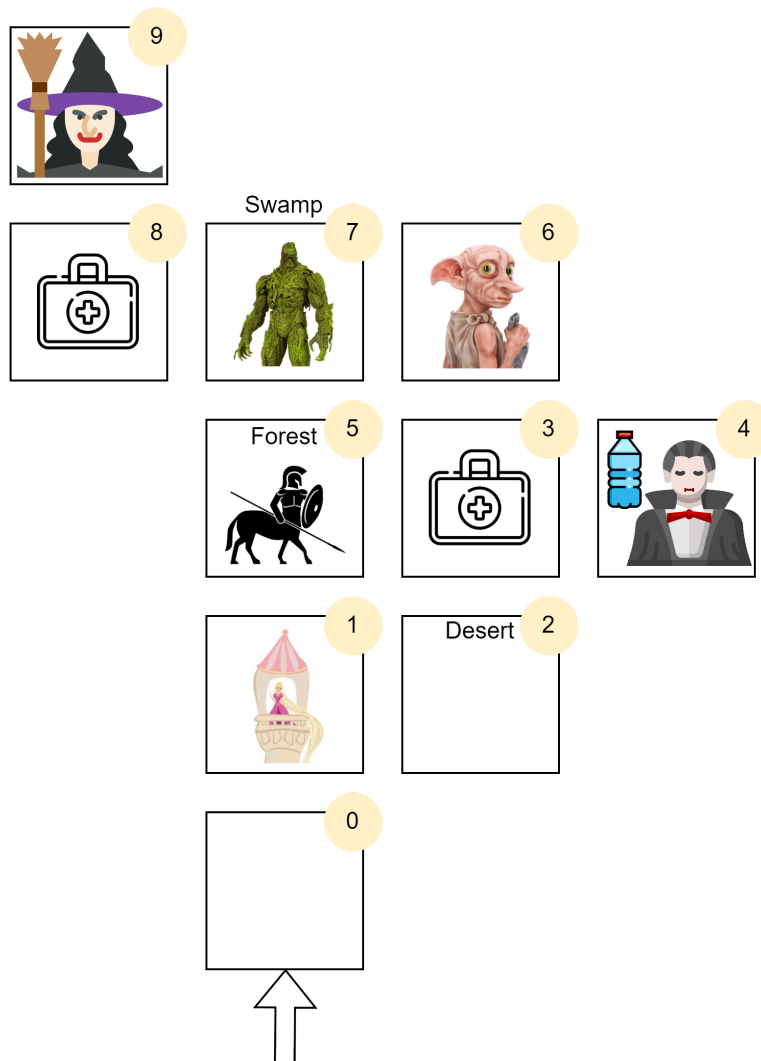




Overview

The Map and basic room settings



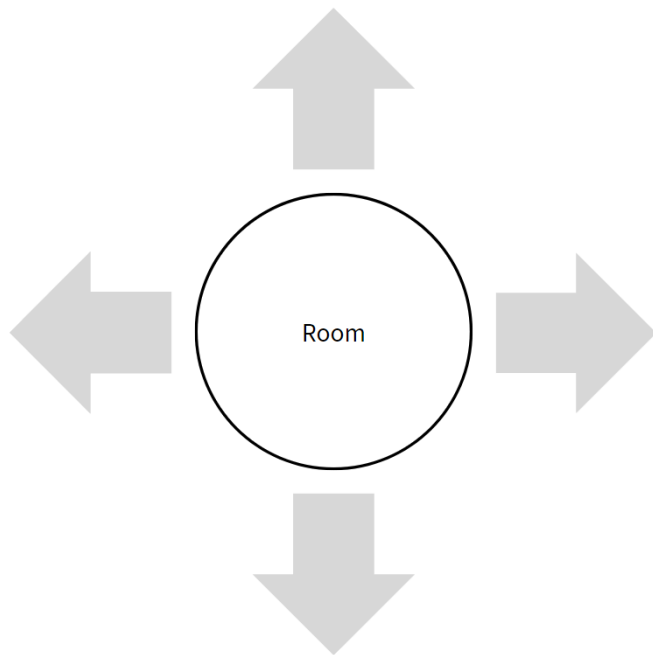
We have 10 rooms in total. Usually, the costs of hunger and thirst are 5 per 30 seconds.

- **ROOM 0:** You start the game here
- **ROOM 1:**
 - NPC: Princess Loretta
 - sword
 - armour
- **ROOM 2:** Desert, hunger -5 thirst -10 per 15 seconds
 - Sandstorms, hunger -10 thirst -20 per 15 seconds
 - Camel
 - Oasis: reset thirst state to 100
 - Treasure box: get items
- **ROOM 3:** First aid kit
- **ROOM 4:**
 - Monster: Vampire (special poisonous monster)
 - Water
- **ROOM 5:** Forest, hunger -10 thirst -5 per 15 seconds
 - NPC: Centaur Firenze
 - Unicorn's blood: antidote to all kinds of poison
 - Serpent: got poisoned if bitten
 - Lake: gain water
 - Bear: attack or pretend to be dead
 - Deer: increase health
- **ROOM 6:**
 - NPC: Dobby
 - Butterbeer glazed bread
 - Chocolate Frog
- **ROOM 7:** Swamp, hunger -5 thirst -5 per 15 seconds
 - Monster: Swamp Thing (沼澤異形)
 - Alligator: got bitten and need medications. Unhealed wound led to consequences including extreme thirst cost: -15 per 15(or 30 if transferred to another room) seconds. Health also decrease because of the alligator's attack
- **ROOM 8:** First aid kit
- **ROOM 9:**
 - Monster: Witch. The big boss with stronger attack and defense. Also the key of winning the game.

