

# Circus

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# Aims and Objectives

- To create a game where the main character faces a variety of enemies which use different methods of attack.
- The MC fires projectiles as a means of attack.
- A game which followed a storyline, where the main character interacts via dialogue with the other characters.
- Have original hand-drawn characters (sprites).
- A life-based game where the user has multiple but an expendable number of lives to win.

# Theory – Vectors

- Used throughout the code.
- Calculates where different objects are.
- Moves objects throughout the screen.

# Theory – Vectors

- Screen uses absolute positioning.

- Top-left corner of screen acts (0,0).

- Screen width:

- Greatest visual x coordinate.

- Screen height:

- Greatest visual y coordinate.

# Theory – Vectors

## ■ Character movement:

- Adding speed vectors to the position vector of the character object.
  - Helps make characters move around the screen.
- It can be added automatically:
  - Every game cycle (after one enemy bullet has been shot).
  - After an event (e.g., pressing a button).

# Theory – Sprite sheets

## ■ Adding animation:

- Cycle through a series of photos.
- Loading the individual images causes:
  - Lag.
  - Decreased performance.
- Use sprite sheets instead of individual images.
  - All frames of animations within one image.
  - They can be loaded into initialiser.

# Theory – Sprite sheets

## ■ Separating sprite sheet frames:

- Find centre of each frame.
  - To be found using calculations:
    - Sprite sheet dimensions.
    - Number of columns and rows.



# Theory – Collisions

## ■ Colliders:

- Act like a border around an object instead of a point around a vector.

## ■ Circle-bordered collider:

- $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} < r_1 + r_2.$

## ■ Square-bordered collider:

- $x_1 - r_1 > x_2 + r_2$  and  $x_1 + r_1 < x$  and  $y_1 - r_1 > y_2 - r_2.$



# Theory – Projectiles

## ■ Projectile objects.

- Needed for player or enemy weapon.

- Object must have:

  - Initial position.

  - Initial speed.

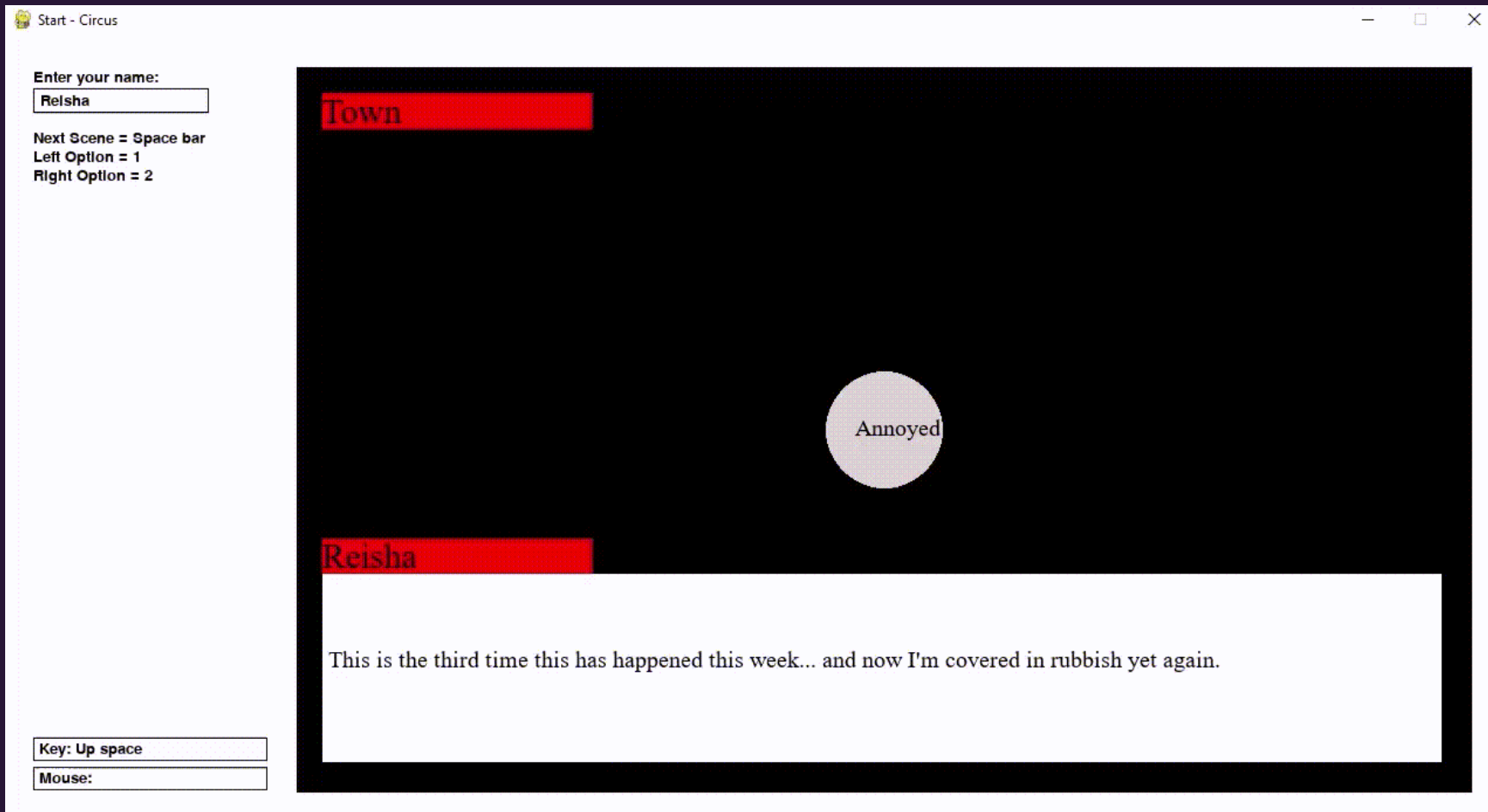
  - Launch method (moving the projectile across the screen).

