ENPM808X: Software Development for Robotics

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1. **Software Engineering 3.13**

What is inheritance in object-oriented technology? Give an example
Relation between two classes is called Inheritance.

```
class Mother
    {
    public:
        String name;
        String address;
    };
class daughter:  public Mother
    {
    public:
        String name:
        String address;
    };
```

2. **Software Engineering 3.14**

What is the difference between an object and a class in OO technology?
A class is an entity that determines how an object will behave and what the object will contain. And An object is nothing but a self-contained component that consists of methods and properties to make data useful.

3. **Software Engineering 3.15**

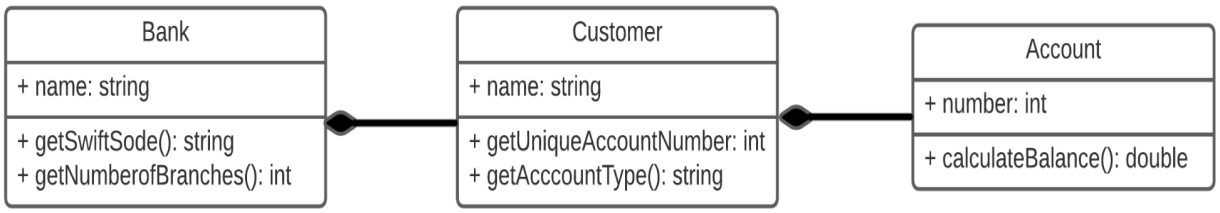
Describe the role of polymorphism in object-oriented technology. Give an example
Polymorphism allows you to define one interface and have multiple implementations.

```
class Mammal {
    public:
```

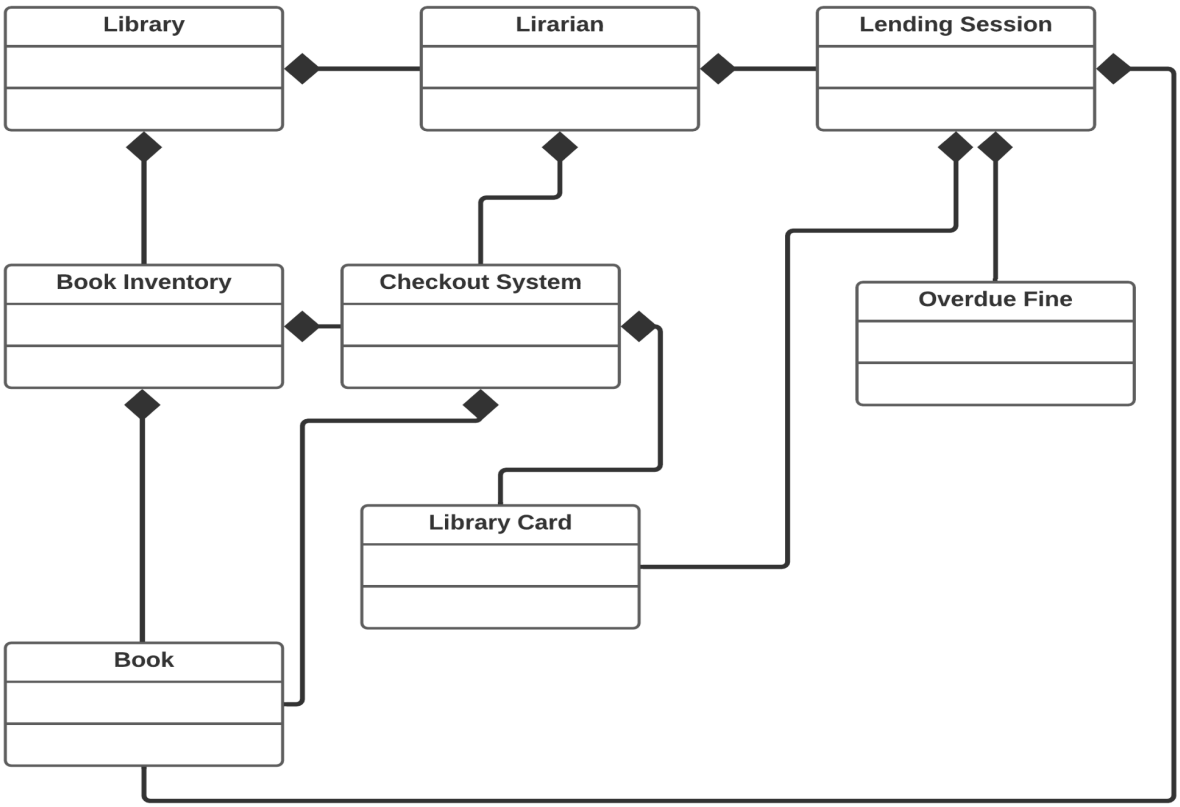
```
        void eat() {
         cout << "Mammals eat...";} };

class Deer: public Mammal {

public:
        void eat() {

                cout << "Deers eat grass...";}
};
class Bat: public Mammal {

public:
        void eat() {

                cout << "Bats eat insects...";}
};
```