Basic Functions

□ Movement:

Dungeon::handleMovement()



Moving options may differ based on room settings
Basically, there are four possible options
U. Up D. Down R. Right L. Left

For example, If player is in Room 0, there will only
be one option
U. Up

□ Action Menu

Dungeon::chooseAction()

- Move
- Check Status
- Talk to shop: You can “buy” things from shop. As an exchange, you must “pay” using your health.



Potion: Antidote to all kinds of poison.
-10 health to get it



Water: reset thirst state to 100
--5 health to get it



Pinky Candy: Food. reset health state to 100
-8 health to get it

- Open Backpack
- Eat Food
- Drink Water

□ Showing status

Player::()triggerEvent(Object*)

- Player's name and tag
- Max Health: automatically set to 150, current health can't exceed this number even with many items obtained from NPC and rooms.
- Current Health
- Attack
- Defense
- Backpack: listing all of the items
- Hunger state
- Thirst state
- Poison State
- Current location
- Whether the player is wounded

□ Fighting System

Monster::triggerEvent(Object*)

- Attack
 - Whether you cause enough damages depends on "Monster's Defense" and "Your Attack"
 - Whether you take extreme damages depends on "Your Defense" and "Monster's Attack"
 - Collateral damage: defense state may decrease because of monster's attack
 - If your attack is stronger than monster's defense, the monster is hurt drastically (your attack - monster's defense). Meanwhile, the monster also hurts you a bit (health -5, defense -5).
 - Vice versa.
- Retreat
 - Go back to the previous room
 - Not recommended: health -10

□ Pick up items

Player::()addItem(Item)

Dungeon::()handleEvent(Object*)

- player may increase some health/attack/defense after picking up items
- Items may fall into different categories (tag)

Item	Category	Function	Ways to get it
Pinky Candy	Food	Reset Hunger State	From Shop
Butterbeer Glazed Bread	Food	Reset Hunger State	From NPC Dobby
Chocolate Frog	Food	Reset Hunger State	From NPC Dobby
Potion	Antidote	Reset Poison State	From Shop
Unicorn's Blood	Antidote	Reset Poison State	From NPC Firenze
Water	Water	Reset Thirst State	In Room From Lake (forest) From Oasis (Desert)
Diamond	Fortune	Increase states	From Treasure Box
Emerald	Fortune	Increase states	From Treasure Box
Gold	Fortune	Increase states	From Treasure Box
First Aid Kit	Meds	Heal wounds	In Room

□ NPC

`NPC::triggerEvent(Object*)`

Interact with NPCs to get things you might need.



PRINCESS LORETTA

- Trapped in tower
- You may obtain Sword and Armour



THE HOUSE ELF DOBBY

- Caught by the witch and was forced to stay
- You may obtain food (Butterbeer Glazed Bread or Chocolate Frog)



THE CENTAUR FIRENZE

- Living in the forest
- You may obtain Unicorn's Blood

□ Game Logic

`Dungeon::checkGameLogic()`

- Win the game: Defeat the Witch and end the game
- Lose the game: Your current health may decrease because of your Wound, Poison, Hunger and Thirst state. You may also be harmed by the Monsters. Any cause leading to 0 health will make you lose the game.

□ Hunger System Design

Dungeon::start_timer()

Dungeon::stop_timer()

Player::useItem(int)

○ Hunger

- Original: 100
- Decreases as the game progress
 - In ordinary room, decrease 5 per 30 seconds
 - swamp, forest or desert: decrease per 15 seconds
- Health starts to decrease if hunger state become 0
- Different cost under different circumstances:
 - In the forest, you feel hungrier (-10).
 - If you are faced with sandstorms, you feel very hungry (-10).
- Food: 3 kinds(pinky candy, butterbeer glazed bread, chocolate frog), can be obtained from store or NPC.

