Artificial Intelligence & Machine Learning Lab

SUBMITTED TO   SUBMITTED BY

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                                                               Btech CSE DevOps B1

Lab 1

Q1. Write a Python program to perform basic arithmetic operations (addition, subtraction, multiplication, division, and modulus) on two numbers.

1. **Prompt the user to enter two numbers:**

```python
num1 = float(input("Enter the num 1: "))
num2 = float(input("Enter the num 2: "))
```

2. **Perform the arithmetic operations and print the results:**

```python
addition = num1 + num2
subtraction = num1 - num2
multiplication = num1 * num2
division = num1 / num2
modulus = num1 % num2

print(f"Addition: {num1} + {num2} = {addition}")
print(f"Subtraction: {num1} - {num2} = {subtraction}")
print(f"Multiplication: {num1} * {num2} = {multiplication}")
print(f"Division: {num1} / {num2} = {division}")
print(f"Modulus: {num1} % {num2} = {modulus}")
```

Example Output:

```
Enter the num 1: 5
Enter the num 2: 10
Addition: 5.0 + 10.0 = 15.0
Subtraction: 5.0 - 10.0 = -5.0
Multiplication: 5.0 * 10.0 = 50.0
Division: 5.0 / 10.0 = 0.5
Modulus: 5.0 % 10.0 = 5.0
```

Q2. Create variables of different data types (integer, float, string, boolean) and perform basic operations on them.

1. **Assign values to variables of different data types:**

```python
integer = 10
float_val = 50.0
string = "Hello"
boolean = True
```

2. **Perform arithmetic operations on numeric data types:**

```python
addition = integer + float_val
subtraction = integer - float_val
multiplication = integer * float_val
division = integer / float_val
modulus = integer % float_val

print(f"Addition: {integer} + {float_val} = {addition}")
print(f"Subtraction: {integer} - {float_val} = {subtraction}")
print(f"Multiplication: {integer} * {float_val} = {multiplication}")
```

```
print(f"Division: {integer} / {float_val} = {division}")
print(f"Modulus: {integer} % {float_val} = {modulus}")
```

3. **Concatenate strings using the + operator:**

```
concatenated_string = string + " World !!"
print(concatenated_string)
```

Example Output:

```
Hello World !!
```

4. **Use logical operators to evaluate boolean expressions:**

```
and_op = boolean and False
or_op = boolean or False
not_op = not boolean

print(and_op)   # False
print(or_op)    # True
print(not_op)   # False
```

Q3. Write a program to take user input, process it, and display the result.

1. **Prompt the user to enter their name:**

```
name = input("Enter your name here: ")
```

2. **Greet the user using their name:**

```
greet = f"Hello, {name}! Nice to meet you !!"
print(greet)
```

Example Output:

```
Enter your name here: stuvwxyz
Hello, stuvwxyz! Nice to meet you !!
```

3. **Calculate and print the user's age based on their birth year:**

```
dob = int(input("Enter your year of birth: "))
age = 2024 - dob
print(f"Currently your age is: {age}")
```

Example Output:

```
Enter your year of birth: 2005
Currently your age is: 19
```

Q4. Write a program to check if a number is even or odd.

1. **Prompt the user to enter a number:**

```
number = int(input("Enter the number you want to get checked: "))
```

2. **Use the modulus operator to determine if the number is even or odd:**

```
if number % 2 == 0:
    print("The number given is even.")
else:
    print("The number given is odd.")
```

Example Output:

```
Enter the number you want to get checked: 20
The number given is even.
```

Q5. Write a program to print the numbers from 1 to 10 using both for and while loops.

- **Using a for loop to iterate through a range of numbers:**

```
for i in range(1, 11):
    print(i)
```

Output:

```
1
2
3
4
5
6
7
8
9
10
```

- **Using a while loop with a counter variable:**

```
counter = 0
while counter < 11:
    print(counter)
    counter += 1
```

Output:

```
0
1
2
3
4
5
6
7
8
9
10
```

Printed the numbers from 1 to 10 using both while and for loops.

Q6. Create a list, access elements, modify elements, and perform list operations.

- **Create a list of fruits:**

```
fruits = ["Apple", "Banana", "Cherry", "Date", "Orange"]
print("Accessing elements using indexing:")
print(f"First fruit: {fruits[0]}")
print(f"Third fruit: {fruits[2]}")
print(f"Last fruit: {fruits[-1]}")
```

Output:

```
Accessing elements using indexing:
First fruit: Apple
Third fruit: Cherry
Last fruit: Orange
```

- **Access elements using indexing:**

```
fruits[1] = "Kiwies"
print(f"Modified list is: {fruits}")
```

Output:

```
Modified list is: ['Apple', 'Kiwies', 'Cherry', 'Date', 'Orange']
```

- **Add and remove elements from the list:**

```
fruits.append("Watermelon")
fruits.remove("Watermelon")
print(f"Modified list is: {fruits}")
```

Output:

```
Modified list is: ['Apple', 'Kiwies', 'Cherry', 'Date', 'Orange']
```

- **Find the length of the list:**

```
length = len(fruits)
print(length)
```

Output:

```
5
```

- **Sort the list in ascending order:**

```
fruits.sort()
print(f"Sorted fruits list is: {fruits}")
```

Output:

```
Sorted fruits list is: ['Apple', 'Cherry', 'Date', 'Kiwies',
'Orange']
```

Q7. Manipulate strings using various built-in functions.

- **Create a string variable and find the length of the string:**

```
text = "Hello, welcome to the world of Python programming!"
length_of_string = len(text)
print(f"Length of the string: {length_of_string}")
```

Output:

```
Length of the string: 50
```

- **Convert the string to uppercase and lowercase:**

```
uppercase_string = text.upper()
lowercase_string = text.lower()
print(f"Uppercase version: {uppercase_string}")
print(f"Lowercase version: {lowercase_string}")
```

Output:

```
Uppercase version: HELLO, WELCOME TO THE WORLD OF PYTHON PROGRAMMING!
Lowercase version: hello, welcome to the world of python programming!
```

- **Check if a substring exists in the string:**

```
substring = "Python"
is_substring_present = substring in text
print(f"Is '{substring}' present in the string?
{is_substring_present}")
```

Output:

```
Is 'Python' present in the string? True
```

- **Split the string into a list of words:**

```
words_list = text.split()
print(f"List of words: {words_list}")
```

Output:

```
List of words: ['Hello,', 'welcome', 'to', 'the', 'world', 'of',
'Python', 'programming!']
```

Q8. Write a program to find the largest and smallest number in a list.

- **Program:**

```
numbers = [34, 78, 12, 90, 5, 67, 88, 21]
largest_number = max(numbers)
smallest_number = min(numbers)
print(f"The largest number in the list is: {largest_number}")
print(f"The smallest number in the list is: {smallest_number}")
```

Output:

```
The largest number in the list is: 90
The smallest number in the list is: 5
```