  - Draw method (optional).

# Theory - Summary

- Four concepts used to implement certain features.
- Elements compared to each other.
- Through these comparisons, able to start certain conditions:
  - Player death.
  - Enemy death.
  - Transition to next scene.

# Dialogue – Breakdown



Beginning of the  
dialogue section.

# Dialogue – Breakdown

**Start - Circus**

Enter your name:

Reisha

Next Scene = Space bar

Left Option = 1

Right Option = 2

Able to input name, other characters call you by name.

Directions on the top left of the screen.

Helps to navigate throughout dialogue section.

# Dialogue – Breakdown

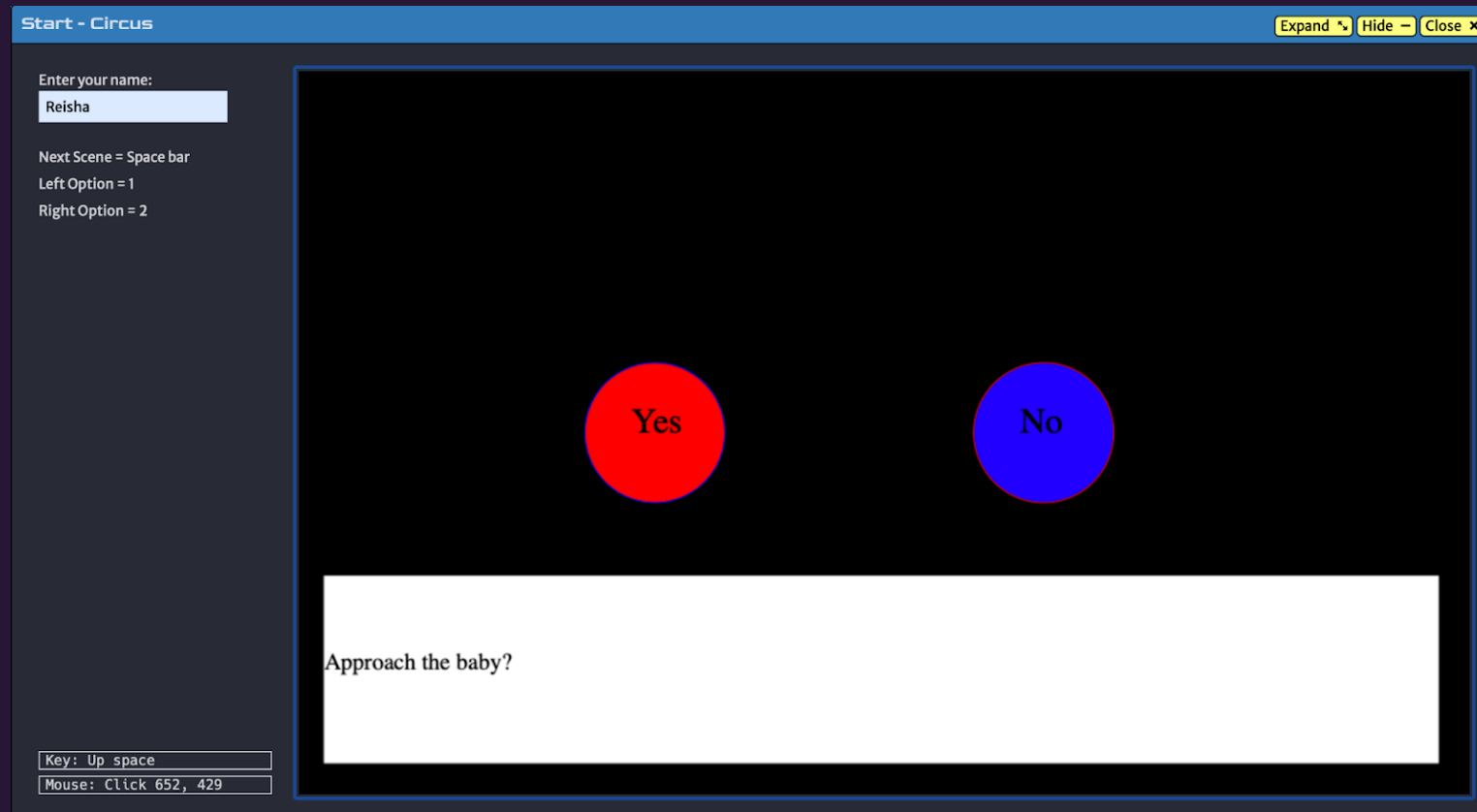


Two characters in a scene.

Emotions can change.

Characters are differentiated using colours.

# Dialogue – Options



Example of a choice within the game.

Directions on top left of screen.

# Dialogue – Missing visual elements

- Incomplete dialogue section.
  - Time constraints.
  - Other circumstances.
  - Sprites and backgrounds incomplete.
  - Actual dialogue incomplete.

# Player – General Info

## 🃏 Storyline:

- 🃏 The player is kidnapped, and the player is forced to become a clown and perform.
- 🃏 Player must escape by defeating troupe members.

## 🃏 Fighting:

- 🃏 Armed with deadly projectiles – playing cards.
- 🃏 Player has five lives.



# Player – Controls

## Controls

A = Move left

W = Jump

D = Move right

Right arrow key = Shoot horizontally

Up arrow key = Shoot upwards



# Enemy – Ventriloquist



The ventriloquist is the first enemy you encounter.

The controls are on the frame of the screen.

You have 5 lives on the bottom right of the screen.

Your points are displayed above.

You begin in the middle.

