**IN-Lab Task # 11.1**

**(Polymorphism)**

**IN-Lab Task # 11.1**

Design a Ship class that has the following members:

* A member variable for the name of the ship (a string)
* A member variable for the year that the ship was built (a string)
* A constructor and appropriate accessors and mutators
* A virtual print function that displays the ship’s name and the year it was built.

Design a **CruiseShip** class that is derived from the Ship class. The **CruiseShip** class should have the following members:

* A member variable for the maximum number of passengers (an int)
* A constructor and appropriate accessors and mutators
* A print function that overrides the print function in the base class. The**CruiseShip** class s print function should display only the ship’s name and themaximum number of passengers.

Design a **CargoShip** class that is derived from the Ship class. The CargoShip class should have the following members:

* A member variable for the cargo capacity in tonnage (an int).
* A constructor and appropriate accessors and mutators.
* A print function that overrides the print function in the base class. The**CargoShip** class s print function should display only the ship’s name and the ship’s cargo capacity.

Demonstrate the classes in a program that has an array of Ship pointers. The array elements should be initialized with the addresses of dynamically allocated Ship.

**IN-Lab Task # 11.2**

**(Multiple Inheritance)**

***Multiple inheritances enable a derived class to inherit members from more than one parent***. Herebase classes are **Person** and **Employee**, Derived class is **Faculty**. Attributes are as under:

|  |  |  |
| --- | --- | --- |
| **Person (Base Class)** | **Employee (Base Class)** | **Faculty (Derived Class)** |
|  |  |  |
| **protected:** | **protected:** | **protected:** |
| char name[10]; | int Emp\_no; | char designation[10]; |
| char address[10]; | float basic\_pay; | char department[10]; |
| char nic\_no[10]; | float house\_rent; | char course[10]; |
| int cell\_no; | float medical\_allow; |  |
|  | float conveyance\_allow; |  |
|  | float net\_pay; |  |
|  |  |  |

***Allowances are computed as:***

* *House rent is 45% of the basic pay.*
* *Medical Allowance is 5% of the basic pay.*
* *Conveyance allowance is 10% of the basic pay.*

**Keypoints:**

* *Use overloaded constructors to initialize attributes of all classes.*
* *Create an object of class “faculty” in main().*
* *Get input of all the attributes from user in main() and pass them to overloaded constructor of class “faculty”.*