CCPROG2 AY 2024 – 2025 3ʳᵈ Term MP Specifications
"Yohane The Parhelion! The Siren in the Mirror World!" [1]

In this game, players will take on the role of Yoshiko Tsushima (otherwise known as "Yohane"), one of the nine members of the school idol group **Aqours**, to solve mysterious phenomena involving idols losing their voices everywhere.

Game Premise

A school idol group known as Aqours consisting of Chika, Riko, You, Hanamaru, Ruby, Dia, Mari, Kanan, and Yoshiko are preparing for a live that will be held in Tokyo along with JPOP idols and KPOP Idols. However, a phenomenon started to occur when these idols started losing their voices.

One day, members of Aqours started losing their voices as well, and Yoshiko (who calls herself Yohane) vows to unleash her inner fallen angel named "Yohane" to solve this mystery. One evening, during a peaceful moment of slumber, she awakens into a mirror world where it is discovered that a siren has been stealing the voices of idols from her dimension in an attempt to have the perfect singing voice. Guided by her companion, Lailaps, she must venture into the

domain of this Siren and rescue her fellow idols' alternate selves in this dimension, retrieve their voices back, and foil the Siren's scheme once and for all!

Game Setting

The game takes place in Numazu, which is located in the Shizuoka prefecture of Japan. In the course of the game, Yoshiko will have to travel to different locations of Numazu in the mirror world that have been taken over by the Siren that is holding the alternate selves of her fellow Aqours' members hostage. These locations are different for each playthrough and depend on the Aqours member that is currently held hostage by the Siren

Gameplay Mechanics

The game is a rogue-lite game, where each playthrough consists of (possibly) changing environments. The most important aspects for each playthrough is that the gameplay proper follows the following blueprint:

1.) At the start of the game, 3 (out of 8) idols are "randomly" selected to be the one that Yohane will rescue. This, in turn, will determine the location name of the 3 dungeons available for that playthrough
2.) Each dungeon consists of a 2D environment that contains obstacles and traps that require players to lead Yoshiko and Lailaps through. Reaching the end indicates that a dungeon is "cleared".
3.) After a dungeon is cleared, that dungeon is no longer selectable for the duration of that playthrough. Players then have the option to select another dungeon to clear. This process is repeated until the 3 dungeons are cleared, and therefore, the 3 idols held hostage for that playthrough are rescued
4.) After the 3 dungeons are cleared, the "final dungeon" becomes available, which is where the Siren is located in
5.) Clearing the final dungeon indicates the defeat of the Siren, meaning that the player has won that current playthrough
6.) After a cleared playthrough, their progress is saved and previous Aqours members are carried over to their succeeding playthroughs (Although, it should be noted, that the Aqours member previously held hostage can not be held hostage in succeeding

playthroughs UNLESS all 8 members have been rescued at least once for that succeeding playthrough)

7.) Over the course of multiple playthroughs, there are achievements unlocked that are awarded to the player for performing certain tasks (More of this to be discussed later on)

Main Menu Module

Once you start the application, the player is provided with a main menu that will enable them to either start a new game (if no current playthrough is happening), continue the game (if a playthrough exists), and to view their current achievements. A sample main menu module exists in the figure below which may be used as a reference.

```
************************************************
*            Yohane The Parhelion!            *
*         The Siren in the Mirror World!      *
************************************************


          [N]ew Game
          [V]iew Achievements
          [Q]uit

Your choice:
```

If a playthrough is currently happening, [N]ew Game should be replaced with [C]ontinue as shown below

```
************************************************
*            Yohane The Parhelion!            *
*         The Siren in the Mirror World!      *
************************************************


          [C]ontinue
          [V]iew Achievements
          [Q]uit

Your choice:
```
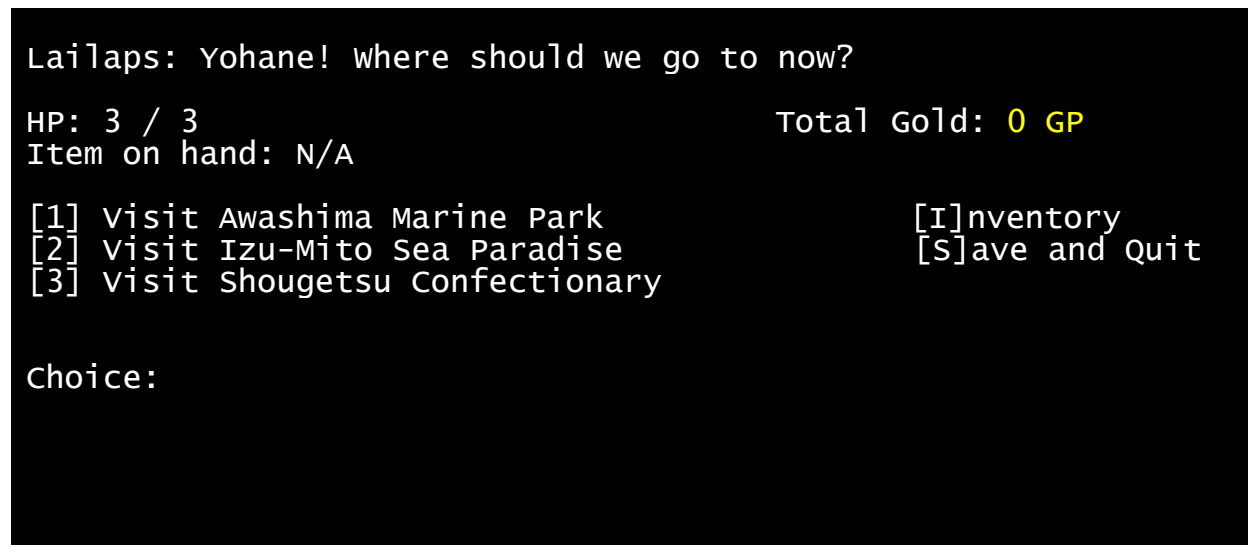
Gameplay Interface

At the start of each playthrough, players are informed of which Aqours members have currently been held hostage by the Siren in the Mirror World that Yohane will have to rescue. Afterwards,

they are presented with a menu that will allow them to traverse through the 3 dungeons in the order that they wish to proceed in. An example is as follows:

```
Lailaps: Yohane! Where should we go to now?

HP: 3 / 3                              Total Gold: 0 GP
Item on hand: N/A

[1] Visit Awashima Marine Park            [I]nventory
[2] Visit Izu-Mito Sea Paradise           [S]ave and Quit
[3] Visit Shougetsu Confectionary


Choice:
```

Specifically, the following choices are available in the game menu:

1.) Choices 1 – 3 = Traverse a dungeon. Note that a dungeon that has been cleared should have the choice replaced with an x, indicating that it is no longer selectable.

2.) Inventory = Selected using the 'I' character. This module allows Yohane to view the items available to her.

3.) Save and Quit = Returns to the main menu AND saves your progress.

4.) Visit Hanamaru's Shop = Selected using the 'H' character. Available ONLY Once Hanamaru has been rescued in the current playthrough, or in previous playthroughs.

The Dungeon Names are dependent on which character the user will have to save. They are as follows:

Character to Save	Dungeon Name
Chika	Yasudaya Ryokan
Riko	Numazu Deep Sea Aquarium
You	Izu-Mito Sea Paradise
Hanamaru	Shougetsu Confectionary
Ruby	Nagahama Castle Ruins
Dia	Numazugoyotei
Kanan	Uchiura Bay Pier
Mari	Awashima Marine Park

Clearing a dungeon makes that dungeon unselectable for the playthrough. An example menu showing the two dungeons (Awashima and Izu-Mito Sea Paradise) out of three dungeons cleared is seen below

```
Lailaps: Yohane! Where should we go to now?

HP: 4 / 5                               Total Gold: 362 GP
Item on hand: N/A

[X] Visit Awashima Marine Park              [I]nventory
[X] Visit Izu-Mito Sea Paradise             [S]ave and Quit
[3] Visit Shougetsu Confectionary


Choice:
```

Dungeon Interface

Once the player has decided to visit a dungeon, the dungeon interface should enable the players a good view of what the dungeon's contents and the player's current state is. A reference is indicated below

```
Dungeon #1: Izu-Mito Sea Paradise
Floor 1 of 2

HP: 3 / 3                               Total Gold: 24 GP
Item on hand: N/A

*******************************************************
*.....x...............x...............................*
*..T..x....h.......x...............b...............*
*.....x....hh.......x.......ww.......xx............*
*.....xx.......b...xx......ww.......xx...x...b....*
*.....x...v......xx..x....ww.......xx.b..x.......*
*.x...x...x......vx..x....ww.......xx....x.......*
*.x...Y...x......vx......ww.......xx..vvv...xxxbxx*
*..x..vvvvvvvvvvvv....vvvvvww.......xx.h.....vv.....*
*..x...x.............vvv...........h.....vv....*
*......x............v......b....h....vv.b..E*
*******************************************************
```