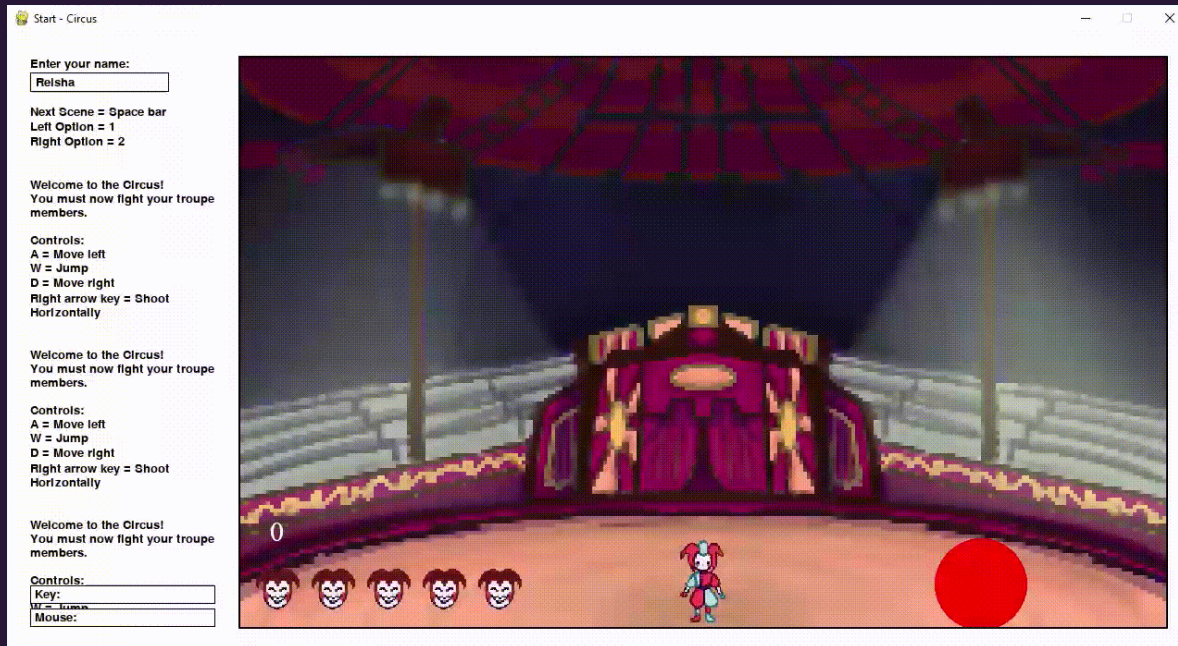


# Enemy – Ventriloquist

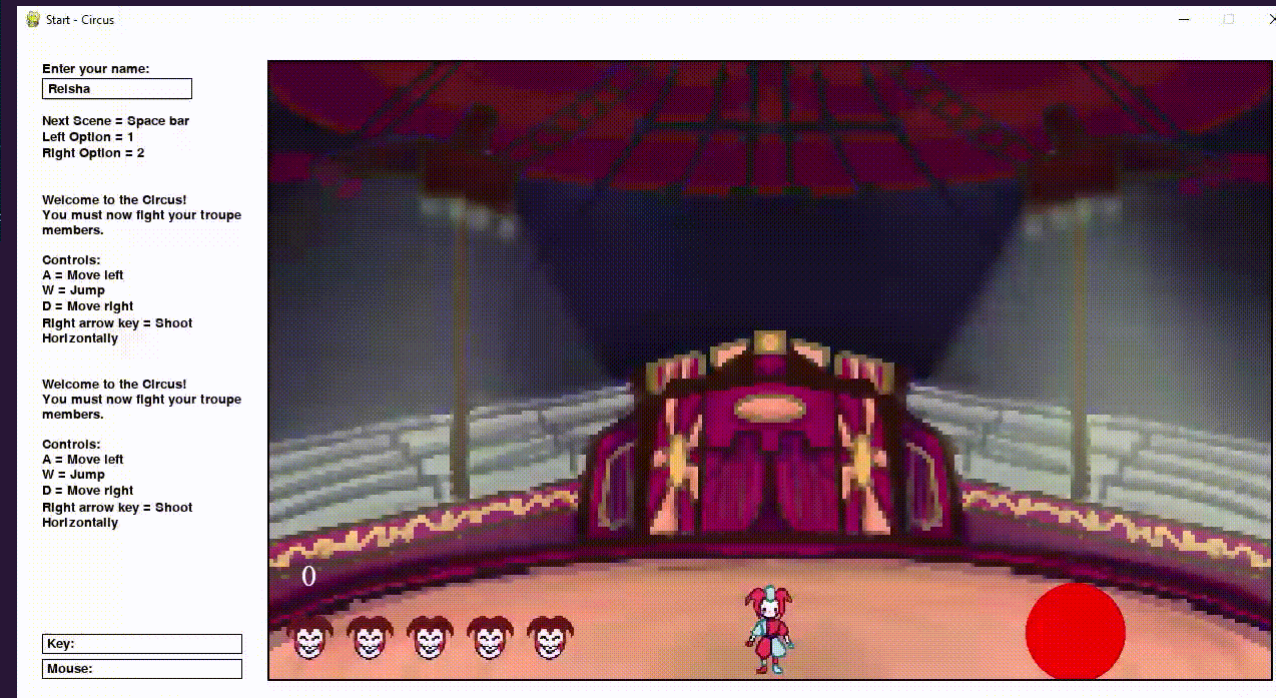


When hit with a tooth, you lose a life.

# Enemy – Ventriloquist



When approaching the ventriloquist, he will back away from you.





# Enemy – Ventriloquist



Phase 2.

Teeth fall from the sky and must be dodged to continue to the next enemy.

# Enemy – Aerialists

- The Aerialists are the second enemy encountered.
- The controls are written on frame of the screen.
- Difficulty:
  - Players lives are not replenished.
- Aerialists are the black circle.
- Phases work on a timed cycle.
  - Phases repeat until the enemy is killed.

# Enemy – Aerialists

- The enemy moves along the top of the screen.
