

DEVELOPER MANUAL

BACKPACK HERO

1. PROJECT STRUCTURE

The project is divided into five packages:

- display: everything related to rendering using the Zen library.
- backpack: the backpack and all items.
- fighter: contains enemies and the hero, as well as an interface defining the methods implemented by both.
- dungeon: the map, including floors and rooms.
- actions: contains the different action types (curse, heal, attack, protection).

2. DISPLAY

- GameData: stores the current game state.
- GameView: displays the map, the backpack, and interactions.
- GameController: handles mouse clicks and user input.
- Main: launches the game.

3. BACKPACK

- BackPack is a 3x3 grid that can be expanded.
- There is an Equipment interface, and the item types:
Gear, Item, Gem, ManaStone, Curse, Consumable, Armor, Arrow.
- Position indicates where an item is placed in the backpack.

4. FIGHTER

- A Fighter interface is implemented by both Enemy and Hero and contains common methods (taking damage, checking if alive, protection, etc.).
- Hero contains all methods related to the hero.
- Enemy contains all methods related to enemies.

- EnemyInfo stores information about the different enemies (health, protection, XP, etc.).
- EnemyCreation generates a random value and creates an enemy based on that value from those defined in EnemyInfo.

5. MANA

Mana stones have three mana points and are recharged at the start of every combat. Magical weapons consume mana, the hero must use a mana stone in order to use them.

6. DUNGEON

- Floor: a dungeon floor.
- Room: dungeon rooms.
- Dungeon: contains 3 floors.

7. COMBAT REWARDS

After a combat, a reward is chosen randomly.

The player can choose where to place it in the backpack or decide not to take it.

8. DEATH

If the hero's HP reaches 0, the game ends with a Game Over screen and the Hall of Fame.

9. HALL OF FAME

The Hall of Fame displays the top three highest scores, calculated as: $\text{level at death} \times 100 + \text{total value of equipment in the backpack}$

10. ENERGY

The hero has 3 energy per turn.

Each weapon costs between 1 and 3 energy to use.

If no energy remains, the player can either:

- use items that cost 0 energy, or
- end their turn.

The hero can also attack without a weapon by clicking on an empty backpack slot, performing a bare-handed attack.

11. PATTERN MATCHING ON ITEM TYPES

A switch statement is used to recognize item types, avoiding multiple if statements. The switch directly selects the corresponding action for the item (for example, use for weapons, protection, or consumables).

12. DATA TYPES

- Enums: used for action types, item types (magic, bow, melee), and item rarity (common, uncommon, rare, legendary).
- Records: used for items they do not need to be mutable, their data never changes.
- Classes: used for elements that change during gameplay (hero, backpack, ..).

13. BUTTONS

Buttons are simple rectangles. If a click occurs within a button area, the corresponding action is triggered.