Specifically, whenever the player decides to traverse a dungeon, the following information should be indicated:

1.) Dungeon no. and name of the stage – This is depicted on the dungeon that the player selected
2.) Floor no. – Indicates their level within the dungeon
3.) HP – The amount of hitpoints. If this reaches 0, it's game over!
4.) Item on hand - The item that Yohane currently has with her in the dungeon. (More on this later)
5.) Total Gold – Amount of Gold Yohane has on hand
6.) Dungeon Layout – A 2D grid representing the contents of the dungeon Yohane is currently traversing

Dungeon Layout

It is important that the interface for each dungeon contains the following:

1.) Yohane's location – Denoted with the character Y. This is where Yohane is in the dungeon. Players have the option to move her with the WASD movement scheme. This means 'W' moves her u, 'A' moves her left, 'S' moves her down, and 'D' moves her right. There is also an option to press 'X' which makes her stay still and not move
2.) Dungeon border – Denoted with the character *. These are impassable and should surround the dungeon at all times
3.) Passable Tiles – Depicted with the character '.'. These are areas that Yohane (and enemies) can pass through without any consequences
4.) Wall Tiles – Depicted with the character 'v'. These are wall tiles that Yohane can dig and destroy, replacing them with passable tiles '.'. Do note that, when digging Wall tiles, Yohane stays put and does not advance to the direction of the Wall tile she just dug
5.) Spike Tiles – Depicted with the character 'x'. These are tiles that, while Yohane can dig and destroy, will damage Yohane. Destroying a spike tile deals .5 HP damage
6.) Water Tile – Depicted with the character 'w'. These are tiles that Yohane cannot pass over, but certain enemies (like Bats) can pass over.
7.) Heat Tile – Depicted with the character 'h'. These are tiles that are passable to Yohane, but should she not move while standing on top of one (either through digging, attacking an enemy, or intentionally not moving), she will take 1 HP damage.

8.) Treasure Tile – Depicted with the character 'T'. Gives Yohane a random treasure, either gold (Random value between 10g to 100g) or an item (Noppo Bread). Only one Treasure tile spawns per dungeon floor.

9.) Exit Tile – Depicted with the character 'E'. This allows Yohane to proceed to the next floor of the dungeon or end the dungeon when they are at the last floor

10.) Bats Tile – Depicted with varying characters ('b') in the example. More on this in a later section

The no. of floors of a dungeon denotes the no. of levels or layouts that the player will have to traverse to. They are as follows:

1.) 1st Dungeon = 1 floor
2.) 2nd Dungeon = 2 to 3 floors
3.) 3rd Dungeon = 3 to 4 floors

Moving

When Yohane is traversing a dungeon, everything she does is considered a movement or a turn. This includes things like:

1.) Moving Up, Down, Left, or Right
2.) Pressing an invalid input (In which case, Yohane will NOT move)
3.) Digging Walls
4.) Activating her item on hand
5.) Switching between items in her possession

In short, anything that involves pressing a button is considered as a movement made by Yohane. Movements are important as different elements within the dungeon will react according to the movement Yohane made during her turn.

Digging Walls

When Yohane comes in contact with a wall tile that she can dig, the wall tile disappears and is replaced with a passable tile. However, Yohane remains still. The demonstration can be seen in the figure below. Here, Yohane is adjacent to a wall tile to her right. This means if the player tells her to move right (presses 'D') while she is to the left of the wall, it counts as "digging" the wall.

```
*******           *******
*..v..*    'D'    *..v..*
*.Yv..*   --->    *.Y...*         (Digging the middle wall)
*..v..*           *..v..*
*******           *******
```
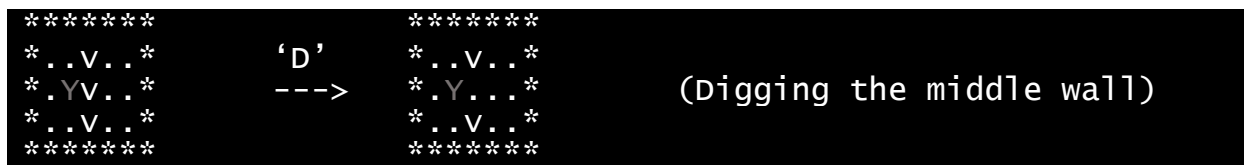
Do note that digging a wall counts as a movement / turn. Be careful of digging walls while standing on top of heat tiles as doing so counts as being idle in front of one, leading to damage!

Switching & Using Items

Yohane is able to switch between items that she has on-hand. The following items are the ones Yohane is able to "equip" by cycling through her items in her inventory:

1.) Tears of a Fallen Angel
2.) Noppo Bread
3.) Choco-mint ice cream *

Note that switching between items is counted as a movement, meaning enemies and will move despite Yohane being stationary. Likewise, Yohane is able to use an item on-hand except for the Choco-mint ice cream which activates automatically as long as she has it on-hand.

When Yohane does not have any items, it will be indicated as N/A and using an item when there are no items on hand counts as a movement (which acts as an invalid button press).

The default button controls for navigating through the item on-hand are the '[' button for previous item, ']' for the next item, and the space bar for using the item. Likewise, the quantity is displayed next to the item to indicate how many items they have in their inventory.

No item on hand

```
HP: 3 / 3                      Total Gold: 24 GP
Item on hand: N/A
```

Has 1x Tears of a Fallen Angel on hand

```
HP: 3 / 3                      Total Gold: 24 GP
Item on hand: Tears of a fallen angel
```

```
HP: 3 / 3                              Total Gold: 24 GP
Item on hand: Tears of a fallen angel (4)
```

Bats and Attacking

Bats are considered the main minions of the Siren that has taken over the mirror world of Numazu holding Yohane's fellow Aqours members. Therefore, bats are the main enemies that Yohane will have to deal with.

The behavior of bats vary, but they start of simple to deal with and get more complicated as Yohane clears more dungeons during the playthrough. Specifically, the table describes their behavior

1st Dungeon (Drops 5gp upon defeat)	Bats move AFTER every 2 movements made by Yohane. They can only move Up, Down, Left, or Right. The direction they move is random. However, if they are about to move and Yohane is on an adjacent tile, they will attack Yohane. Bats from the 1st dungeon deal .5 HP of damage.
2nd Dungeon (Drops 10gp upon defeat)	Bats move during every movement. They can move Up, Down, Left, or Right. The direction they move is random. However, if they are about to move and Yohane is on an adjacent tile, they will attack Yohane. Bats from the 2nd dungeon deal 1 HP of damage.
3rd Dungeon (Drops 15gp upon defeat)	Bats move during every movement. They can move in any direction, and diagonally. The direction they move is random. However, if they are about to move and Yohane is on an adjacent tile, they will attack Yohane. Bats from the 3rd dungeon deal 1.5 HP of damage.

To give you an illustration of the bats' movement, see the following example of a bat encounter in the 1st dungeon.

1.) In the illustration below, we can see Yohane and a bat nearby.	2.) Yohane moves to the right. As it's the first dungeon, bats only move after every 2 movements. This means that the bat is going to move after Yohane's next movement	3.) Yohane once again moves to the right. Yohane has moved twice now, so the bat now moves. It moves randomly and moves down as a result
| ```
*******
*.xv.b*
*Y....*
*.x...*
*******
``` | ```
*******
*.xv.b*
*.Y...*
*.x...*
*******
``` | ```
*******
*.xv..*
*..Y.b*
*.x...*
*******
``` |
| 4.) At this point, Yohane will once again move to the right and move adjacent to the bat. Do note that the bat will not move just about yet as it moves after every two moves made by Yohane | 5.) Should Yohane press right again, she will "attack" the bat, killing it and making the bat drop gold in it's place. Yohane can then move over the tile and pick up the gold | 6.) The bat is gone and Yohane now has more gold in her possession that she can use in Hanamaru's store later on |
| ```
*******
*.xv..*
*...Yb*
*.x...*
*******
``` | ```
*******
*.xv..*
*...Yg*
*.x...*
*******
``` | ```
*******
*.xv..*
*....Y*
*.x...*
*******
``` |

However, be wary of Yohane's movement when multiple bats are nearby. Accidentally jumping into a tile adjacent to a bat that is about to move results in damage. The following gives an explanation of such scenario