  - A vertical weapon has been added.
  - Can be controlled using the up arrow key.



# Enemy – Aerialists

- First phase:
  - Shoots lyras at the players.
  - Fall in a curve pattern with random velocities.





# Enemy – Aerialists

- Second phase:
  - Throws a series of silks across the screen.





# Enemy – Aerialists

- Third phase:
  - Sends a web that accelerates towards the ground.
  - If hit by a lyra, silk, or web:
    - Player loses a life.



# Enemy – Aerialists



## Defeating the Aerialists...

Results in a victory.



## Dying...

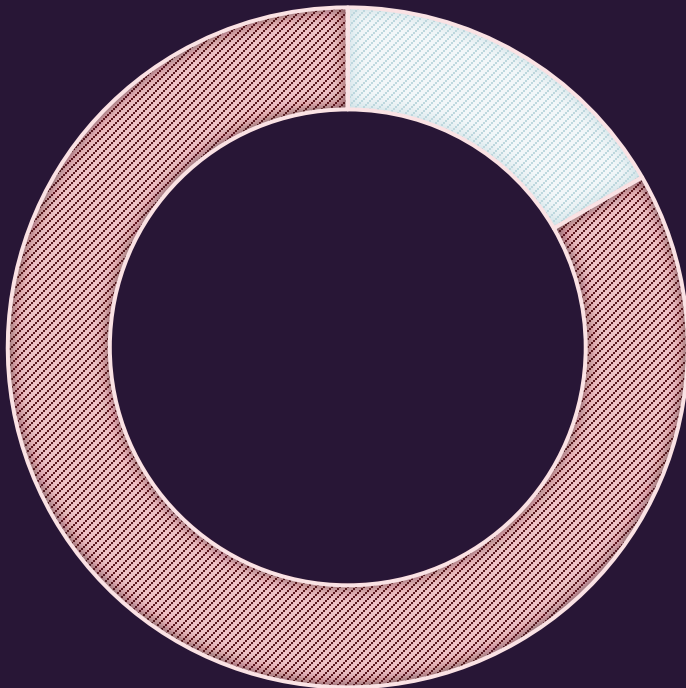
Results in the death screen.  
Can restart the fighting section or quit.

