Python grade 10 final project

Planning

!!The title screen will be displayed after the story display!!!!!!

December 10th

1. Game planning (December 10 to December 20, the story is constantly being edited)
    - Name: “Achtung! Feuer!” (Attention! Fire!)
    - When the game starts, it will automatically play the game setting(press A to continue…):
        - A day, a person accidentally enters the world of imaginary stories. He decides to call himself “V”.
        - V adventure through different stories and gradually becomes stronger than anyone he knows.
        - He becomes bored of current life and want to go back to the reality, however, he cannot go back.
        - Decades passed, V is tired of being the “good guy” and starts to massacre through universes. V will soon approach the Undertale universe.
        - Sans from the undertale universe who can travel through time and space notices the massacre. He asks Tanya from the closest universe to help.
        - When V starts massacring residents in a universe, Sans and Tanya arrives. One of them has to evacuate the residents into the nearby universe and the other one has to battle V and stops V from killing the others.
        - Now, You can choose from Sans and Tanya to fight. The other one will be evacuating the residents. Good luck!
        - This game will allow players to pick from the two characters to fight the boss.
            - The characters available characters are:
                - Sans(From Undertale)
                - Tanya(From Saga of Tanya the evil)
    - Then it will introduce the use of “wasd” keys and attacks:
        - W up
        - A left
        - S down
        - D right
        - The boss has a total of 1800 hp

    - Every time you hit the bullet you lose 1 hp
    - Both characters have 3 hp
    - There is no difference between the two characters except for their appearance.
    - (This will not be displayed on the screen: When the space key is pressed, because the time that pygame run through a loop is inconsistent, the bullets will also be inconsistent(which is very random) However, after some testing, I set the boss health to be 1800.)
    - Then it enters to the game start screen, user has three choices:
        - Start game
        - Display the rules again
        - exit
- If the player deals 3000 or more damage before the 80 second fight time, the boss will say: “If you promise that you will take me back into reality I will not destroy the universe.” [Good End]
    - V: Ahhhh…
    - V: I see.
    - V: You have enough power to send me back to where I belong.
    - V: If you can send me back, then no one else need to die.
    - V: So, why not? As you can see I won’t die even after I lost all my hp.
    - Sans: Heh. Sure.
    - Tanya: Sans! NONONONONONO! You are not sending this criminal away! NONONONONONO! He has to pay the price!
    - Sans: Come on Tanya, we both know this guy is protected by this universe. He is a real human. Not like us. Our lives can be easily changed by people like him from the other universe.
    - Tanya: (scoffs)Then do it, I still got battles.
    - Sans: Thank “You” for letting us win.
    - Tanya: (scoffs) We all know if this program resets we are coming back.
    - Sans: Nah, I won’t remember anyways, so it doesn't matter.
    - Sans: Later!
- If the player did not die before the 80 second but did not reach 3000 damage the boss will think that the player is not strong enough to take them back to reality, boss V escapes. [Regular End]
    - V: You are very persistent, aren’t you? Despite the fact that you don’t have enough strength to kill me, you did not die.
    - V: To be honest with you, I want to kill you. But I guess staying longer doesn’t help me.
    - V: HAHAHAHAHAHAHAHAHAHAHA!!!!!!!!!!
    - (V escapes)

        - Sans: Thank you for letting us win.
        - Tanya: (scoffs) We all know if this program resets we are coming back.
        - Sans: Nah, I won't remember anyways, so it doesn't matter.
        - Sans: See you later!
    - If the player loses all the hearts during the battle, The following dialogue will appear. [Bad End]
        - (After losing the battle, V is unstoppable.)
        - (He killed everyone in the universe, Sans and Tanya lie on the floor, dying)
        - Sans: Welp, I guess we have another chance, don't we?
        - Tanya: Training! Training! Can you not use a keyboard? You have to sacrifice! Sacrifice your fingers!
        - Sans: Oh, calm down Tanya, you know we are just a part of this computer program, we could start over again.
        - Tanya: (scoffs)
        - Sans: come on, Tanya. (secretly blinks to you) Later!

Dec 11:

Choose the background music

- ✓ Los! Los! Los! (German cover) for the start screen
- ✓ Undertale soundtrack 41: Chill for the story display
- ✓ Undertale soundtrack 100: Megalovania for the battle bgm
- ✓ Undertale soundtrack 33: Quiet Water for the ending display

The game will be 2 minutes long, then the battle music ends, the player can see the endings.