1.) In the illustration below, we can see Yohane and there are two bats	2.) Yohane moves to the left. As t's the first dungeon, once again, bats only move after every two movements. That means the bats are going to move after Yohane's next movement	3.) Yohane decides to move left. The bat further away from her moves left. HOWEVER, she ended up being adjacent to a bat below her. The bat then attacks Yohane and deals .5 HP of damage (the attacking bat turns into an uppercase B for that moment signifying it landed an attack). Note that bats that attack stay in place and do not move
| ```
*******
*.xv.b*
*..Y..*   HP 3 / 3
*bx...*
*******
``` | ```
*******
*.xv.b*
*.Y...*   HP 3 / 3
*bx...*
*******
``` | ```
*******
*.xvb.*
*Y....*   HP 2.5 / 3
*Bx...*
*******
``` |
| 4.) At this point, Yohane can either attack the bat that just damaged her (by pressing down), but the player gets flustered and moves up. The bat that previously attacked reverts to a lowercase b. Once again, the bats don't move as they move after every two movements made by Yohane | 5.) The player makes a mistake and ill-advisedly moves down again. As this is a turn when bats can move, the bat adjacent to Yohane lands another attack, damaging her again. Meanwhile, the bat further away from Yohane moves down randomly | 6.) The player finally gets their act together and attacks the bat that has been tormenting them by pressing down. The bat is killed and replaced with gold |
| ```
*******
*Yxvb.*
*.....*   HP 2.5 / 3
*bx...*
*******
``` | ```
*******
*.xv..*
*Y..b.*   HP 2 / 3
*Bx...*
*******
``` | ```
*******
*.xv..*
*Y..b.*   HP 2 / 3
*gx...*
*******
``` |

7.) Yohane decides against picking up the gold and decides to save it for later. The player then makes her move right. Again, bats will make a move after the next movement	8.) Yohane moves right again, into an incoming bat. The bat attacks Yohane and deals her .5 damage	9.) Yohane gets surprised and ends up pressing 'up' ('W') instead. This leads her to dig the wall above her. However, as bats move after every two movements, the bat does not attack her

```
*******
*.xv..*
*.Y.b.*   HP 2 / 3
*gx...*
*******
```
```
*******
*.xv..*
*..YB.*   HP 1.5 / 3
*gx...*
*******
```
```
*******
*.x...*
*..Yb.*   HP 1.5 / 3
*gx...*
*******
```

10.) Yohane decides to move up, forgetting about the bat. The bat, decides to move randomly again, considering Yohane is not adjacent to it when it makes it's move, so it moves right	11.) Thinking that it's time to make the bat pay, Yohane decides to move right towards the bat. However, as the bat moved in the previous turn, it won't move in this one. However…it will move in the next one	12.) Once again, Yohane ends up moving right, ill-advisedly towards the bat's incoming movement. The bat once again deals .5 damage to Yohane.

```
*******
*.xY..*
*....b*   HP 1.5 / 3
*gx...*
*******
```
```
*******
*.x.Y.*
*....b*   HP 1.5 / 3
*gx...*
*******
```
```
*******
*.x..Y*
*....B*   HP 1 / 3
*gx...*
*******
```

13.) Finally, Yohane decides to put the bat out of it's misery by correctly pressing down, and killing the bat. Gold replaces that bat's location	14.) At this point, Yohane is free to continue exploring. However, watch out for other bats!	Note: If Yohane ends up jumping into a tile being attacked by multiple bats, Yohane is only attacked by one. That means if two bats are able to attack her, only one of them will attempt to attack her.

```
*******
*.x..Y*
*....g*   HP 1 / 3
*gx...*
*******
```
```
*******
*.x..Y*
*....g*   HP 1 / 3
*gx...*
*******
```

Hanamaru's Store

In the mirror world, Hanamaru acts as a merchant who specializes in selling sweets, but is able to sell varying items to Yohane the more Aqours members she rescues.

The following are items that Yohane is able to purchase from Hanamaru

Item Name	Price	Description	Availability
Tears of a fallen angel	30GP	Heals Yohane .5 HP	Available at the start. Can only be purchased once for that playthrough.
Noppo Bread	100GP	Heals Yohane .5 HP	Available at the start.
Shovel Upgrade	300GP	Allows Yohane to dig spike walls without damage	Rescue Kanan. Can only be purchased once for each playthrough once unlocked.
Bat Tamer	400GP	Turns damage from all bats to a constant .5 HP damage	Rescue Riko. Can only be purchased once for each playthrough once unlocked.
Air Shoes	500GP	Allows Yohane to walk over water tiles. Prevents damage from standing on heat tiles.	Rescue You. Can only be purchased once for each playthrough once unlocked
Stewshine	1000GP	Increases Yohane's HP by 1 permanently	Rescue Mari. Can only be purchased once for each playthrough once unlocked
Mikan Mochi	1000GP	Increases Yohane's HP by 1 permanently	Rescue Chika. Can only be purchased once for each playthrough once unlocked
Kurosawa Macha	1000GP	Increases Yohane's HP by 1 permanently	Rescue Dia. Can only be purchased once for each playthrough once unlocked
Choco-Mint Ice Cream	2000GP	Saves Yohane from a fatal hit when on hand. Heals Yohane to full health afterwards	Rescue Ruby. Can only be purchased once for each playthrough once unlocked

```
Hanamaru: Yohane-chan, zura! What can I do for you today?

Total Gold: 365 GP

[1] Tears of a fallen Angel          30GP          [R]eturn
[2] Noppo Bread                      100GP




Choice:
```

Viewing Inventory

Players are also able to keep track of the items they have from the main menu. The only items that can be tracked are the Tears of a fallen angel, Noppo bread, and Choco-mint ice cream.

```
Lailaps: These are the items you have, Yohane!

HP: 4 / 5                            Total Gold: 365 GP
Items available

1. Tears of a fallen angel           x          0
2. Noppo bread                       x          2
3. Choco-mint ice cream              x          0

[R]eturn

Choice:
```

The Final Dungeon / Siren Battle

Once Yohane clears all 3 dungeons during the playthrough, the choices of which dungeon to travel to will be replaced with the singular option of facing the Siren

```
Lailaps: Yohane! It's time to face the Siren!

HP: 2 / 5                              Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

[1] Face the Siren of Numazu                   [I]nventory
                                               [S]ave and Quit
                                               [H]anamaru's Shop


Choice:
```

The layout of the Siren's dungeon is the same, but the placement of the switches will be random. In the battle, the player will be controlling BOTH Yohane AND Lailaps

```
Final Battle: Siren of the Mirror World!


HP: 2 / 5     Lailaps HP: 4 / 4         Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

*******************************************************************
*................*........S........*.....................*
*................*..............*......*.................*
*................*****************...................*
*..................................................*
*.O...O............................................*
*..................................................*
*..................................................*
*........................*.........................*
*..................................................*
*........................YL.........................*
*******************************************************************
```

During the final battle, Yohane and Lailaps spawn beside each other on a fixed location, always at the bottom of the dungeon. Here, the player is able to move both Lailaps and Yohane simultaneously. This means that, if Yohane moves up, Lailaps will also move up. If Yohane moves right, Lailaps also moves right. If, there is an obstacle blocking the character's movement, then only the character free from an obstacle will be able to move. An example will be if the

player makes Yohane move up, but there is a wall blocking Lailap's way up, then only Yohane will move up and Lailaps will stay still.

The flow of the battle is as follows:

1.) At the start of the battle, two switches (represented with the character '0') will spawn in two different locations.
2.) The player must use the impassable tiles ('*') to position Yohane and Lailaps to match the position of the switches
3.) Yohane and Lailaps must then trigger both switches simultaneously
4.) The switches will then disappear and another new pair of switches will spawn elsewhere
5.) This process is repeated a total of 3 times, at which point, the walls surrounding the Siren will break free
6.) The Siren will then move towards Yohane and Lailaps, and can move diagonally.
7.) If Yohane can land a successful attack against the Siren, the Siren disappears (and leaves behind 750gp) and an exit is spawned in the Siren's original place. Moving to this exit allows the player to win the playthrough!
8.) Otherwise, the Siren will reduce Yohane OR Lailap's HP to 0 in one hit (Unless Yohane has Ruby's ice cream, in which case she'll survive one hit, but will have her HP reduced to 0 if she gets hit again). Likewise, Lailaps CANNOT attack, so if the Siren lands a hit on Lailaps, it's game over!

In the midst of Yohane and Lailaps trying to activate the switches, the Siren will summon a bat enemy every 8 moves. The Bat will spawn randomly on a passable tile that is not occupied by a switch. The bats will function depending on the number of successful switch triggers Yohane and Lailaps perform. 0 switch triggers make bats act like they are in the 1st dungeon, 1 switch trigger makes bats act like they are in the 2nd dungeon, and 2 switch triggers make bats act like they are in the 3rd dungeon

NOTE: When Spawning the switches, the pair of switches should NOT be further than two rows and five columns away.

