Practice Problems on Function

Practicing Code:

1. Define and Call a Function

Write a function `greet_user()` that prints "Hello, welcome to Python programming!". Call the function.

---

2. Function with Parameters

Write a function `add_numbers(a, b)` that takes two numbers as input, adds them, and returns the result.

```
add_numbers(5, 3)  # Output: 8
```

---

3. Default Parameters

Write a function `introduce(name, age=18)` that prints a message introducing a person and their age. If age is not provided, it should default to 18.

```
introduce("Alice")          # Output: My name is Alice, and I am 18
years old.

introduce("Bob", 25)          # Output: My name is Bob, and I am 25
years old.
```

---

4. Return Multiple Values

Write a function `math_operations(x, y)` that returns the sum, difference, product, and quotient of two numbers.

```
result = math_operations(10, 2)
print(result)  # Output: (12, 8, 20, 5.0)
```

---

5. Recursive Function

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

```
factorial(5)  # Output: 120
```

---

6. Function to Check Even or Odd

Write a function `is_even(num)` that checks if a number is even or odd and returns `True` if it's even, and `False` otherwise.

```
is_even(4)  # Output: True
is_even(7)  # Output: False
```

---

7. String Manipulation

Write a function `reverse_string(s)` that takes a string as input and returns the reversed string.

```
reverse_string("Python")  # Output: nohtyP
```

Output Tracing:

1. What will be the output of the following code?

```
def calculate(x, y):
    return x * y

result = calculate(3, 4)
print(result)
```

Answer: 12

Explanation: The function `calculate` multiplies `3` and `4`, and the result `12` is returned and printed.

---

2. What will be the output of the following code?

```
def print_message():
    print("Learning Python is fun!")

print_message()
print_message()
```

Answer:

```
Learning Python is fun!
Learning Python is fun!
```

Explanation: The function `print_message` is called twice, so the message is printed twice.

---

3. What will be the output of the following code?

```
def increment(number):
    return number + 1

value = 10
print(increment(value))
```

Answer: `11`
Explanation: The function `increment` adds `1` to the input `10`, returning `11`.

---

4. What will be the output of the following code?

```
def mystery(a, b=10):
    return a + b

print(mystery(5))       # Line 1
print(mystery(3, 7))    # Line 2
```

Answer:

```
15
10
```

Explanation:

- Line 1: `mystery(5)` uses the default value `b=10`. So, `5 + 10 = 15`.
- Line 2: `mystery(3, 7)` overrides the default value. So, `3 + 7 = 10`.

---

5. What will be the output of the following code?

```
def greet(name):
    return "Hello, " + name

print(greet("Alice"))
print(greet("Bob"))
```

Answer:

```
Hello, Alice
Hello, Bob
```

Explanation: The `greet` function concatenates `"Hello, "` with the given name and returns the result.

---

6. What will be the output of the following code?

```
def fun_example(a, b):
    return a ** b

x = fun_example(2, 3)
y = fun_example(3, 2)
print(x, y)
```

Answer: `8 9`

Explanation:

- `fun_example(2, 3)` computes `2 ** 3 = 8`.
- `fun_example(3, 2)` computes `3 ** 2 = 9`.