# Questionnaire – General Players Info

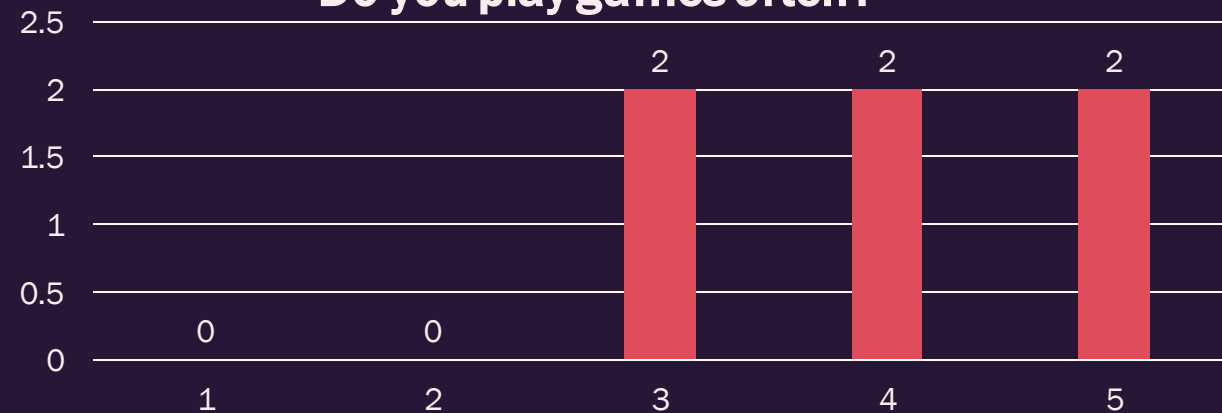
We asked our friends their opinions on the game.

## HOW OLD ARE YOU?

■ 14 or Younger ■ 15 - 18 ■ 19-25 ■ 25-35 ■ 35+



## Do you play games often?

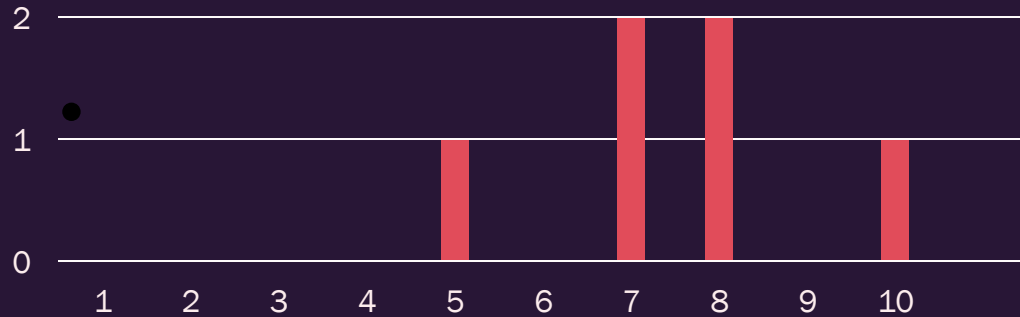


## Typically played games:

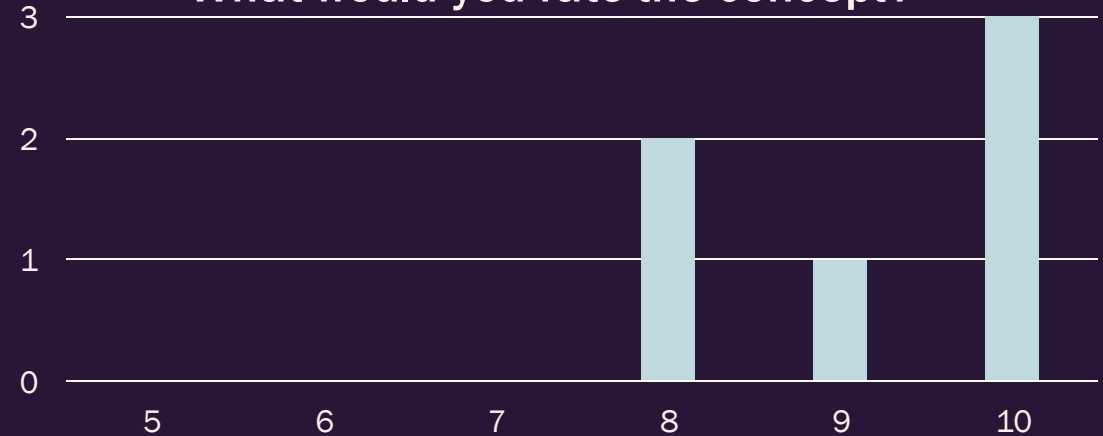
- FPS
- Platformers
- RGP
- Puzzle
- Action
- Casual

# Questionnaire – General Game Info

How would you rate the overall gameplay experience?

