ENPM808X: Week 3:Writing Assignment
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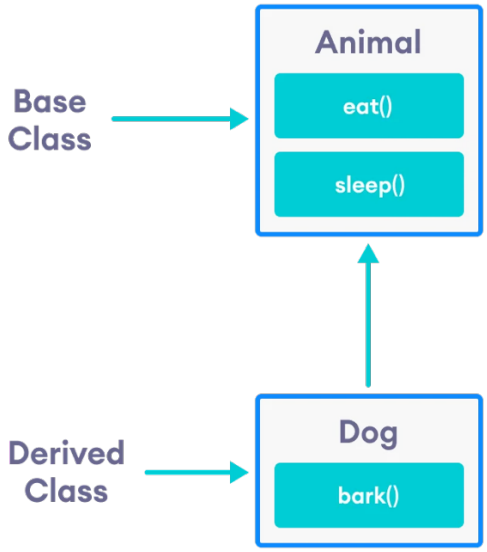
3.13 What is inheritance in object-oriented technology? Give an example.

Ans: It is the capability of a class to derive properties and characteristics from another class i.e super/ base class. For example, the Dog class is derived from the Animal class. Since Dog is derived from Animal, members of Animal are accessible to Dog.



3.14 What is the difference between an object and a class in OO technology?

Ans: Class is a blueprint or template from which objects are created. Object is an instance of a class.

3.15 Describe the role of polymorphism in object-oriented technology. Give an example.

Ans: Polymorphism is the ability of a message to be displayed in more than one form.
In C++ polymorphism is mainly divided into two types:

1. **Compile time polymorphism: This type of polymorphism is achieved by function overloading or operator overloading.**
2. **Runtime polymorphism: This type of polymorphism is achieved by Function Overriding.**

An simple example of polymorphism is:

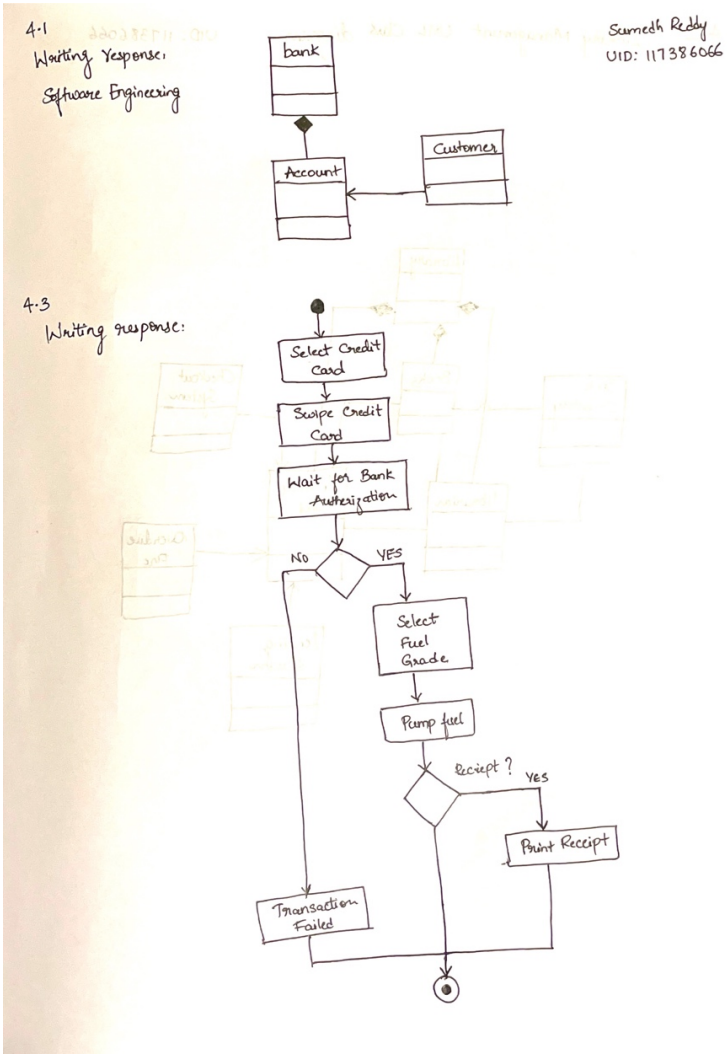
```
class FarmAnimal
{
public:
virtual void makeSound() {};
};
class Cow : public FarmAnimal
{
```

```
public:
void makeSound() {cout<<" Moo-oo-oo";}
};
class Sheep : public FarmAnimal
{
public:
void makeSound() {cout<<" Be-e-e";}
};
```

The incorporation of new functionality through polymorphism usually leads to small change propagation.

