Task 01: Variables and Data Types

- Part (a)

```
In [2]: # Storing age as an integer
        age = 23

        # Storing name as a string
        name = "AZMIYA"

        # Checking if you are a student using a Boolean variable
        student = True

        # Printing the variables
        print("Name:", name)
        print("Age:", age)
        print("Student:", student)
```

```
Name: AZMIYA
Age: 23
Student: True
```

- Part (b)

```
In [3]: # Adding 25 to age
        age = age + 25

        # Concatenating name with "Smith."
        name = name + " Smith."

        # Negating the Boolean variable
        student = not student

        # Printing the updated variables
        print("Updated Age:", age)
        print("Updated Name:", name)
        print("Updated Student:", student)
```

```
Updated Age: 48
Updated Name: AZMIYA Smith.
Updated Student: False
```

Task 2: Expressions and Operators

- Part(a)

```
In [4]: # Store the width and height of the rectangle in variables
        width = 5.5
        height = 3.25

        # Calculate the area of the rectangle
```

```python
area = width * height

# Print the area
print("The area of the rectangle is:", area, "square units")
```

```
The area of the rectangle is: 17.875 square units
```

- Part(b)

In [5]:
```python
# Temperature in Celsius
celsius_temperature = 25.0

# Convert the temperature to Fahrenheit
fahrenheit_temperature = (celsius_temperature * 9/5) + 32

# Print the temperature in Fahrenheit
print("Temperature in Fahrenheit:", fahrenheit_temperature, "°F")
```

```
Temperature in Fahrenheit: 77.0 °F
```

- Part(c)

In [7]:
```python
# radius of the circle
radius = 5

#  area of the circle
pi = 3.14159
area = pi * radius**2

# Print the area of the circle
print("area of the circle :", area)
```

```
area of the circle : 78.53975
```

Task 3: Introduction to Data Structures

- Part (a)

In [8]:
```python
# creating a list
fruits = ["apple," "banana," "orange," "grape," "kiwi."]
print(fruits)
```

```
['apple,banana,orange,grape,kiwi.']
```

- Part (b)

In [10]:
```python
# creating a tuple
months =("January,"  "Feburary," "March" )
print(months)
```

```
January,Feburary,March
```

Task 4: List Manipulation

Part (a)

```python
In [2]:  # List of numbers
         numbers = [12, 34, 45, 67, 89, 100, 23, 56]

         # Calculate the sum of the numbers
         is_sum = sum(numbers)


         # Calculate the average
         average = is_sum / len(numbers)


         print("Sum of the numbers:", is_sum)
         print("Average of the numbers:", average)
```

```
Sum of the numbers: 426
Average of the numbers: 53.25
```

Part(b)

```python
In [3]:  fruits = ["apple", "banana", "orange", "grape", "kiwi"]

         # Remove the first and last elements
         fruits = fruits[1:-1]

         # Print the updated list
         print(fruits)
```

```
['banana', 'orange', 'grape']
```

Task 5: Dictionary Operations

Part(a)

```python
In [4]:  capitals = {
             "USA": "Washington D.C.",
             "France": "Paris",
             "Japan": "Tokyo"
         }

         # Print the dictionary
         print(capitals)
```

```
{'USA': 'Washington D.C.', 'France': 'Paris', 'Japan': 'Tokyo'}
```

Part(c)

```python
In [5]:  # Existing "capitals" dictionary
         capitals = {
             "USA": "Washington D.C.",
             "France": "Paris",
             "Japan": "Tokyo"
         }
```

```python
# Add a new country and its capital
capitals["Germany"] = "Berlin"

#  updated dictionary
print(capitals)
```

```
{'USA': 'Washington D.C.', 'France': 'Paris', 'Japan': 'Tokyo', 'Germany': 'Berlin'}
```

Part(c)

```python
In [6]:  # Existing "capitals" dictionary
         capitals = {
             "USA": "Washington D.C.",
             "France": "Paris",
             "Japan": "Tokyo"
         }

         # Check if "France" exists in the dictionary
         if "France" in capitals:
             print("France is in the dictionary.")
         else:
             print("France is not in the dictionary.")
```

```
France is in the dictionary.
```

Task 6: Comparison Operators, Logical Operators and If/Else:

Part(a)

```python
In [8]:  number = int(input("Enter a number :"))

         # Check if the number is even or odd
         if number % 2 == 0:
             print(number , "is an even number.")
         else:
             print(number, "is an odd number.")
```

```
Enter a number :6
6 is an even number.
```

Part (b)

```python
In [10]:  # Define the variables
          age = 16
          GPA = 3.0

          # Check eligibility for admission
          if age >= 18 and GPA >= 3.0:
              print("Eligible for admission")
          else:
              print("Not eligible for admission")
```

```
Not eligible for admission
```

Task 7: Advanced Data Types

Part (a)

```
In [13]:   fruits_set = {"apple", "banana", "orange", "grape", "kiwi"}

           # Print the set
           print(fruits_set)
```

{'apple', 'kiwi', 'orange', 'grape', 'banana'}

Part(b)

Union of set1 and set2.

```
In [16]:   set1 = {1, 2, 3, 4, 5}
           set2 = {3, 4, 5, 6, 7}

           # Perform the union of set1 and set2
           result = set1.union(set2)

           # Print the result
           print("Union of set1 and set2:",result)
```

Union of set1 and set2: {1, 2, 3, 4, 5, 6, 7}

Intersection of set1 and set2.

```
In [17]:   set1 = {1, 2, 3, 4, 5}
           set2 = {3, 4, 5, 6, 7}

           # intersection of set1 and set2
           result= set1.intersection(set2)

           # Print the result
           print("Intersection of set1 and set2:", result)
```

Intersection of set1 and set2: {3, 4, 5}

Difference between set1 and set2.

```
In [18]:   set1 = {1, 2, 3, 4, 5}
           set2 = {3, 4, 5, 6, 7}

           # Find the difference between set1 and set2
           result= set1.difference(set2)

           # Print the result
           print("Difference between set1 and set2:", result)
```

Difference between set1 and set2: {1, 2}

Check if set1 is a subset of set2.

```
In [19]:  set1 = {1, 2, 3}
          set2 = {1, 2, 3, 4, 5}

          # Check if set1 is a subset of set2
          is_subset = set1.issubset(set2)

          # Print the result
          if is_subset:
              print("set1 is a subset of set2")
          else:
              print("set1 is not a subset of set2")
```

set1 is a subset of set2

Task 8: Strings Manipulation

Part(a)

```
In [21]:  sentence = "Python programming is fun and powerful!"
          print(sentence)
```

Python programming is fun and powerful!

```
In [22]:  len(sentence)
```

Out[22]: 39

```
In [25]:  result = sentence.upper()
          print(result)
```

PYTHON PROGRAMMING IS FUN AND POWERFUL!

```
In [27]:  result = sentence.replace("fun","exciting")
          print(result)
```

Python programming is exciting and powerful!

```
In [28]:  sentence = "Python programming is fun and powerful!"

          if "Python" in sentence:
              print("The string contains the word 'Python'.")
          else:
              print("The string does not contain the word 'Python'.")
```

The string contains the word 'Python'.

```
In [29]:  sentence = "Python programming is fun and powerful!"


          word_list = sentence.split()

          print(word_list)
```

['Python', 'programming', 'is', 'fun', 'and', 'powerful!']