (1 or 2): 2

Enter the temperature in Celsius: 78

78.0 degrees Celsius is equal to 172.40 degrees Fahrenheit.

Process finished with exit code 0