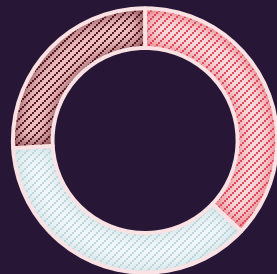


What would you rate the concept?

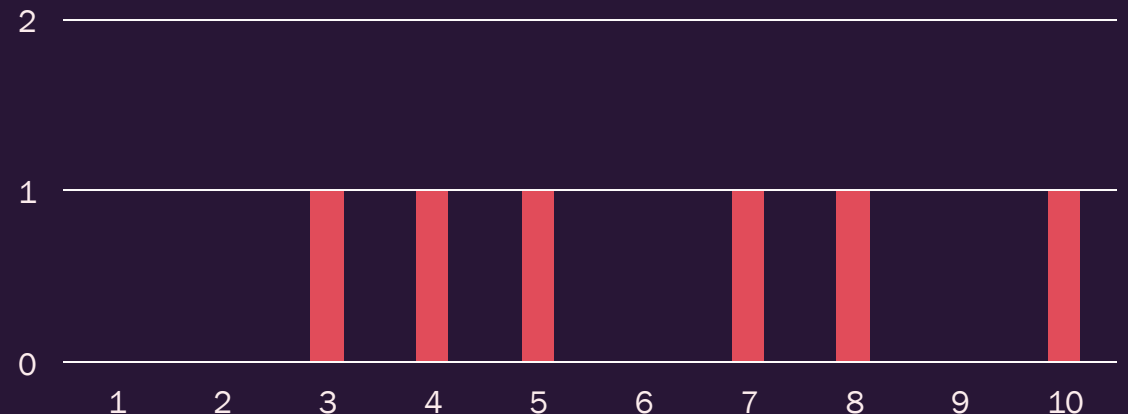


WHAT SECTION DID YOU ENJOY MOST?

Dialogue Ventriloquist Aerialist

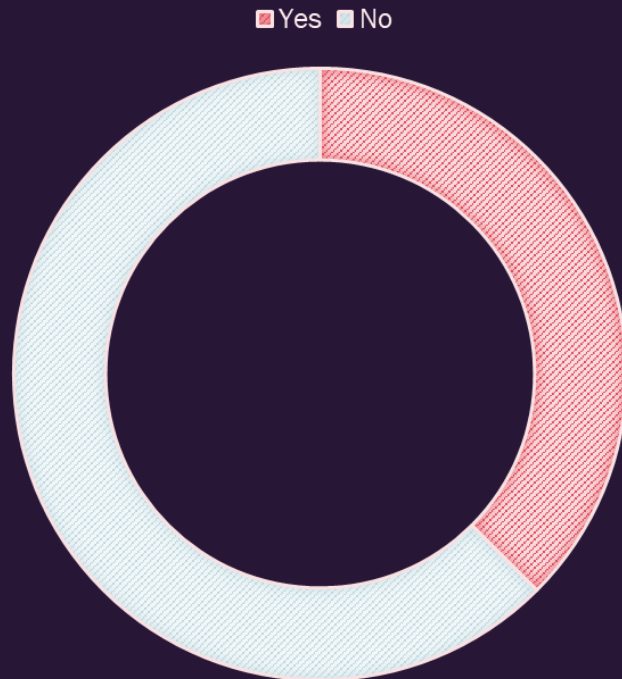


How challenging did you find the game?



# Questionnaire – Ventriloquist

## DID YOU FIND THE VENTRILOQUIST DIFFICULT?



### Why was the Ventriloquist challenging?:

- Yes, random pattern of projectiles very hurtful Platformers
- The hit box for the things they send is too big, so damaged when not touching