The following set of images demonstrate the moment Yohane and Lailaps trigger the switches for the third time, thereby releasing the Siren's barriers.

```
Final Battle: Siren of the Mirror World!

HP: 2 / 5      Lailaps HP: 3 / 4           Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

****************************************************************
*.....................*.........S.......*...................*
*.....................*................*...................*
*.....................*****************..................*
*..................................................*
*.............b.....................................b......*
*..................................................*
*..................................................*
*.......................*.............0Y............*
*.......................................0L.......*
*...................b..............................*
****************************************************************
```

Next move: Yohane (and Lailaps) moves left.

```
Final Battle: Siren of the Mirror World!

HP: 2 / 5      Lailaps HP: 3 / 4           Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

****************************************************************
*......................S..........................*
*..................................................*
*..................................................*
*...................................b..........*
*..................................................*
*...........b......................................*
*..................................................*
*.................*.............Y............*
*.................b....................L.......*
*..................................................*
****************************************************************
```

The barriers disappear once the switches are triggered for the third time. The Siren stops spawning in bats and in the next move, she will start moving towards Yohane.

Next move: Yohane & Lailaps move up, Siren moves diagonally SE

```
Final Battle: Siren of the Mirror World!

HP: 2 / 5      Lailaps HP: 3 / 4           Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

************************************************************
*..........................................................*
*.............................S............................*
*.......................................b.................*
*..........................................................*
*.............b............................................*
*..........................................................*
*..........................................................*
*.......................*...............Y.................*
*.....................b.......................L.........*
*..........................................................*
************************************************************
```

Next move: Yohane & Lailaps move up. Siren moves SE.

```
Final Battle: Siren of the Mirror World!

HP: 2 / 5      Lailaps HP: 3 / 4           Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

************************************************************
*..........................................................*
*...............................................b..........*
*........................S.................................*
*................b.........................................*
*..........................................................*
*..........................................................*
*.......................................Y.................*
*.....................b*......................L.........*
*..........................................................*
*..........................................................*
************************************************************
```

Next move: Yohane & Lailaps move up again. Siren moves SE.

```
Final Battle: Siren of the Mirror World!


HP: 2 / 5       Lailaps HP: 3 / 4              Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

************************************************************
*..........................................................*
*..........................................................*
*................b...........................b.............*
*.............................S............................*
*..........................................................*
*......................................Y..................*
*......................b......................L...........*
*.......................*..................................*
*..........................................................*
*..........................................................*
*..........................................................*
************************************************************
```

Next move: Yohane and Lailaps move up. Siren continues to move SE.


```
Final Battle: Siren of the Mirror World!


HP: 2 / 5       Lailaps HP: 3 / 4              Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

*************************************************************
*..........................................................*
*..............b..........................b...............*
*..........................................................*
*..........................................................*
*.........................S.........Y....................*
*....................b......................L...........*
*...................*......................................*
*..........................................................*
*..........................................................*
*..........................................................*
*************************************************************
```

Next move: Yohane and Lailaps move left. Now that the Siren is on the same row as Yohane, it now move right

```
Final Battle: Siren of the Mirror World!

HP: 2 / 5      Lailaps HP: 3 / 4           Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

************************************************************
*..................b......................b.............*
*........................................................*
*........................................................*
*........................................................*
*......................b......S.........Y................*
*.......................................L................*
*........................................................*
*.......................*................................*
*........................................................*
*........................................................*
************************************************************
```

Next move: Yohane and Lailaps moves left. Siren moves right.

```
Final Battle: Siren of the Mirror World!

HP: 2 / 5      Lailaps HP: 3 / 4           Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

************************************************************
*...................................b..................*
*..............b.........................................*
*........................................................*
*..................b.....................................*
*.............................S.....Y...................*
*....................................L..................*
*........................................................*
*.......................*................................*
*........................................................*
*........................................................*
************************************************************
```

Next move: Yohane and Lailaps move left again. Siren continues to move right.

```
Final Battle: Siren of the Mirror World!


HP: 2 / 5      Lailaps HP: 3 / 4           Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

*********************************************************
*.........................................b............*
*......................................................*
*..............b.......................................*
*....................b.................................*
*........................S....Y........................*
*..................................L...................*
*......................................................*
*...................*..................................*
*......................................................*
*......................................................*
*********************************************************
```

Next move: Yohane and Lailaps move left. Siren continues to move right.

```
Final Battle: Siren of the Mirror World!


HP: 2 / 5      Lailaps HP: 3 / 4           Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

*********************************************************
*......................................................*
*.............b........................b...............*
*......................................................*
*......................................................*
*..................b.........S..Y......................*
*.................................L....................*
*......................................................*
*...................*..................................*
*......................................................*
*......................................................*
*********************************************************
```

Next move: Yohane and Lailaps decide to move up. The Siren then moves NE as a result.

```
Final Battle: Siren of the Mirror World!


HP: 2 / 5      Lailaps HP: 3 / 4            Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

**************************************************************
*...........b............................b................*
*........................................................*
*........................................................*
*...................................S.Y..................*
*.............................................L..........*
*.....................b...................................*
*........................................................*
*.......................*................................*
*........................................................*
*........................................................*
**************************************************************
```

NOTE: At this current position, If Yohane moves left, that will leave her in a tile adjacent to the Siren. This will mean that the Siren WILL hit Yohane. As Yohane does NOT have the choco-mint ice cream on hand, that will lead to a game over.

Thus, the safe route would be either to move down, move right, or move up.

Next move: Yohane and Lailaps move up. Siren moves NE as a result.

```
Final Battle: Siren of the Mirror World!


HP: 2 / 5      Lailaps HP: 3 / 4            Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

********************************************************
*......................................................*
*..................b...........................b........*
*...................................SY..................*
*.....................................L.................*
*.......................................................*
*.......................................................*
*..................b....................................*
*...............*.......................................*
*.......................................................*
*.......................................................*
********************************************************
```

Now Yohane and the Siren are adjacent to each other. The correct move here is to press left and attack the Siren. If Yohane moves Up or Down, the Siren will be able to hit her, reducing her HP to 0 and causing a game over. Moving right, however, is safe, but the Siren will just move right again, and doing so can cause the bat above Lailaps to riskily move adjacent to her.

Next move: Yohane attacks the siren (Presses left), Lailaps moves left as a result, Siren defeated!

```
Final Battle: Siren of the Mirror World!


HP: 2 / 5      Lailaps HP: 3 / 4          Total Gold: 280 GP
Item on hand: Tears of a Fallen Angel

*******************************************************************
*................................E...............................*
*...........g.................................g..................*
*.............................................gY..................*
*...........................................L..................*
*.................................................................*
*.................................................................*
*.................g...............................................*
*...................................*...........................*
*.................................................................*
*.................................................................*
*******************************************************************
```

Pressing left causes Yohane to attack the Siren, defeating it. Lailaps, however, moves left as there is nothing obstructing her movement.

With the defeat of the siren, all the bats fall and the Siren leaves behind 750gp from her location. The Exit spawns and the player ends up winning the game!

New Game+

Once the player has won the game, they are free to start a new game. Therefore, the [C]ontinue in the main menu will be replaced with [N]ew Game.

The following are the things that carry over whenever a player undertakes New Game +

1.) The Aqours members rescued in the previous playthrough(s)
2.) Gold obtained
3.) Progress towards achievements
4.) Amount of Noppo-bread and Tears of a Fallen Angel

The following are the things that DO NOT carry over

1.) Other items purchased, such as the upgrades and the Choco-mint ice cream
2.) Maximum HP. It resets back to 3 at the start of every playthrough

