Chapter 8 – Functions & Recursions

Practice Questions with Answers

Question 1:

Write a function `greet_user` that takes a user's name as an argument and prints a greeting message.

Answer:

```
def greet_user(name):
    print("Hello, " + name + "!")

greet_user("Shivam")  # Output: Hello, Shivam!
```

Question 2:

Write a function `add_numbers` that takes two numbers as arguments, adds them, and returns the result.

Answer:

```
def add_numbers(a, b):
    return a + b

result = add_numbers(3, 5)
print(result)  # Output: 8
```

Question 3:

Write a function `factorial` that calculates the factorial of a given number using recursion.

Answer:

```python
def factorial(n):
    if n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n - 1)

result = factorial(5)
print(result)  # Output: 120
```

Question 4:

Write a function `print_pattern` that prints the following star pattern for a given number `n`:

For example, `print_pattern(3)` should print:

```
*
**
***
```

Answer:

```python
def print_pattern(n):
    for i in range(1, n + 1):
        print('*' * i)

print_pattern(3)
```

Question 5:

Write a function `sum_of_list` that takes a list of numbers as an argument and returns the sum of all the numbers in the list.

Answer:

```python
def sum_of_list(numbers):
    total = 0
    for number in numbers:
        total += number
    return total

numbers = [1, 2, 3, 4, 5]
result = sum_of_list(numbers)
print(result)  # Output: 15
```

Explained Addition of List Steps:

Detailed Explanation of `total += number`

What Does `total += number` Mean?

- **`total += number` is a shorthand way in Python to say `total = total + number`.**

Step-by-Step Breakdown:

1. **Initial Value:**
    - **Let's say `total` starts at 0.**
2. **First Iteration:**
    - **The first `number` in the list is 1.**
    - **We do `total = total + number`.**
    - **So, `total = 0 + 1`.**
    - **Now, `total` is 1.**
3. **Second Iteration:**
    - **The next `number` in the list is 2.**
    - **We do `total = total + number`.**
    - **So, `total = 1 + 2`.**
    - **Now, `total` is 3.**
4. **Third Iteration:**
    - **The next `number` in the list is 3.**
    - **We do `total = total + number`.**

- **So, `total = 3 + 3`.**
- **Now, `total` is 6.**

5. **Fourth Iteration:**
   - **The next `number` in the list is 4.**
   - **We do `total = total + number`.**
   - **So, `total = 6 + 4`.**
   - **Now, `total` is 10.**
6. **Fifth Iteration:**
   - **The next `number` in the list is 5.**
   - **We do `total = total + number`.**
   - **So, `total = 10 + 5`.**
   - **Now, `total` is 15.**