Making sprites and stories

Dec 12:

Today I focus on making sprites of characters and their weapons

- ✓ Sans's sprite
- ✓ Tanya's sprite
- ✓ Sans's special attack and weapon(deleted later)
- ✓ Tanta's special attack and weapon(deleted later)
- ✓ The screen that shows "chose Sans" and "chose Tanya"
- ✓ The Icon of the game

Dec 13:

Today I focus on writing the story line, the endings, the title screen

- ✓ The story is written
- ✓ Three endings are done
- ✓ The title screen and the three buttons(start, how to play(the rules), and exit)

Dec 14:

Some of the sprites still have some background on it so I have to clean it.

- ✓ I coded the part that can make the characters move, and I also draw a hitbox
- ✓ The hitbox is restricted in the play screen. Since the character's coordinates are related to the hitboxes coordinate, the character will move with the hitbox.
- ✓ In the end, the hitbox cannot go outside of the playscreen, but the character can go a little offscreen because the character is larger than the hitbox, like this:

The green box is the hit box. The collision detection will be for the hitbox, not the character. The hit box is changed to red later because I changed some of the sprites.

Rough Coding

Dec 15:

- ✓ I have make the pictures that displays the story
- ✓ Problem to solve: The code is right and python does not give warnings or errors, but the program does not respond whenever I put timers.(like tick(), delay(), or wait())

Here are some old code:

```
screen.blit(storypage1,(0,0))
pygame.display.update()
delay(2000)
screen.blit(storypage2,(0,0))
pygame.display.update()
delay(2000)
screen.blit(storypage3,(0,0))
```

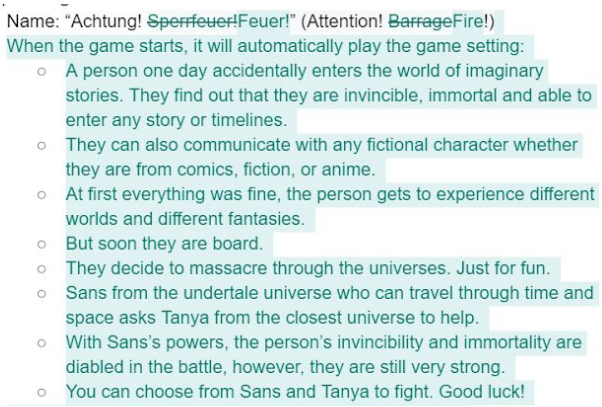
```
pygame.display.update()
delay(2000)
screen.blit(storypage4,(0,0))
pygame.display.update()
delay(2000)
```

- ✓ Problem to solve: The game screen needs to be “shaked” around with a mouse in order to display the image. Solved: need to update the display and convert the image when loading it.

Dec 16:

Today I actually changed the idea and rewrite the story. Before it only has two endings now it has three. I go back and decides to name the boss “V”.

A picture of the old version of the story:

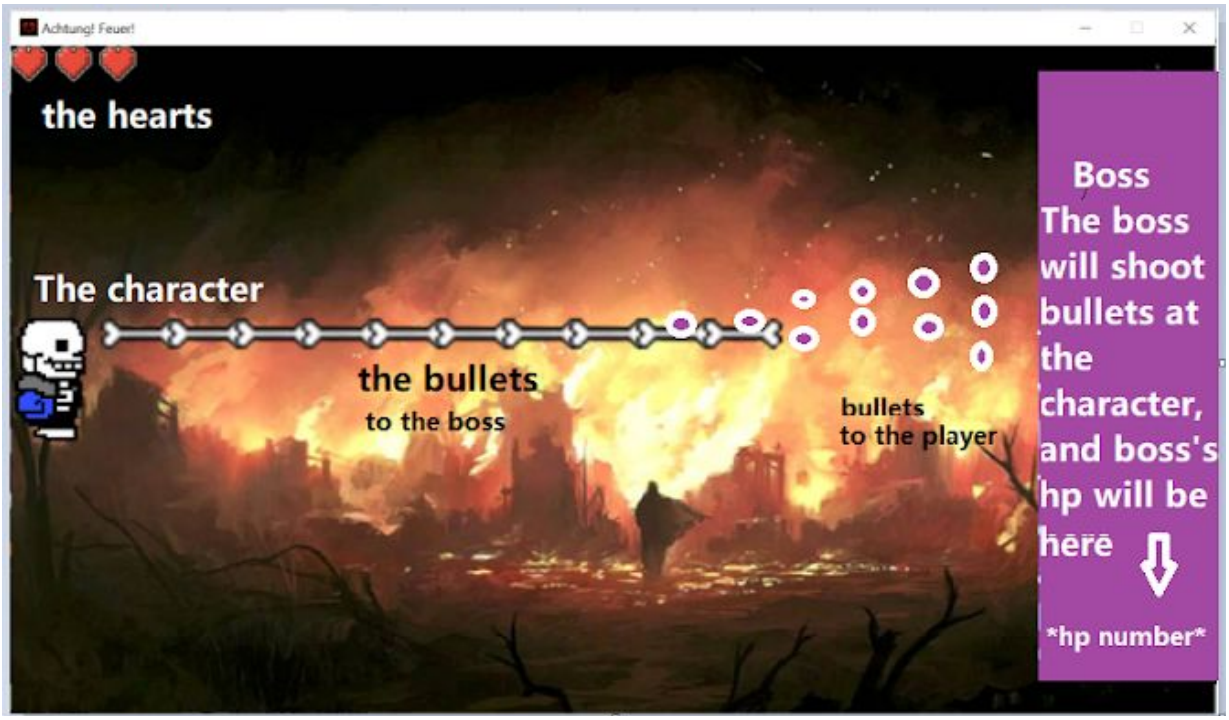


Name: “Achtung! ~~Sperrfeuer!~~Feuer!” (Attention! ~~Barrage~~Fire!)
When the game starts, it will automatically play the game setting:

- A person one day accidentally enters the world of imaginary stories. They find out that they are invincible, immortal and able to enter any story or timelines.
- They can also communicate with any fictional character whether they are from comics, fiction, or anime.
- At first everything was fine, the person gets to experience different worlds and different fantasies.
- But soon they are board.
- They decide to massacre through the universes. Just for fun.
- Sans from the undertale universe who can travel through time and space asks Tanya from the closest universe to help.
- With Sans’s powers, the person’s invincibility and immortality are diabled in the battle, however, they are still very strong.
- You can choose from Sans and Tanya to fight. Good luck!

Also, I planned to change the pictures to make the game looks better:

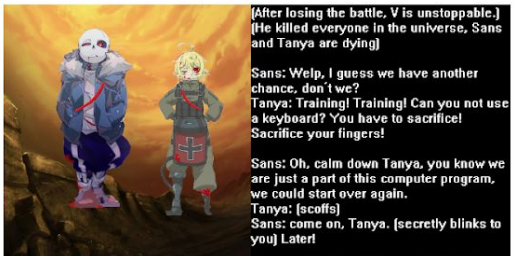
Old version

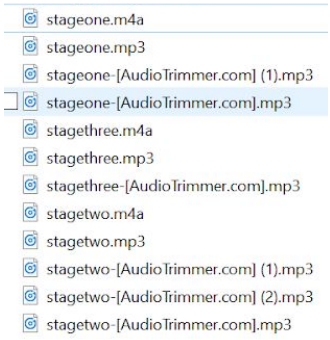


New version:

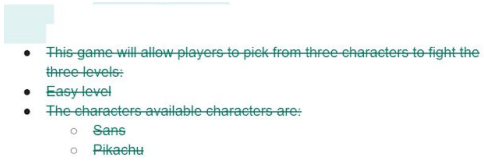
Dec 17:

The three ending page is now done. When the player triggers certain ending page it will display at the end of the game.





The audio files that I decide not to keep. Since I originally planned that there will be stages, I cut these audios, but in the end I find out that I do not want to do stages anymore.


- ~~This game will allow players to pick from three characters to fight the three levels:~~
- ~~Easy level~~
- ~~The characters available characters are:~~
  - ~~Sans~~
  - ~~Pikachu~~

(The original idea)

Dec 18:

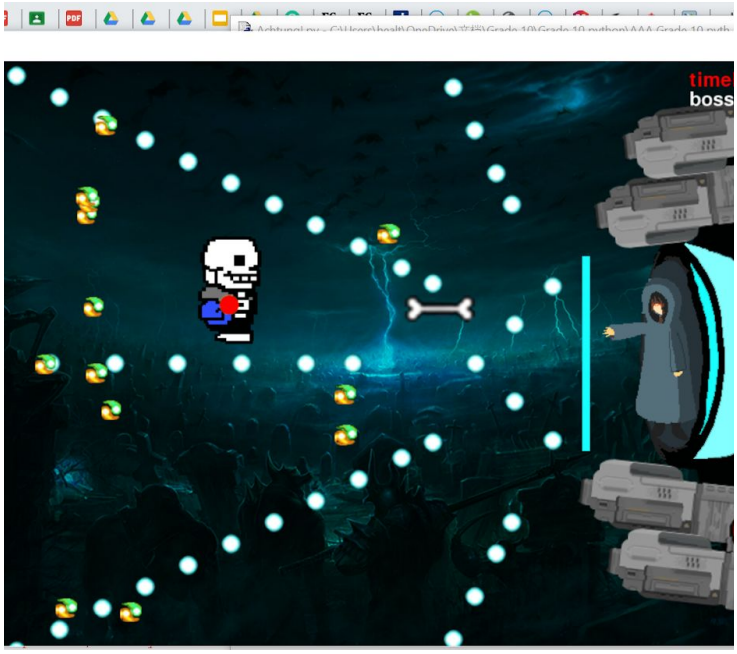
The scoring page is done. 

(Though it is deleted later because it is unnecessary and I do not want it anymore)

----------Winterbreak----------

I planned out 3 bullet patterns.

One is the “randomflys”, where the bullets are shot from the back and then randomly travels to the boss and obstructs the character. (The orange and green yin-yang circles is the bullet) The blue ones belong to another bullet pattern.



Second one is the “line of bullets with random space”. This bullet pattern is made up of a line of 12 bullets that travels the same direction and same speed. However, there is a hole in the walls that can make the player to pass through. The hole in the line is randomized. I first randomize a number from 0-11. I use a for loop to add in the bullets,

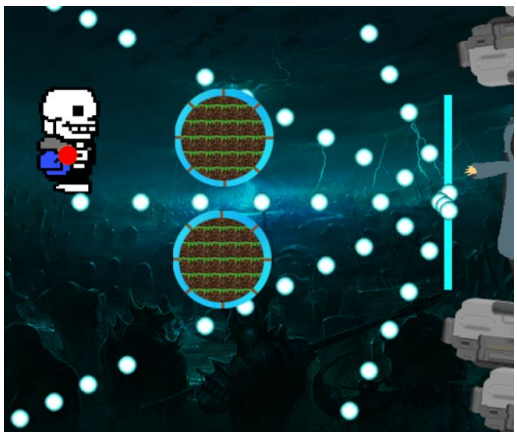
```
def randomnuminlist(randomnumber):
    posofbullets = []
    for i in range(12):
        if i == randomnumber:
            pass
        else:
            posofbullets.append([1030,i*50])
    return posofbullets
```

 (There is a randomized space)

This function takes the random number from 0-11. The for loop will not add a bullet if the “i” of the loop is the random number. It returns a list with 11 numbers of i*50. Then another function

will take this list and go through it and blit the bullets. Because one number is skipped, the corresponding spot will not have a bullet, so there will be a hole in the wall.
The tact for the player is to speed up so that the wall will not hit them.

The third bullet pattern is one big bullet that is shot from the boss direction to the character:
(Originally it is a square but since it does not look very impressive I changed it to a circle.)



```
def onebigbullet(xvalue,randomnum,hitboxcol,speed):
    ifhit = [False,False]
    xvalue[0] -= speed
    oneblockcol = pygame.Rect(oneblock.get_rect())
    oneblockcol.x = xvalue[0]
    oneblockcol.y = randomnum
```

(How it looks like in the game and rough code)

Back to School

Advanced coding

Jan 6 and Jan7 (collision detection spent me two days):
I decided to learn how to code collision detection so I learn from the tutorials and ask my parents to teach me, in the end I figure out how to check if two character collides.
Like this:

```
    hitboxcol = pygame.Rect(hitbox.get_rect())
    hitboxcol.x = x
    hitboxcol.y = y
    testobject = pygame.Rect(tanya.get_rect())
    testobject.x = 400
    testobject.y = 200
If hitboxcol.colliderect(testobject):
#this makes the third live disappears
        Live3 = False
```

```
bosshealth = 1800
#The invincibility protector
invincible1 = 300
shield1 = True
invincible2 = 300
shield2 = True
#Speed of character
velocityofcharacter = 2
#The three lives
live1 = True
live2 = True
live3 = True
```

Find a problem:
The heart all disappear at once because the loop repeats so fast then it sets all of the lives "False" in less than a blink.