Game Over

A player encounters a game over if Yohane's HP (or Lailaps' during the final boss battle) hits 0.
The player is informed that they got a game over and what ended up killing them.

```
Dungeon #2: Yasudaya Ryokan
Floor 2 of 3

HP: 0 / 5                                    Total Gold: 5212 GP
Item on hand: Noppo Bread
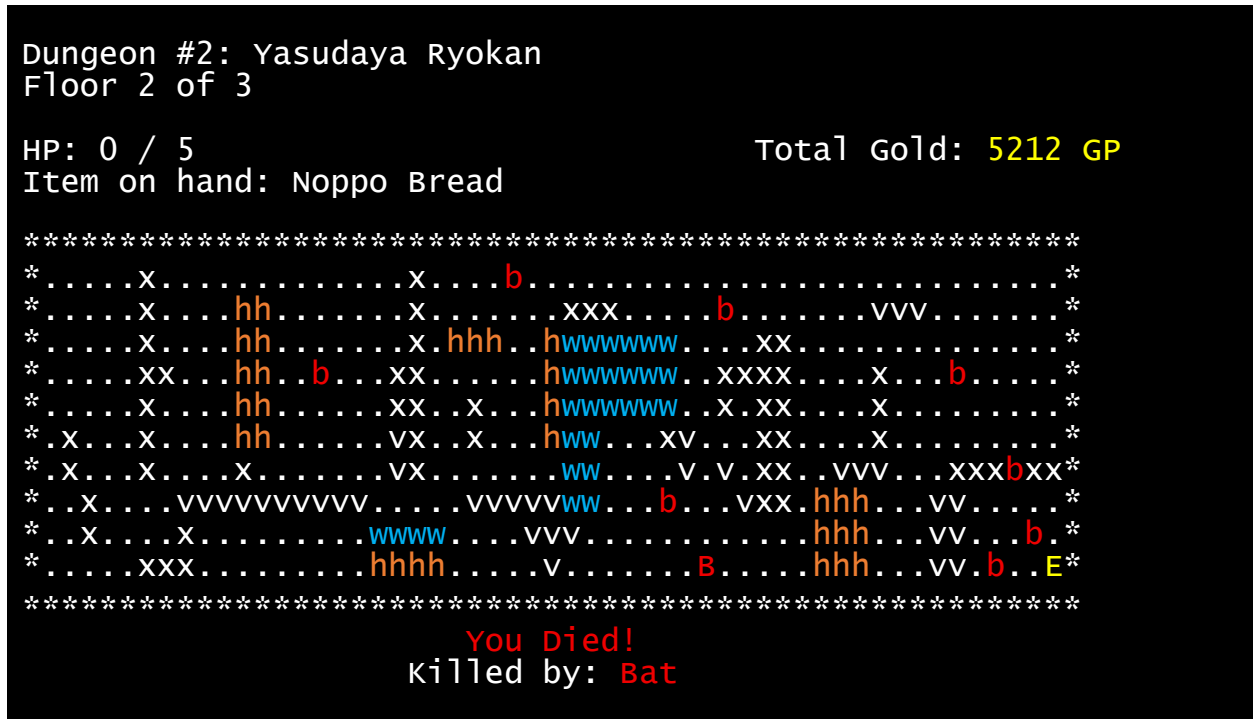
***************************************************************
*.....x...............x....b................................*
*.....x....hh.......x......xxx.....b.......vvv.......*
*.....x....hh.......x.hhh..hwwwwww...xx.............*
*.....xx...hh..b...xx......hwwwwww..xxxx....x...b.....*
*.....x....hh......xx..x...hwwwwww..x.xx....x.......*
*.x...x....hh......vx..x...hww...xv...xx....x.......*
*.x...x....x.......vx.......ww....v.v.xx..vvv...xxxbxx*
*..x....vvvvvvvvvv.....vvvvvww...b...vxx.hhh...vv.....*
*..x...x.........wwww....vvv...........hhh...vv...b.*
*.....xxx........hhhh....v.......B.....hhh...vv.b..E*
***************************************************************
                    You Died!
              Killed by: Bat
```

The following are obstacles that can considerably cause a game over:

1.) Bat
2.) Heat Tiles
3.) Spike Walls
4.) Siren

Should a player end up with a Game Over, the following are the things that are saved and not
lost:

1.) The Aqours members that have been rescued in the playthrough (and previous
    playthroughs)
2.) Gold obtained
3.) Progress towards achievements
4.) Amount of Noppo-bread and Tears of a Fallen Angel

The following are the things that reset during the next playthrough

1.) The number of Aqours members
2.) The upgrades purchased in that playthrough
3.) Maximum HP is reset back to 3

Achievements Module

As the players travel through the mirror world and embark on multiple playthroughs, they are awarded with "Achievements" that they can view through the achievements module at the main screen. These are as follows:

Achievement Name	Description
Yohane Descends!	Cleared first dungeon
Mikan Power!	Rescued Chika for the first time
Riko-chan BEAM!	Rescued Riko for the first time
Yousoro!	Rescued You for the first time
It's the future, zura!	Rescued Hanamaru for the first time
Ganbaruby!	Rescued Ruby for the first time
Buu-buu desu wa!	Rescued Dia for the first time
Hug!!!	Rescued Kanan for the first time
Shiny!	Rescued Mari for the first time
In This Unstable World!	Beat the Final boss for the first time
One more sunshine story!	Rescued Chika twice
Pianoforte Monologue!	Rescued Riko twice
Beginner's Sailing!	Rescued You twice
Oyasuminasan!	Rescued Hanamaru twice
Red Gem Wink!	Rescued Ruby twice
White First Love!	Rescued Dia twice
Sakana ka Nandaka!	Rescued Kanan twice
New Winding Road!	Rescued Mari twice
Deep Resonance!	Beat the Final boss twice
No. 10!	Clear 10 dungeons
CYaRon!	Rescued Chika, You, and Ruby (Not necessarily in one playthrough)
AZALEA!	Rescued Hanamaru, Dia, and Kanan (Not necessarily in one playthrough)
Guilty Kiss!	Rescued Riko and Mari (Not necessarily in one playthrough)
Eikyuu Hours!	Have Yohane rescue all Aqours members for the first time

Aozora Jumping Heart!	Clear a dungeon without incurring any damage
Mitaiken Horizon!	Accumulate a total of 5000G spent on Hanamaru's stores across multiple playthroughs
Ruby-chan! Hai? Nani ga suki?	Get saved by a fatal blow from Ruby's choco-mint ice cream item.
Step! ZERO to ONE!	Complete a playthrough with 0G on-hand at the end

The player is able to keep track of the achievements that they have earned throughout the game and identify the ones that they have yet to earn. Players are able to see the description of every achievement to guide them on how they can achieve them.

The following are sample screens showing the achievements module section

```
******************************************************************
                    Achievements module
                    Obtained: 7 / 28
******************************************************************
[1] Yohane Descends!                              EARNED!
[2] Mikan Power!                                  EARNED!
[3] Riko-chan BEAM!                               EARNED!
[4] Yousoro!                                      EARNED!
[5] It's the future, zura!                        EARNED!
[6] Ganbaruby!                                    NOT EARNED
[7] Buu-buu desu wa!                              NOT EARNED
[8] Hug!                                          NOT EARNED

Page 1 of 3

[N]ext Page
[P]revious Page
[R]eturn to Main Menu

Choice:
```

```
**************************************************************
                    Achievements module
                     Obtained: 7 / 28
**************************************************************
[1]  Shiny!                                    NOT  EARNED
[2]  In this unstsable world!                  NOT  EARNED
[3]  One more sunshine Story!                  NOT  EARNED
[4]  Pianoforte Monologue!                     NOT  EARNED
[5]  Beginner's Sailing!                       NOT  EARNED
[6]  Oyasuminasan!                             NOT  EARNED
[7]  Red Gem Wink!                             NOT  EARNED
[8]  White First Love!                         NOT  EARNED

Page 2 of 3

[N]ext Page
[P]revious Page
[R]eturn to Main Menu

Choice:
```

```
**************************************************************
                    Achievements module
                     Obtained: 7 / 28
**************************************************************
Achievement Name: Yohane Descends!

Status: EARNED!

Date Earned: 6-02-2025 14:12

Description:
Cleared first dungeon


[R]eturn to Achievements Module

Choice:
```

```
****************************************************************
                   Achievements module
                    Obtained: 7 / 28
****************************************************************
Achievement Name: Hug!

Status: NOT EARNED

Description:
Rescued Kanan for the first time


[R]eturn to Achievements Module

Choice:
```

Unlocking Achievements

Achievements are unlocked in-game. Whenever the player triggers an action that enables them to unlock one of the achievements, they have to be notified in-game at the top of the screen. Should the player unlock multiple achievements in one sitting, both achievements have to be displayed at the same time. An example is on the next page where the player is notified of an achievement unlocking during an in-game cutscene after Hanamaru is rescued for the first time and the first time the player managed to clear a dungeon.

```
Achievement unlocked: Yohane Descends!
Achievement unlocked: It's the future, zura!

*********************************************************
                    Dungeon Cleared!
            Shougetsu Confectionary Completed!
                Hanamaru Kunikida rescued!
*********************************************************
Hanamaru: Yohane-chan, zura! You're here!

Yohane: Hanamaru! We have to get out of here quickly!

Hanamaru: Oh? I was wondering what this place was and why there
are bats everywhere, zura!

Yohane: Seems like there's a Siren that wants to take your
voices and is holding you in this dimension so that your
counterparts in the real world can't sing!

Hanamaru: Really? That sounds terrifying, zura. What have we
got to do?

Yohane: First, we have to get out of here, Zuramaru! I know the
way out.

Hanamaru: Lead the way, zura!

[R]eturn
```

NOTE: Once a player performs the task to unlock an achievement multiple times, only the first time will trigger the display and the action unlocking of that achievement.

