Genshin-Inspired Combat & Wish System

Problem Analysis

The goal was to simulate a simplified RPG-style system inspired by Genshin Impact, involving character interaction, enemy combat, and a wish-based system to obtain characters or items. The problem being solved was: "How can we demonstrate OOP principles and modular design while recreating engaging mechanics from a popular RPG?"

Design Phase

OOP Design: The system was broken into modular classes:

Character – player character structure and behavior

Enemy – enemy types with health and attack methods

CombatSystem – handles combat logic between characters and enemies

WishSystem – simulates a gacha pull mechanic for characters/items

Header Files (.h): Defined interfaces and class structures

Implementation Files (.cpp): Implemented behaviors and logic

Build Phase

Developed using C++ in Visual Studio.

Each component was developed individually and tested in isolation before integration.

A main.cpp file serves as the driver, allowing users to interact with the systems.

Test Phase

Unit Testing: Functions like character creation, enemy damage, and wish pulls were tested for expected outputs.

Integration Testing: Ensured combat flows correctly and no crashes occur during wish pulls.

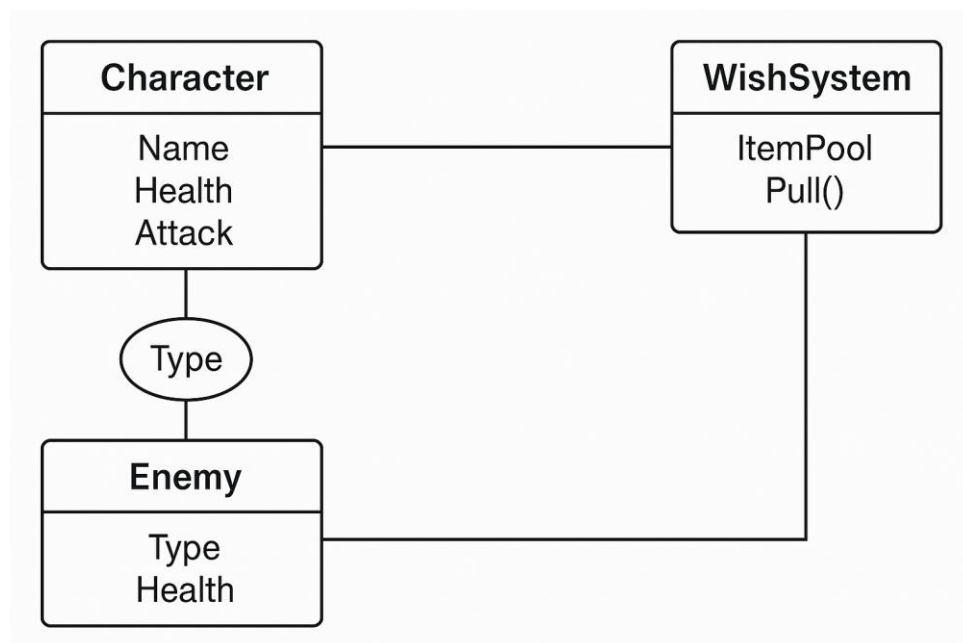Edge Cases: Tested invalid inputs or boundary conditions like 0 HP, or empty wish results.

Tools Used

Visual Studio (IDE)

C++ (Programming Language)

Object-Oriented Design Patterns

ER Diagram

Flowchart

```
                    ┌─────────┐
                    │  Start  │
                    └─────────┘
                         │
                         ▼
                ┌──────────────────┐
                │ Display welcome  │
                │     message      │
                └──────────────────┘
                         │
                         ▼
                       ◇ Main ◇
                       ◇ menu  ◇
            ┌────────────┼────────────┐
            ▼            ▼            ▼
      ┌──────────┐ ┌──────────┐ ┌──────────────┐
      │ Wish for │ │ View wish│ │ Start combat │
      │characters│ │  history │ └──────────────┘
      └──────────┘ └──────────┘
            │            │
            ▼            ▼
      ┌──────────┐ ┌──────────┐
      │ Perform  │ │  Show    │
      │  wish    │ │ history  │
      └──────────┘ └──────────┘
            │            │
            └────────────┼────────────┘
                         ▼
                       ◇ Exit ◇
                         │
                         ▼
                    ┌─────────┐
                    │   End   │
                    └─────────┘
```