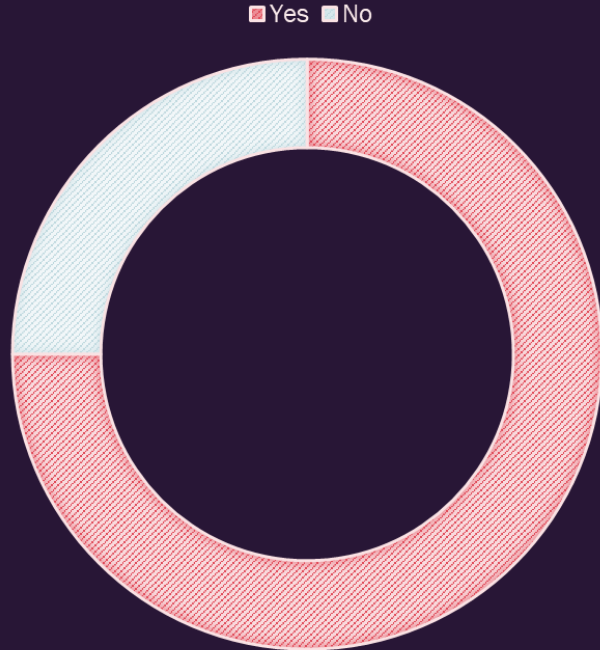
### Why was the Ventriloquist NOT challenging?:

- It's not that it isn't challenging, it's just not as challenging
- You could quite easily hold the right arrow when spawning, killing him immediately
- I just spam shoot and he dies
- I'm a gamer
- it was easy to defeat compared to the other one
- By spamming the attack and standing near the enemy, it was defeated before any attacks could come at me



# Questionnaire – Aerialist

## DID YOU FIND THE AERIALISTS DIFFICULT?



### Why were the Aerialists challenging?:

- Movement is very important if you mess up movement you lose
- Idk I didn't even manage to beat the first boss.
- in the air so hard to align oneself to its trajectory however I like the challenge
- There was a lot more types of attacks and things happening on the screen. It was fun dodging them all.

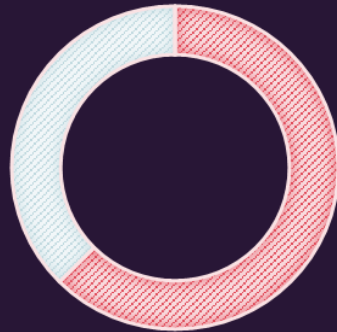
### Why were the Aerialists NOT challenging?:

- Going to the rightmost side of the screen would keep you pretty safe
- I stood in a corner and dodged everything
- Hits from the bottom didn't count

# Questionnaire – Game play experience

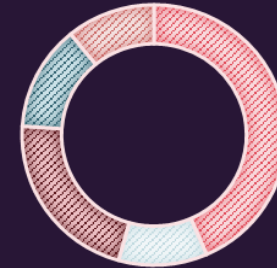
## WOULD YOU PLAY AGAIN?

■ Yes ■ Maybe ■ No

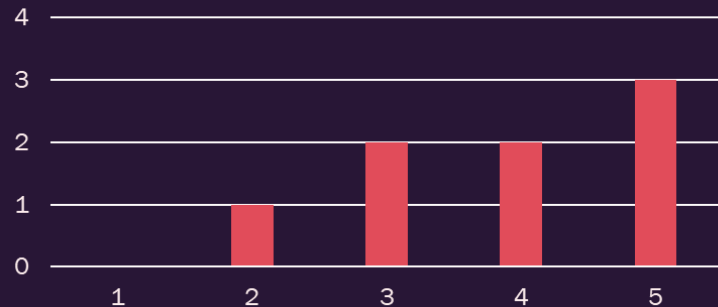


## TIME TAKEN TO COMPLETE THE GAME

■ <15 minutes ■ 15-30 minutes ■ 30-60 minutes ■ 1-2 hours ■ 2+ hours



## How would rate the controls?



## Did you feel the points system balanced?:

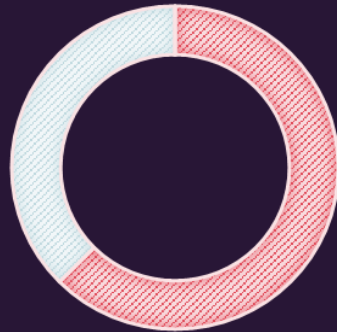
- Majority yes
- Yes, aside from hits from below not counting
- Despite not knowing, points seem fair.



# Questionnaire – Other Features

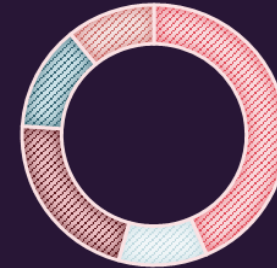
## WOULD YOU PLAY AGAIN?