Character Profile(s)

Name	Description	Appearance	Appearance (Mirror World)
Yoshiko Tsushima (Yohane)	Yoshiko is a 1st year member of the idol group Aqours, who claims she's a fallen angel who was cast out of heaven. This persona enabled her alternate self in the mirror world to possess magical powers, capable of protecting Numazu from supernatural threats. *cv. Aika Kobayashi*		
Lailaps	Lailaps exists in the mirror world as Yohane's loyal wolf companion. She acts as the voice of reason and guides Yohane throughout her mission. *cv. Yoko Hikasa*		
Chika Takami	Chika is a 2nd year and the founding member of Aqours. Her family runs a Ryokan inn, similarly to her mirror world self, where she specializes in her family's signature Mikan Mochi! *cv. Anju Inami*		
You Watanabe	You is a 2nd year member of Aqours, who is Chika's childhood friend well-known for her athletic prowess. In the mirror world, she's a post-lady with equipment that allows her to travel far and wide through the land of Numazu. *cv. Saito Shuka*		

Riko Sakurauchi	Riko is a 2nd year member of Aqours who transferred to Uchiura from Tokyo. As the pianist and main composer of the group, her diligence carries over to the mirror world where she acts as a zoologist capable of understanding and manipulating beast behavior. *cv. Rikako Aida*		
Hanamaru Kunikida	Hanamaru is a 1st year member of Aqours, well-known for her fondness for food, books, and her tendency to say "zura" at the end of every sentence. She's a travelling merchant in the mirror world who specializes in selling sweets and all sorts of goodies to help adventurers along their journey. *cv. Kanako Takatsuki*		
Ruby Kurosawa	Ruby is a 1st year member of Aqours, who is Hanamaru's childhood friend. This carries over to the mirror world where Ruby, now a fairy, helps Hanamaru by supplying equipment to her shop. She also bestows magic in her sweet treats, some of which is rumored to be "life-savingly" delicious. *cv. Ai Furihata*		
Dia Kurosawa	Dia is a 3rd year member of Aqours and is Ruby's older sister. As she's the student council president of Uranohoshi high school, her mirror world self is the chief of staff of the Numazu Administrative Bureau. However, her mirror self is known to be		

	highly fond of anything macha. *cv. Arisa Komiya*		
Kanan Matsuura	Kanan is a 3rd year member of Aqours, who runs a dive shop with her family. Her mirror world self is a mechanic who creates powerful and useful gadgets to make working and performing tasks in Numazu more convenient for citizens. *cv. Nanaka Suwa*		
Mari Ohara	Mari is a 3rd year member of Aqours. As part of an affluent and wealthy family, she has been designated as the school director of Uranohoshi high school. Her mirror self is no different, being a demon lord who commands a small horde of friendly creatures in the island of Awashima *cv. Aina Suzuki*		
Siren of the Mirror World	Nobody has seen her and lived to tell the tale. It has been rumored that the Siren sings with a voice that is irresistible enough to lure unsuspecting individuals to their doom. Recently, this Siren has attempted to go beyond her reality and influence even the real world, starting with taking voices of idols all around the world in an attempt to enhance her own voice	???????????????????	??????????????????

CCPROG2 MP Directives

How to Approach the Machine Project

Step 1: Problem analysis and algorithm formulation

Read the MP Specifications again! Identify clearly what are the required information from the user, what kind of processes are needed, and what will be the output (s) of your program. Clarify with your professor any issues that you might have regarding the machine project.

When you have all the necessary information, identify the necessary functions that you will need to modularize the project. Identify the required data of these functions and what kind of data they will return to the caller. Write your algorithm for each of these modules/functions as well as the algorithm for your main program.

Step 2: Implementation

In this step, you are to translate your algorithm into proper C statements. While implementing, you are to perform the other phases of program planning and design (discussed in the other steps below) together with this step.

Follow the coding standard indicated in the course notes (Modules section in AnimoSpace).

You may choose to type your program in a text editor or an IDE (i.e. Dev-C IDE) at this point. Note that you are expected to use statements taught in class. You can explore other libraries and functions in C as long as you can clearly explain how these work. You may also use arrays, should these be applicable and you are able to properly justify and explain your implementation using these. For topics not covered, it is left to the student to read ahead, research, and explore by himself.

<u>Note though that you are NOT ALLOWED to do the following:</u>
- to declare and use global variables (i.e., variables declared outside any function),
- to use goto statements (i.e., to jump from code segments to code segments),
- to use the break or continue statement to exit a block. Break statement can only be used to break away from the switch block,
- to use the return statement or exit statement to prematurely terminate a loop or function or program, • to use the exit statement to prematurely terminate a loop or to terminate the function or program, and • to call the main() function to repeat the process instead of using loops.

It is best that you perform your coding "incrementally." This means:

- Dividing the program specification into subproblems, and solving each problem separately according to your algorithm;
- Code the solutions to the subproblems one at a time. Once you're done coding the solution for one subproblem, apply testing and debugging.

Documentation

While coding, you have to include internal documentation in your programs. You are expected to have the following: • File comments or Introductory comments
- Function comments
- In-line comments

Introductory comments are found at the very beginning of your program before the preprocessor directives. Follow the format shown below. Note that items in between < > should be replaced with the proper information.

```
/*
     Description: <Describe what this program does briefly>
     Programmed by: <your name here> <section>
     Last modified: <date when last revision was made>
     Version: <version number>
     [Acknowledgements: <list of sites or borrowed libraries
     and sources>]
*/
     <Preprocessor directives>

     <function implementation>

     int main()
     {
      return 0;
     }
```

Function comments precede the function header. These are used to describe what the function does and the intentions of each parameter and what is being returned, if any. If applicable, include pre-conditions as well. Pre conditions refer to the assumed state of the parameters. Follow the format below when writing function comments:

```
/* <Description of function>
      Precondition: <precondition / assumption> @param <name> <purpose>
      @return <description of returned result> */
<return type>
<function name> (<parameter list>)
      :
```

Example:

```
* This function computes for the area of a triangle Precondition:
 base and height are non-negative values @param base is the base
 measurement of the triangle in cm @param height is the height
 measurement of the triangle in cm @return the resulting area of the
 triangle
 */
float
getAreaTri (float base,
          float height)
{
   ...
}
```

In-Line Comments are ot**her comments in major parts of the code. These are expected to explain the purpose or algorithm of groups of related code, esp. for long functions.**

STEP 3: TESTING AND DEBUGGING

SUBMIT THE LIST OF TEST CASES YOU HAVE USED. For each feature of your program, you have to fully test it before moving to the next feature. Sample questions that you should ask yourself are:

1. What should be displayed on the screen if the user inputs an order?
2. What would happen if I input incorrect inputs? (e.g., values not within the range) 3. Is my program displaying the correct output?
4. Is my program following the correct sequence of events (correct program flow)? 5. Is my program terminating (ending/exiting) correctly? Does it exit

when I press the command to `quit`? Does it exit when the program's goal has been met? Is there an infinite loop? 7. and others...

IMPORTANT POINTS TO REMEMBER:

1. You are required to implement the project using the C language (C99 and NOT C++). Make sure you know how to compile and run in both the IDE (DEV-C++) and the command prompt (via

    `gcc –Wall -std=c99 <yourMP.c> -o <yourExe.exe>`

2. The implementation will require you to:
    - Create and Use Functions
        Note: Non-use of self-defined functions will merit a grade of **0** for the **machine project**. Too few self-defined functions may merit deductions. A general rule is to create a separate function for each option described above, unless some features are too similar that one function can serve the purpose for two [or more] of the options. Note that functions whose tasks are only to display are not included in the count for creating user-defined functions.
    - Appropriately use conditional statements, loops and other constructs discussed in class (Do not use brute force solution. **You are not allowed to use goto label statements, exit statements. You are required to pass parameters to functions and not allowed to declare global or static variables.**) Refer to Step 2 on Implementation for other details and restrictions.
    - Consistently employ coding conventions
    - Include internal documentation (i.e., comments)

3. Deadline for the project is the **7:59AM of July 28, 2025 (Monday)** via submission through **AnimoSpace**. After this time, submission facility is locked and thus no MP will be accepted anymore and this will result to a **0.0** for your machine project.
    4. The following are the deliverables:

Checklist:
❑ Upload in AnimoSpace by clicking **Submit Assignment** on Machine Project and adding the following files:
      ❑ source code*
      ❑ test script**
❑ email the softcopies of everything as attachments to **YOUR own email address** on or before the deadline

---

5. **MP Demo:** You will demonstrate your project on a specified schedule during the last weeks of classes. Being unable to show up on time during the demo or being unable to answer convincingly the questions during the demo will merit a grade of **0.0** for the **MP**. The project is initially evaluated via black box testing (i.e., based on output of running program). Thus, if the program does not compile successfully using gcc - Wall - std=c99 and execute in the command prompt, a grade of 0 for the project will be incurred. However, a fully working project does not ensure a perfect grade, as the implementation (i.e., correctness and compliance in code) is still checked.