○ Thirst

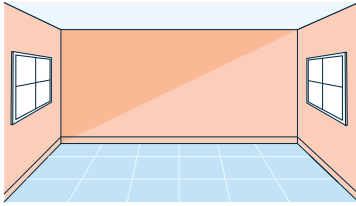
- Original: 100
- Decreases as the game progress
 - In ordinary room, decrease 5 per 30 seconds
 - swamp, forest or desert: decrease per 15 seconds
- Health starts to decrease if thirst state become 0
- Different cost under different situations
 - In the desert, you feel thirstier (-10).
 - If you are faced with sandstorms, you feel very thirsty (-20).
 - If you have wounds unhealed, your thirst state decrease more (-15).
- Water: 4 ways to acquire water (from lake, from oasis, in the room, from shop)

○ Poison

- Original: 0
- Health decrease the same amount once the player is poisoned
- 2 different poison:
 - from Vampire (the poisonous monster)
 - from wildlife (the poisonous serpent in the forest)
- 2 different items for detoxification:
 - Potion: from shop
 - Unicorn's Blood: from NPC

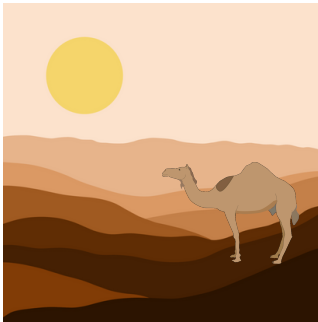
□ Room system design

Dungeon::handleRoomSettings()



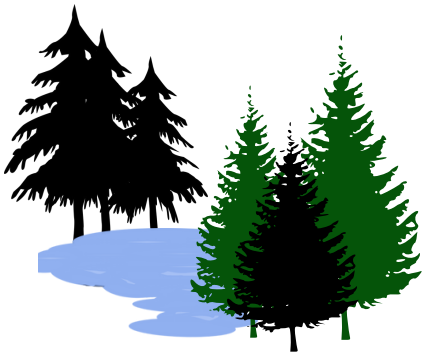
ORDINARY

- Hunger/Thirst cost: 5/5 per 30 seconds
- Items, NPC, Monster may show up



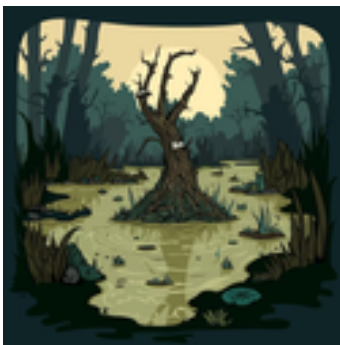
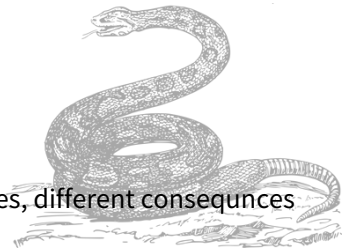
DESERT

- Normal Hunger/Thirst cost: 5/10 per 15 seconds
- SandStorms: 10/20 per 15 seconds
- Camel
- Oasis: Thirst state replenished. Both hunger and thirst cost get back to normal
- Treasure box: you might find some gems and increase your health



FOREST

- Normal Hunger/Thirst cost: 10/5 per 15 seconds
- NPC: The centaur Firenze
- Serpent: Got bitten and be poisoned
- Lake: thirst state replenished
- Bear: attack or pretend to be dead---different choices, different consequences
- Deer: health +15



SWAMP

- Normal Hunger/Thirst cost: 5/5 per 15 seconds
- Monster: The Swamp Thing
- Alligator: Got wounded and bitten
- The Porter: Get ported to somewhere in the swamp. Your wound heals there.

Extra Enhancement

☐ Randomness

- Events you might encounter in the three special rooms listed in the room system design is RANDOM. You don't know what you'll be faced with every time you play the game.
- In room with more than one objects/NPCs/Monsters, randomness was also introduced. Sometimes you may meet the Monster while sometimes you can obtain items.

☐ Different Characters

you can choose what you want to play at the beginning of the game. Different original settings including the equipments shall be applied.

- The Witcher
- The Mage

☐ Wound

- If you meet the alligator in the swamp, you'll get injured.
- The injury will cause a faster loss of your thirst state. (-15)
- If you have no medications in your backpack and the Porter isn't triggered(cause this is random), you will leave the swamp with an unhealed wound. You'll need to find something to treat your wound.

Implementation Details

Only important features and implementation details not mentioned above are elaborated in this section.

☐ Inheritance and virtual function

- Object: the base class

virtual bool triggerEvent(Object*) = 0	pure virtual function Different functions for different child class
virtual bool triggerPoison(Object*)	Only implemented in the Monster class

- getName() and other functions can be directly access and use by the child classes

□ the triggerPoison function

- This is a function implemented for the special poisonous monster: Vampire.
- Player got poisoned if bitten by the vampire.
- Player's health also falls.

□ Dungeon::start_timer(), Dungeon::stop_timer()

- Included packages: thread, chrono, atomic, mutex, condition variable
- Thread control is needed
 - when a timer should be functioning in the background
 - when we want to restart the timer in different rooms because of the different hunger and thirst cost
 - when we want to avoid multi-timer/multi-thread: timer_thread.join()
- unique_lock<mutex> lock(timer_mutex) and timer_running
 - stop timer immediately if the player change the room
 - only using timer_thread.join() is not enough cause it's going to wait for the current thread to finish before starting a new one (this may cause weird behavior)
 - timer_running is a boolean value and is set to true when player enter the new room

□ NPC scripts

- The scripts are written in files. I use fstream to load the files.

□ Tags

- Room tags: show if it's an ordinary room.
- GameCharacter tags: for recognition. ("Player", "Monster", or "NPC")
- Item tags: the categories of such items.

