



ELECTRICAL TEAM TRAINING

TASK 8

Task 8.1: Clash of Shadows

About

In the dark and rainy streets of Gotham, Batman and the Joker meet for a final battle. Batman, with his gadgets and strong will, faces off against the Joker's wild and unpredictable attacks. As they fight, every move is crucial, and the fate of Gotham hangs in the balance. In this dramatic showdown, only one will triumph and only one will be left in the shadows.



Requirements

1. Design a C++ program to simulate a fight between Batman and the Joker using OOP principles.
 - The fight alternates between Batman and the Joker, with each character taking turns to attack.
 - After each attack, print the following:
 - The character performing the attack.
 - The type of shield or gadget used.

- The remaining health of the opponent.
- **Ending the Fight:** The fight ends when either Batman or the Joker’s health drops to zero or below.
- Print a message declaring the winner and the final state of the fight.

2. Draw **State Machine Diagram** of this OOP System.

Notes

- Maximize the use of OOP principles as possible (Abstraction, Inheritance, Polymorphism and Encapsulation).
- **Attributes for each character:**

Attribute	About
Health	<p>It represents the character’s health and it’s affected by the enemy’s weapon according to the weapon damage (some weapons have special functions).</p> <p>Initial: 100 for each character</p>
Energy	<p>Every time a character uses a weapon or shield, a specific amount of energy is consumed from himself.</p> <p>Initial: 500 for each character</p>
Shield	<p>The shield protects the character partially from the opponent's attack according to the percentage of reduction from weapon attack.</p>

- **Batman's Gadget:**
 - Weapons

Weapons	Energy	Damage	Use	Description
Batarang	50	11	Infinity	A sharp, bat-shaped throwing weapon designed for precision attacks. The Batarang is a versatile tool, capable of disarming enemies or delivering a disabling blow from a distance.
Grapple Gun	88	18	5	A multipurpose tool that can pull enemies closer or escape danger. The Grapple Gun's line can also be used as a weapon, striking opponents with quick, unexpected force.
Explosive Gel	92	10 (reduce 20% of next opponent attack)	3	A high-tech gel that can be remotely detonated. Ideal for causing large-scale damage or breaking through defenses, the Explosive Gel can turn the tide of battle in an instant.
Batclaw	120	20 (can't avoid it)	1	A powerful, claw-like device used to grab or pull objects and enemies. The Batclaw can disable opponents by pulling them off balance or directly striking them.

- Shields

Weapons	Energy	Save	Use	Description
Cape Glide	20	40% of opponent damage	Infinity	Batman's cape, engineered to allow him to glide across the battlefield and evade attacks. It reduces damage by allowing quick escapes and repositioning.
Smoke Pellet	50	90% Of opponent damage	2	A small, throwable device that creates a thick cloud of smoke, obscuring vision and confusing enemies. Perfect for avoiding direct hits and setting up counterattacks.

● **Joker’s Gadget:**

- Weapons

Weapons	Energy	Damage	Use	Description
Joy Buzzer	40	8	Infinity	A deadly handshake device that delivers a powerful electric shock. The Joker uses it to surprise and incapacitate his enemies with a touch of humor.
Laughing Gas	56	13	8	A toxic gas that induces uncontrollable laughter, leading to physical collapse. The gas spreads quickly, affecting all those in its vicinity, making it a dangerous area-of-effect weapon.
Acid Flower	100	22	3	A seemingly harmless flower that sprays corrosive acid when triggered. It's a classic trick in the Joker's arsenal, capable of melting through armor and causing severe burns.

- Shields

Weapons	Energy	Save	Use	Description
Trick Shield	15	32% of opponent damage (except Batclaw)	Infinity	A deceptive shield that creates false images to confuse opponents. The Trick Shield makes it difficult for enemies to land a direct hit, reducing damage through misdirection.
Rubber Chicken	40	80% Of opponent damage (except Batclaw)	3	A seemingly silly rubber chicken filled with high-density rubber. The chicken acts as a highly elastic shield that can absorb and rebound attacks, surprising the opponent with its effectiveness.

Resources for Task 8.1

1- Online tool for drawing the state machine diagram [Visual Paradigm](#)

Bonus:

About

In Gotham City, Batman is facing off against the Joker, who has set up dangerous traps all over the city. In the Batcave, Batman carefully arranges his gadgets so he can grab them quickly and in the right order when he needs them. Each gadget is important for stopping the Joker and keeping people safe. Batman needs to be ready to act fast, using his well-organized gadgets to defeat the Joker and protect Gotham.



Requirements

- You need to design and implement a **Queue** using two stacks.

- Add Batman's weapon names and shields to the queue, and then display the contents of the queue.

Submission

- You will submit your code as a **cpp file for the OOP problem** and a **pdf file for the diagram for Task 8.1**.
- You will submit your code as a **cpp file for the Bonus problem**.
- The Task's deadline is 14/8 11:59 PM.
- Q&A Sheet (if you have any question regarding the sessions or the task) : [Q&A Sheet](#)
- Submission form: <https://forms.gle/uW9Zbq4FzkfHZhJN6>
- **Cheating is severely penalized**