6. Any requirement not fully implemented and instruction not followed will merit deductions.

7. This is a **pair project**. Working in collaboration, asking other people's help (who is not your pair), and/or copying other people's work are considered as cheating. Cheating is punishable by a grade of **0.0** for CCPROG2 course, aside from which, a cheating case may be filed with the Discipline Office.

8. The above description of the program is the basic requirement. A maximum of 10 points will be given as bonus. Sample additional features could be:

(a) More enemies (Skeletons and Dragons) and added behavior
(b) Other game mode (Ex: Vow of Poverty Mode = Picking up gold is instant game over)
(c) Proper usage of colors, timestamps of achievements, added profile (switching between player profile)

Note that any additional feature not stated here may be added but **should not conflict with whatever instruction was given in the project specifications**. Bonus points are given upon the discretion of the teacher, based on the difficulty and applicability of the feature to the program. Note that **bonus points can only be credited if all the basic requirements are fully met** (i.e., complete and no bugs).

HONESTY POLICY AND INTELLECTUAL PROPERTY RIGHTS

Honesty policy applies. Please take note that you are NOT allowed to borrow and/or copy-and-paste – in full or in part any existing related program code from the internet or other sources (such as printed materials like books, or source codes by other people that are not online). **You should develop your own codes from scratch by yourself.**
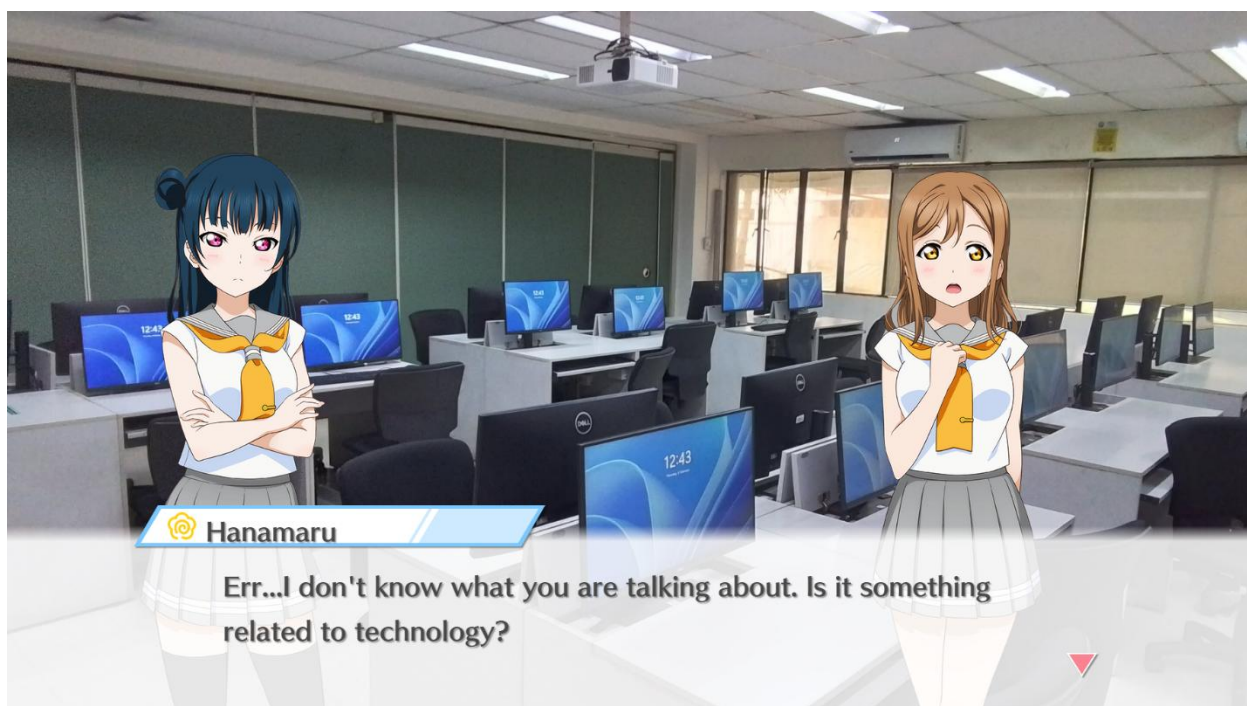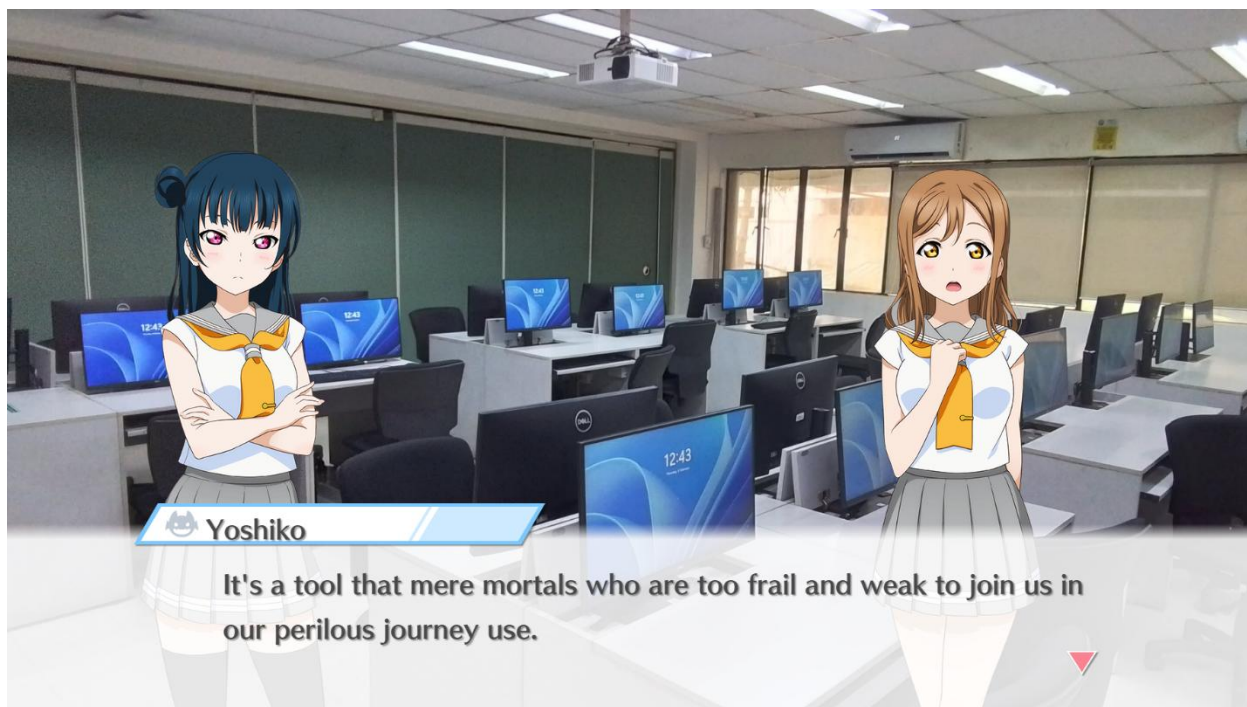
Likewise, using Generative AI for any modules within the codes in the project is counted as cheating. Codes used by Generative AI are a result of training data from other programmers, thus it's the same as using someone else's code that is not yours.
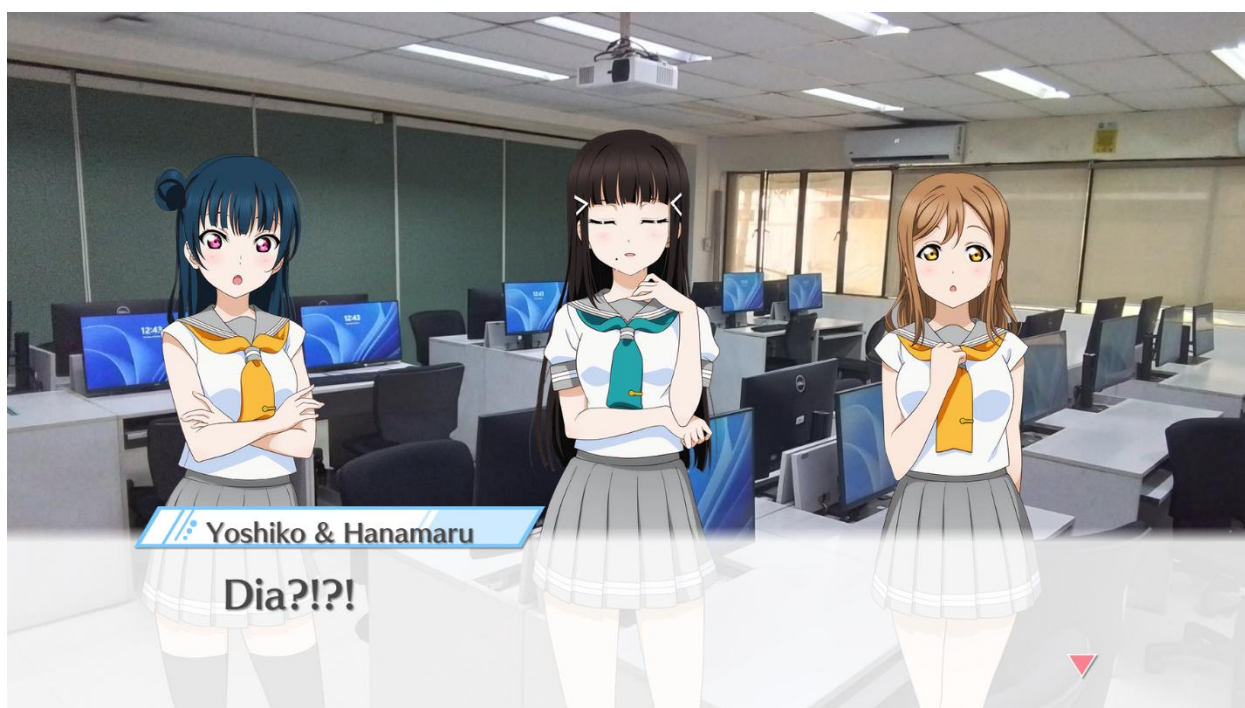
Bonus

