Quiz 2

Question:1

You are tasked with developing a C++ program for a company that has different types of employees, including full-time employees, part-time employees, and contractors. Each type of employee has specific attributes and behaviors, and there are different levels of hierarchy within each employee type.Design a C++ program that incorporates multi-level inheritance to represent this scenario. Your program should include the following classes:

Employee: This is the base class that contains common attributes like name, ID, and hourly rate. It also has functions for calculating salary and displaying employee information.

FullTimeEmployee: This class inherits from Employee and adds attributes such as annual salary and benefits. It calculates the salary based on the annual salary and displays detailed information about full-time employees.

PartTimeEmployee: This class also inherits from Employee and includes attributes like hours worked and overtime pay rate. It calculates the salary based on the hours worked and displays detailed information about part-time employees.

Contractor: This class further extends the hierarchy by inheriting from PartTimeEmployee and includes attributes like contract duration and hourly rate. It calculates the salary based on the hours worked and displays detailed information about contractors.

Now, create a scenario where you have a company with various employees:

Two full-time employees: John Smith and Mary Johnson, each with different annual salaries and benefits.

Three part-time employees: David Brown, Sarah White, and Michael Green, each with different hours worked and overtime pay rates.

One contractor: Emily Davis, with a contract duration and hourly rate.

Write a C++ program that:

Defines the Employee, FullTimeEmployee, PartTimeEmployee, and Contractor classes with appropriate member variables and functions.

Implements constructors, destructor, and appropriate member functions for each class.

Calculates and displays the total salary expenditure for the company based on the salaries of all employees.

Question:2

In a manufacturing plant, three classes are employed for managing the production process: "Machine," "Robot," and "AutomatedProductionUnit." The "Machine" class represents traditional manufacturing equipment, while the "Robot" class signifies the advanced robotic machinery. The "AutomatedProductionUnit" class encapsulates a unit that incorporates both machine and robot capabilities.

1. Create a base class, "Machine," with the following attributes and methods:

- Attributes: modelNumber, productionCapacity, energyConsumption

- Methods: a parameterized constructor to set these attributes and a method to display machine details.

2. Create a derived class, "Robot," which inherits from the "Machine" class. The "Robot" class should include the following attributes:

-Attributes: programmingLanguage, sensorTypes , operatingEnvironment

Additionally, the "Robot" class should have methods:

- A parameterized constructor to set the robot-specific attributes.

- A method to display robot details.

3. Create another derived class, "AutomatedProductionUnit," which inherits from both "Machine" and "Robot." The "AutomatedProductionUnit" class should include the following attributes:

-Attributes: productivityRating , automationLevel , maintenanceCosts

The class should also have methods:

- A parameterized constructor to set the attributes specific to automated production units.

- A method to display the details of automated production units.

In the "main()" function:- Instantiate an object of the "AutomatedProductionUnit" class, setting parameters for the automated production units , robot and machine -specific attributes.

- Display the details of the machine, robot, and the automated production unit.