# C++ Week 5 – Coding Assignments

## 1. Static vs Non-Static Members

* Create a class `Counter` with:
* - A static variable `count` shared by all objects.
* - A non-static variable `id` unique to each object.
* - A constructor that increments `count` and assigns it to `id`.
* - A `display()` function to print both `count` and `id`.

## 2. Demonstrate Single Inheritance

* Create a base class `Animal` with a method `speak()`.
* Create a derived class `Dog` that inherits from `Animal` and adds a method `bark()`.
* Call both methods from an object of `Dog`.

## 3. Demonstrate Multilevel Inheritance

* Create three classes: `Grandparent`, `Parent`, and `Child`.
* Each class should have a method that prints its class name.
* Create an object of `Child` and call all three methods.

## 4. Demonstrate Multiple Inheritance

* Create two base classes `Person` and `Department`.
* `Person` stores name and age, `Department` stores department name.
* Create a derived class `Employee` that inherits from both and adds employee ID.
* Take input and display all data.

## 5. Demonstrate Hierarchical Inheritance

* Create a base class `Vehicle`.
* Create two derived classes `Car` and `Bike` that inherit from `Vehicle`.
* Each class should have a method to describe its type.

## 6. Demonstrate Hybrid Inheritance

* Create a combination of multiple and multilevel inheritance:
* - `Person` is the base class.
* - `Employee` inherits from `Person`.
* - `Manager` inherits from both `Employee` and a separate class `Department`.
* Each class should have a method that prints its class role.
* Create an object of `Manager` and call all methods.