4. **Software Engineering 4.1**

Draw a class diagram of a small banking system showing the associations between three classes: the bank, customer, and the account.



5. **Software Engineering 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

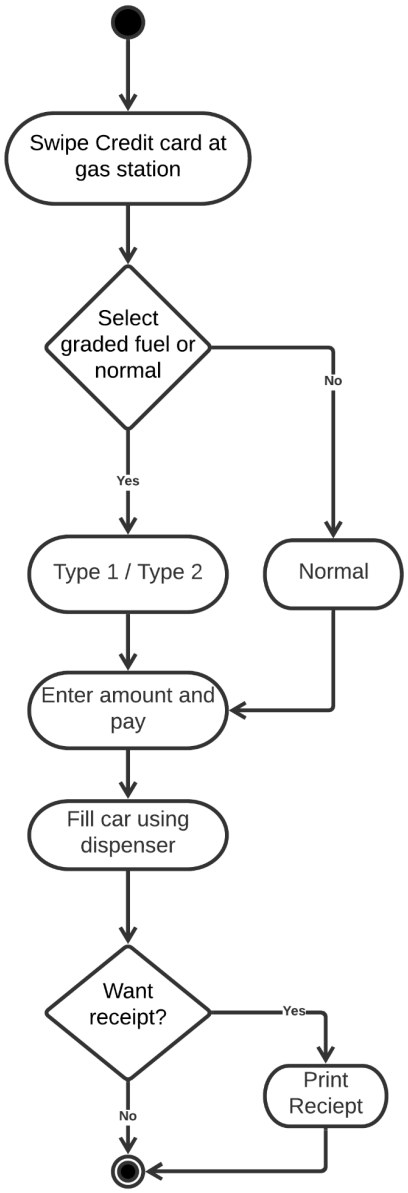


- ➔ **Librarian**: Carries information about librarian and functions include handling lending sessions, part of the library, and managing checkout system.
- ➔ **Lending Sessions**: Holds information with respect to lending session like book, fine, etc, and part of librarian's function.
- ➔ **Overdue Fine**: Carries information on overdue books fine amount and its calculation and also part of lending session.
- ➔ **Book Inventory**: Contains all books information in the library.
- ➔ **Book:** Carries information on the book like the author, name, etc. And part of checkout system, book inventory as well as lending session.

➔ **Library:** It contains all information about the library.
➔ **Checkout System**: Information about book checked out, generating receipt, etc.
➔ **Library Card:** Information about person lending the book.

6. **Software Engineering 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?”



7. **Software Engineering 4.5**

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

- ➔ UML defines the relation between classes as part-of and is-a whereas Class dependency graph defines supplier and client.
- ➔ Class dependency graph is similar in graphical notation to UML diagrams but represented as a directed graph.