**Lab 16 - Working with Companion Objects in Kotlin**

Companion objects in Kotlin are used to define members of a class that are associated with the class itself rather than with instances of the class. This is similar to static members in Java, but with more flexibility.

**Exercise 1: Basic Companion Object**

Task: Create a class with a companion object that holds a static-like property and a method.

class MyClass {

// Companion object

companion object {

val staticProperty = "I'm a static property"

fun staticMethod() {

println("I'm a static method")

}

}

}

fun main() {

// Accessing companion object members

println(MyClass.staticProperty) // Output: I'm a static property

MyClass.staticMethod() // Output: I'm a static method

}

**Explanation:**

* The companion object keyword is used to define members that belong to the class rather than instances.
* staticProperty and staticMethod are accessed directly via the class name.

**Exercise 2: Companion Object as a Factory**

Task: Use a companion object as a factory to create instances of a class.

class User private constructor(val name: String, val age: Int) {

companion object {

fun create(name: String, age: Int): User {

return User(name, age)

}

}

}

fun main() {

// Using the factory method to create an instance

val user = User.create("Alice", 25)

println("User: ${user.name}, Age: ${user.age}") // Output: User: Alice, Age: 25

}

**Explanation:**

* The User class constructor is private, so it cannot be instantiated directly from outside the class.
* The companion object provides a factory method create that returns an instance of User.

**Exercise 3: Companion Object with Constants**

Task: Define constants in a companion object and use them in your program.

class Constants {

companion object {

const val MAX\_USERS = 100

const val APP\_NAME = "MyApp"

}

}

fun main() {

// Accessing constants from the companion object

println("App Name: ${Constants.APP\_NAME}") // Output: App Name: MyApp

println("Max Users: ${Constants.MAX\_USERS}") // Output: Max Users: 100

}

**Explanation:**

* The const keyword is used to declare compile-time constants in the companion object.
* These constants can be accessed directly via the class name.