**44-542 Object Oriented Programming**

**Inheritance and Polymorphism**

1. Suppose we have the following classes with the relationships described.
   1. **Person**
   2. **Employee** extends **Person**
   3. **Student** extends **Person**
   4. **Professor** extends **Employee**
   5. **Classroom**

Draw a UML diagram representing these classes and relationships. Include the **Object** class in the hierarchy.

1. Identify any illegal statements below, and explain why each one is illegal.

**Person person1 = new Person();**

**Employee emp1 = new Employee();**

**Student stu1 = new Student();**

**Professor prof1 = new Professor();**

**Classroom class1 = new Classroom();**

**Object obj1 = new Object();**

**emp1 = stu1;**

**person1 = emp1;**

**emp1 = person1;**

**emp1 = prof1;**

**prof1 = emp1;**

**obj1 = class1;**

**class1 = obj1;**

**person1 = stu1;**

**stu1 = person1;**

**Person person2 = new Employee();**

**Employee emp2 = new Person();**

**Professor prof2 = new Object();**

**Object obj2 = new Professor();**