EXPERIMENT-10

- **AIM: -** To implement an object-oriented program in which a Person class is defined as a base class, and Student and Teacher classes are derived from it, demonstrating the concept of inheritance and polymorphism.
- **THEORY:** - Object-Oriented Programming (OOP):

➢ It models real-world entities as classes and objects.
➢ Provides features like inheritance, polymorphism, encapsulation, and abstraction.
➢ Inheritance:
➢ Mechanism of creating a new class using the properties and behaviors of an existing class.
➢ Promotes code reusability.
➢ Class Hierarchy:
➢ A structured representation where Person is the parent class.
➢ Student and Teacher are child classes that inherit from Person.
➢ Application:
➢ Such a hierarchy is used in university/school management systems, where persons may have different roles (student, teacher, staff).

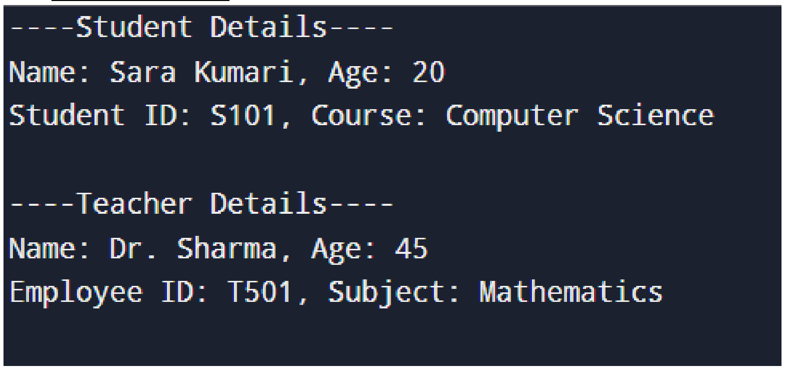
- **CODE:-**

```
# Base Class

class Person:

    def __init__(self, name, age):

        self.name = name

        self.age = age


    def display_info(self):

        print(f"Name: {self.name}, Age: {self.age}")
```

```
# Derived Class: Student
class Student(Person):
    def __init__(self, name, age, student_id, course):
        super().__init__(name, age)
        self.student_id = student_id
        self.course = course

    def display_info(self):
        super().display_info()
        print(f"Student ID: {self.student_id}, Course: {self.course}")


# Derived Class: Teacher
class Teacher(Person):
    def __init__(self, name, age, employee_id, subject):
        super().__init__(name, age)
        self.employee_id = employee_id
        self.subject = subject

    def display_info(self):
        super().display_info()
        print(f"Employee ID: {self.employee_id}, Subject:
{self.subject}")
```

```
# Driver Code
print("----Student Details----")
s1 = Student("Sara Kumari", 20, "S101", "Computer Science")
s1.display_info()

print("\n----Teacher Details----")
t1 = Teacher("Dr. Sharma", 45, "T501", "Mathematics")
t1.display_info()
```

- ➢ **OUTPUT→**



```
----Student Details----
Name: Sara Kumari, Age: 20
Student ID: S101, Course: Computer Science

----Teacher Details----
Name: Dr. Sharma, Age: 45
Employee ID: T501, Subject: Mathematics
```

- ➢ **LEARNING OUTCOMES-→**

✓ Understand and implement class inheritance in OOP.
✓ Create a hierarchical relationship between classes.
✓ Demonstrate method overriding using polymorphism.
✓ Apply OOP concepts to real-world modeling (students, teachers, staff, etc.).
✓ Enhance code reusability and modularity in software design.