■ Yes ■ Maybe ■ No

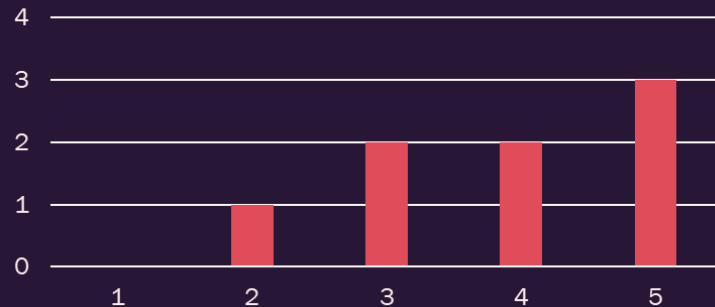


## TIME TAKEN TO COMPLETE THE GAME

■ <15 minutes ■ 15-30 minutes ■ 30-60 minutes ■ 1-2 hours ■ 2+ hours



## How would rate the controls?



## Did you feel the points system balanced?:

- Majority yes
- Yes, aside from hits from below not counting
- Despite not knowing, points seem fair.

# Questionnaire – Feedback

Did you encounter any technical issues?:

- Some Nos
- Project not appearing
- Skipping during the dialogue
- Codeskulptor Issues
- Vertical shooting not working
- Players getting timed out

Did the game meet your expectations?:

- Didn't know what to expect
- Many yes'
- Exceeded Expectations

What improvements would you suggest?:

- A credit system where you can character (like level ups)
- Improved graphics for dialogue section so the game is more immersive
- Make the bosses easier, don't have to make sans
- A break in the dialogue with more choices to engage the player more
- For it to be completed :D
- Make the 2<sup>nd</sup> enemy part a bit easier
- Have a delay before the enemies start attacking at the beginning so there's time to read the instructions of moving and fight

# Self Reflection – Rewriting code

- Some sections need to be rewritten.
- Difficulty with revisions of code due to timing.
  - Portions of code are inefficient or out of order.
- Code could be broken down further.
  - Increasing readability and understanding.

# Self Reflection – Different Language/IDE

- Utilising a different language or IDE may help with:
  - Error detection.
  - Encapsulation.
  - Better documentation.
  - Etc...

# Self Reflection – Different Language/IDE

Here is an example of code written in Python vs Java:

```
def update(self):
    if (len(self.dialogueOptions.dialogueList) < self.currentDialogue): #checking wh
        self.finished = True #stopping the dialogue scene
    else:
        if (self.finished == False): #checking if we have made it to the end of the
            if self.delayBool == False: #adding a delay to the next button
                self.delayBool = True #restarting the delay
            if ((self.keyboard.next == True) or (self.keyboard.option1 == True)
                if self.currentDialogue == 18: #option menu
                    if(self.keyboard.option1 == True): #option for yes
                        self.currentDialogue = 23 #jumping to the continuation fo
                    elif(self.keyboard.option2 == True): #option for no
                        self.currentDialogue += 1
                        self.delay.start()
                    elif self.currentDialogue == 22: #reaching the end of option 1
                        self.currentDialogue = 34 #jumping to the continuation of t
                        self.delay.start()
                    elif self.currentDialogue == 38: #switching the scene of the cha
                        self.place = "BackStage"
                        self.currentDialogue += 1
                        self.delay.start()
            else:
                if(self.keyboard.next == True): # checking if the next button is
                    self.currentDialogue += 1 #moving onto the next scene
                    self.delay.start()
```

```
public void update(){
    if((dialogueOptions.getDialogueList()) < (currentDialogue.length())){
        finished = true;
    }else{
        if(!finished){
            if(!delayBool){
                delayBool = True;
            }
            if((keyboard.next || keyboard.option1 || keyboard.option2) && (currentDialogue == 18 || currentDia
                switch(currentDialogue){
                    case 18:
                        if(keyboard.option1){
                            currentDialogue = 23;
                        }else if(keyboard.option2){
                            currentDialogue ++;
                        }
                        break;
                    case 22:
                        currentDialogue = 23;
                        break;
                    case 38:
                        place = "BackStage";
                        currentDialogue ++;
                        break;
                }
                startDelay();
            }else{
                if(keyboard.next){
                    currentDialogue ++;
                    startDelay();
                }
            }
        }
    }
}
```

# Future Versions – Errors from feedback

- Few bugs were missed.
- Some were highlighted through feedback.
- Errors were:
  - The vertical weapon not affecting the Aerialists.
  - The game timing out and kicking players out abruptly.
  - An exploit in the corner of the screen.
  - Weapon exploit.
  - Balancing issues (the difficulty of the enemies – certain features are overpowered).

# Future Versions – Features removed due to time

- Some features were abandoned.
  - Due to time.
  - Features:
    - Mini-games between dialogue/enemies.
    - More dialogue/enemies.
    - More player attacks.
      - Mallet.
      - More projectiles.
    - Finished visual elements.
  - We wish to implement these features in future versions of the game.

# Future Versions – Features removed due to time

Here are some of the concept designs for some of the other characters





# Future Versions – New Ideas

- Additional features we have thought of (based on feedback and research):
  - Save screen.
  - Interactive tutorial section.
  - Adding music/sound effects.
  - Adding more animations.

**Thank you**