Yoshiko

Zuramaru, did you hear about the dude who used ChatGPT to write his entire project?

Hanamaru

ChatGPT? What's that.

Yoshiko

It's a tool that mere mortals who are too frail and weak to join us in our perilous journey use.

Hanamaru

Err...I don't know what you are talking about. Is it something related to technology?

Yoshiko

Fufufu...fear not, Zuramaru!
I, Yohane the fallen angel will guarantee that only those who are worthy will join us in our journey to save idols everywhere!

Hanamaru

O-okay. Whatever you say, zura.

Dia

Sorry to interrupt, but could we get a move on already?

Kanan and Mari need their voices back.

Yoshiko & Hanamaru

Dia?!?!

Dia

Also remember, our journey is going to be long and tedious but we are doing this for idols everywhere.

Dia

That being said...
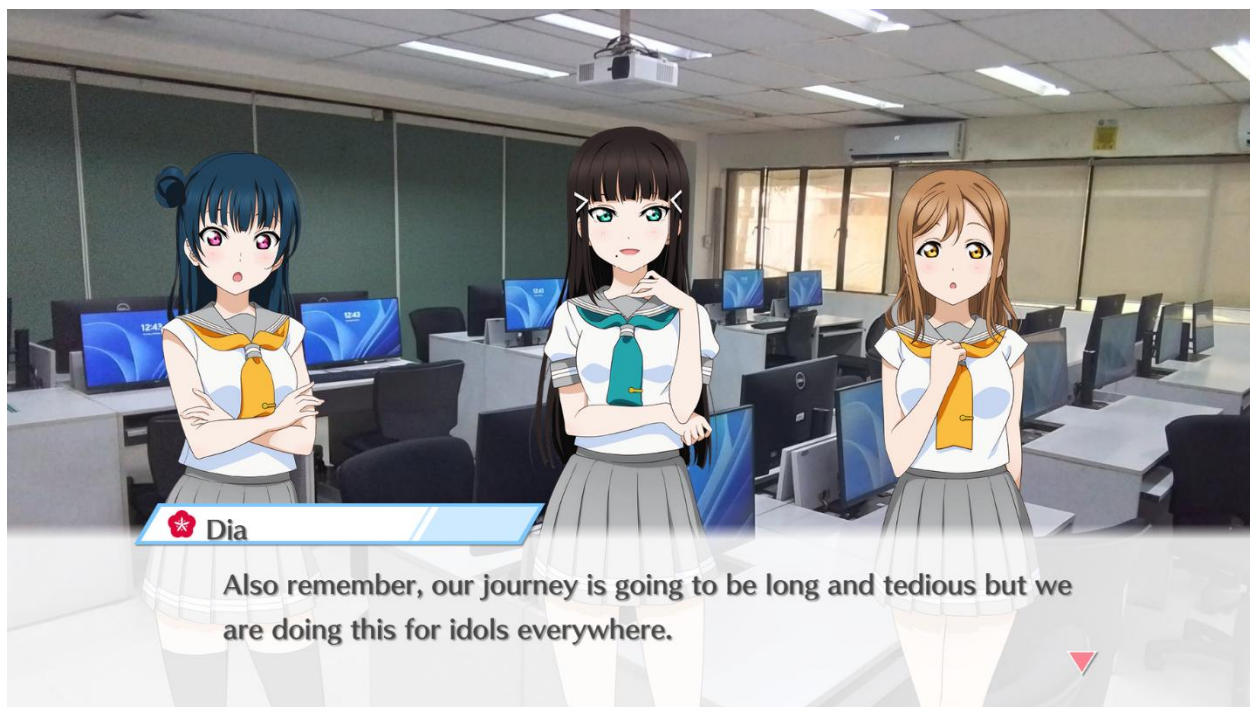
Dia

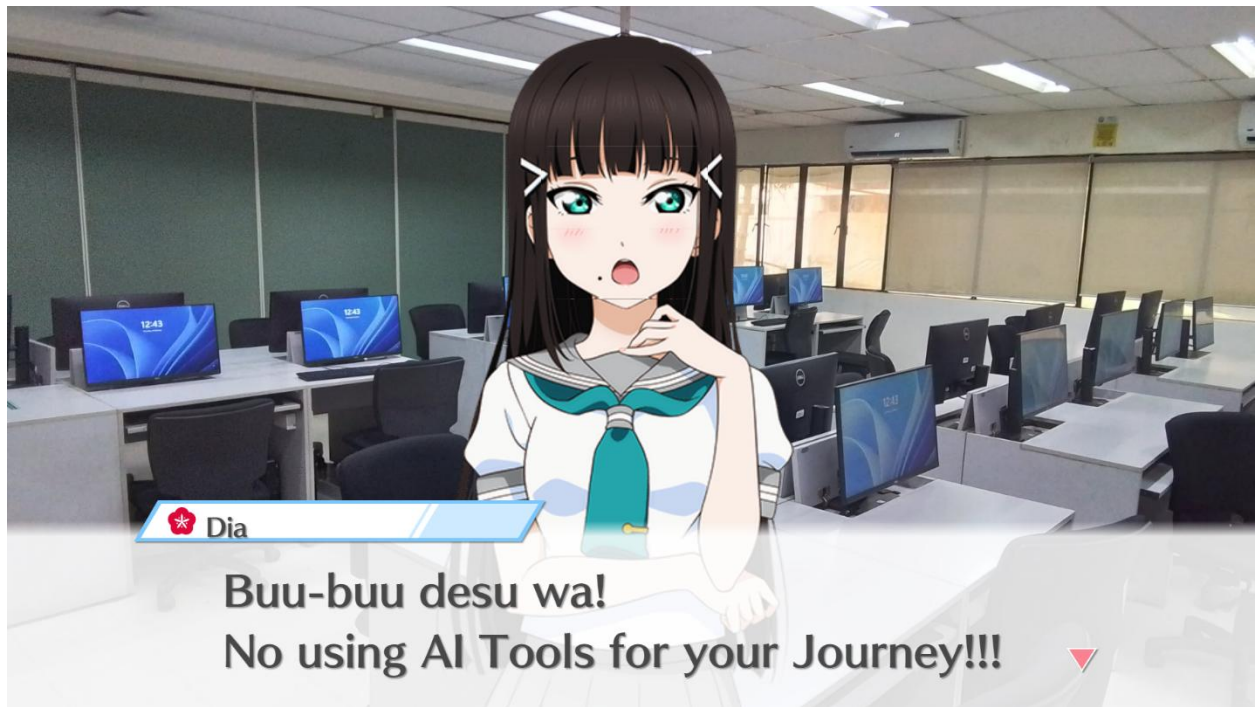Buu-buu desu wa!
No using AI Tools for your Journey!!!

This project is dedicated to Aqours' 10th anniversary in preparation for their Finale Live.
From 0 to 1 to 100, to 10 years, to eternal.