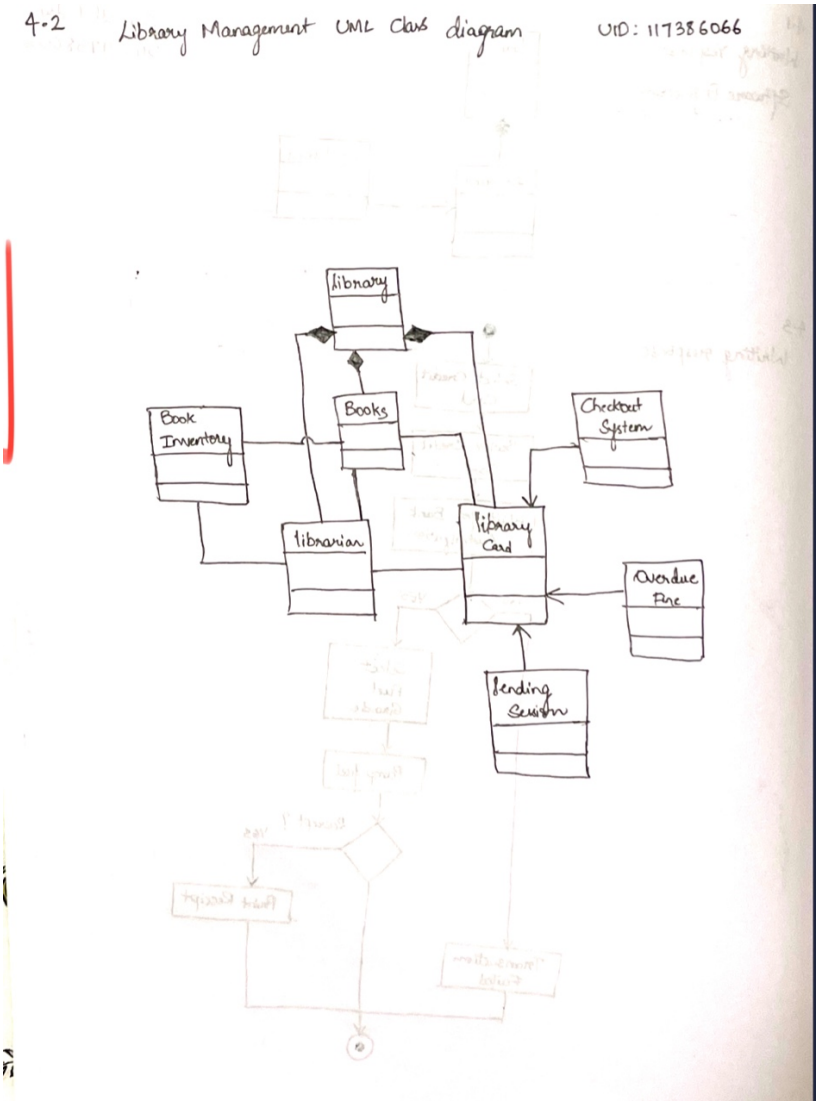
4.1 Draw a class diagram of a small banking system showing the associations between three classes: the bank, customer, and the account.
4.3 Draw an activity diagram of pumping gas and paying by credit card at the pump. Include at least five activities, such as "Select fuel grade" and at least two decisions, such as "Get receipt?"

solutions for 4.1 and 4.3:



4.2 Draw a class diagram of a library lending books using the following classes: Librarian, Lending Session, Overdue Fine, Book Inventory, Book, Library, Checkout System, and Library Card.

solution:



4.5 Explain how a class dependency graph differs from a UML class diagram?

Ans: A class dependency graph is a directed graph where nodes are all classes of the program and edges are all dependencies. Whereas a UML class diagram is a type of static structure diagram that describes the structure of a system by showing the system's: classes, their attributes, operations (or methods), and the relationships among objects.