### **Lab 4:** **Functions in Swift**

Here's a lab exercise to help you practice creating and using functions in Swift. This exercise covers defining functions, using parameters and return values, and practicing with different types of functions including those with multiple parameters, default values, and overloading.

**Part 1: Basic Functions**

1. **Simple Function:**

* Write a function called greet that prints "Hello, World!".

func greet() {

print("Hello, World!")

}

// Call the function

greet()

1. **Function with Parameters:**

Write a function called greetUser that takes a String parameter name and prints "Hello, [name]!".

func greetUser(name: String) {

print("Hello, \(name)!")

}

// Call the function

greetUser(name: "Alice")

1. **Function with Return Value:**

Write a function called add that takes two Int parameters and returns their sum.

func add(a: Int, b: Int) -> Int {

return a + b

}

// Call the function and print the result

let sum = add(a: 3, b: 5)

print("Sum: \(sum)")

**Part 2: Functions with Multiple Parameters and Default Values**

1. **Function with Multiple Parameters:**

* Write a function called multiply that takes two Double parameters and returns their product.

func multiply(x: Double, y: Double) -> Double {

return x \* y

}

// Call the function and print the result

let product = multiply(x: 2.5, y: 4.0)

print("Product: \(product)")

1. **Function with Default Parameter Values:**

* Write a function called power that takes two Int parameters base and exponent (default value 2) and returns the result of raising base to the power of exponent.

func power(base: Int, exponent: Int = 2) -> Int {

var result = 1

for \_ in 1...exponent {

result \*= base

}

return result

}

// Call the function and print the results

let square = power(base: 3)

let cube = power(base: 3, exponent: 3)

print("Square: \(square)")

print("Cube: \(cube)")

**Part 3: Function Overloading**

1. **Overloaded Functions:**

* Write two overloaded functions called printValue. One should take an Int parameter and the other should take a Double parameter. Both should print the value passed to them.

func printValue(value: Int) {

print("Int value: \(value)")

}

func printValue(value: Double) {

print("Double value: \(value)")

}

// Call the functions

printValue(value: 42)

printValue(value: 3.14)

**Part 4: Practical Examples**

1. **Calculating the Area of a Rectangle:**

* Write a function called areaOfRectangle that takes two Double parameters length and width and returns the area of the rectangle.

func areaOfRectangle(length: Double, width: Double) -> Double {

return length \* width

}

// Call the function and print the result

let area = areaOfRectangle(length: 5.0, width: 3.0)

print("Area of rectangle: \(area)")

1. **Checking for Even or Odd:**

* Write a function called isEven that takes an Int parameter and returns true if the number is even and false if the number is odd.

func isEven(number: Int) -> Bool {

return number % 2 == 0

}

// Call the function and print the results

let evenCheck = isEven(number: 4)

let oddCheck = isEven(number: 5)

print("Is 4 even? \(evenCheck)")

print("Is 5 even? \(oddCheck)")

1. **Fahrenheit to Celsius Conversion:**

* Write a function called fahrenheitToCelsius that takes a Double parameter fahrenheit and returns the corresponding temperature in Celsius.

func fahrenheitToCelsius(fahrenheit: Double) -> Double {

return (fahrenheit - 32) \* 5 / 9

}

// Call the function and print the result

let celsius = fahrenheitToCelsius(fahrenheit: 98.6)

print("Temperature in Celsius: \(celsius)")

**Summary**

This exercise covers the creation and use of functions in Swift, including defining basic functions, using parameters and return values, handling multiple parameters and default values, and function overloading. By completing these tasks, you will become familiar with writing and calling functions to perform various operations in Swift. Experiment with additional operations and modifications to further enhance your understanding of Swift functions.