

Assignment 2: Relationships in Classes (Inheritance)

Mapped on CLO2

Deadline: 21st March

Total Marks: 20

RPG Character Creation System

You'll design a hierarchical inheritance system for creating characters in a role-playing game (RPG) using C++. Each character will have different attributes and abilities based on their class, and you'll implement friend functions and constructors to manage interactions between classes.

Define a base class called `Character`. This class should have the following attributes and methods:

- **Attributes:**
 - **name** (string): The name of the character.
 - **level** (integer): The level of the character.
 - **health_points** (integer): The current health points of the character.
- **Methods:**
 - **Character(name, level)**: Constructor to initialize the name and level of the character.
 - **display_info()**: Method to display basic information about the character (name, level, health points).
- **Create subclasses for different character classes:**
 - **Warrior**: A subclass of **Character** representing a warrior class. Warriors have attributes such as **strength** and **armor**.
 - **Mage**: A subclass of **Character** representing a mage class. Mages have attributes such as **intelligence** and **mana**.
 - **Rogue**: A subclass of **Character** representing a rogue class. Rogues have attributes such as **agility** and **evasion**.
- **Implement friend functions to handle interactions between characters:**
 - **battle(Character& opponent)**: A friend function that simulates a battle between two characters. Implement logic to calculate damage based on their attributes and adjust health points accordingly.
- **Implement constructors for each subclass to initialize their specific attributes:**
 - **Warrior(name, level, strength, armor)**: Constructor for the warrior class.
 - **Mage(name, level, intelligence, mana)**: Constructor for the mage class.
 - **Rogue(name, level, agility, evasion)**: Constructor for the rogue class.
- **Implement proper hierarchical inheritance to ensure code reusability and maintainability.**

Base Class: Character

Attribute	
name	The name of the character.
level	The level of the character.

health_points	The current health points of the character.
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Method	
Character(name, level)	Constructor to initialize the name and level of the character.
display_info()	Method to display basic information about the character (name, level, health points).

Subclasses: Warrior, Mage, Rogue

Warrior:

Attribute	
strength	The strength attribute of the warrior.
armor	The armor attribute of the warrior.
Method	
Warrior(name, level, strength, armor)	Constructor for the warrior class.

Rogue:

Attribute	
agility	The agility attribute of the rogue.
evasion	The evasion attribute of the rogue.
Method	
Rogue(name, level, agility, evasion)	Constructor for the rogue class.

Friend Function: battle (Character& opponent)

Parameter	
opponent	The opponent character in the battle.