solve:
the shield and invincibility variable.
invincibility variable starts with 300, after a life turns false, it starts to subtract 1 every loop. When it reaches 0, it means protection time is over.
The shield is a boolean, breaks(turns False) when the invincibility is smaller than 0

Find problem:
In a bullet pattern function, I need to know if the bullets hit the character and if the bullets are out of the screen, however, a function can only return one value.

solution:
define ifhit. ifhit is a list of two booleans that appear in most of the bullet patterns. The first item in the list determines if it hits the character, the second item in the list determines if the bullets reach the end of the play screen. If it is, we start to pop the list and clear the list.

```
def onebigbullet(xvalue,randomnum,hitboxcol,speed):
    ifhit = [False,False]
    xvalue[0] -= speed
    oneblockcol = pygame.Rect(oneblock.get_rect())
    oneblockcol.x = xvalue[0]
    oneblockcol.y = randomnum
    screen.blit(oneblock,(xvalue[0],randomnum))
    if oneblockcol.colliderect(hitboxcol):
        ifhit[0] = True
    if xvalue[0] <= 0:
        ifhit[1] = True
    return ifhit
onerandom = randomshoot()
tworandom = randomshoot()
```

(added in the collision detection)

problem:
the programs sometimes run very fast and sometimes very slow.
solve:
close most of the running programs to make space in the CPU...

Jan.8:

I changed my idea of having a special attack for the character because it is not necessary. The sprites I originally prepared for the special attack has become one of the boss's attacks.

- M special attack that can dealt 20 damage(20 seconds cooldown time for both characters)
- Press space to shoot, every second you can shoot 6 bullets
- The boss has a total of 1000 hp
- Every time you hit the bullet you lose 1 hp
- Both characters have 3 hp

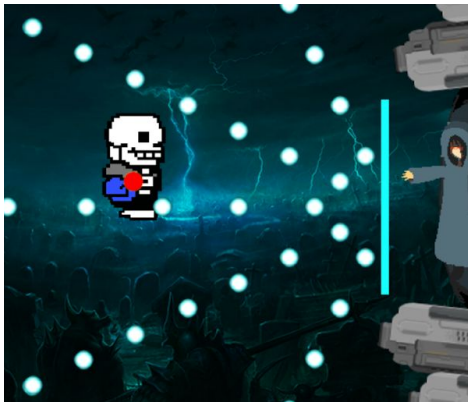
I also changed the boss's hp

Jan9:

The rules screen is drawn. From now on the rules will not be changed again.
I can display images now and hold it for a while. I tried to use get.ticks(), delay(). And wait(). They do work but they cannot hold longer than 4 seconds. If the number of milliseconds is bigger than 3999 it is not going to respond and display the next image. If hold longer than 3999 milliseconds, it will not respond then jump straight to the "choose character".

Jan 10:

problem:
the game is not hard enough
solve:
add bullet patterns. I decided to write a new bullet pattern with the boss shooting 5 lines of bullets. This is an extra obstacle to the character.



Jan 13:

I decide to add a laser shooting. The game will warn the player for 1.5 seconds, then will shoot the player for 1.5 seconds.

(warning) (laser)

(laser)

Jan 14:

I originally defined a function, but then I found the timing of the laser shooting is very hard to control in a function, so I deleted the function entirely.

```
usedblaster = True
def gasterblaster(gametime):
    if pygame.time.get_ticks()%3 == 0:
    screen.blit(blasterlaser,(0,lasty-50))
    screen.blit(vertlaser,(lastx-30,0))
```

Jan 16:

This time I decide to time the laser shooting in the while loop instead of making a function.

```
        if gametime >= 46500 and gametime <= 48000:
            blastereffect.play()
            if pygame.time.get_ticks()%3 == 0:
                screen.blit(blasterlaser,(0,lasty-50))
                screen.blit(vertlaser,(lastx-30,0))
```

```
vertlasercol = pygame.Rect(vertlaser.get_rect())
vertlasercol.x = lastx - 30
vertlasercol.y = 0
blasterlasercol = pygame.Rect(blasterlaser.get_rect())
blasterlasercol.x = 0
blasterlasercol.y = lasty - 50
if blasterlasercol.colliderect(hitboxcol) or vertlasercol.colliderect(hitboxcol):
    if invincible1 == 300 and invincible2 == 300:
        live3 = False
        shield1 = False
    elif invincible1 <= 0 and invincible2 == 300:
        live2 = False
        shield2 = False
    elif invincible1 <= 0 and invincible2 <= 0:
        live1 = False
```

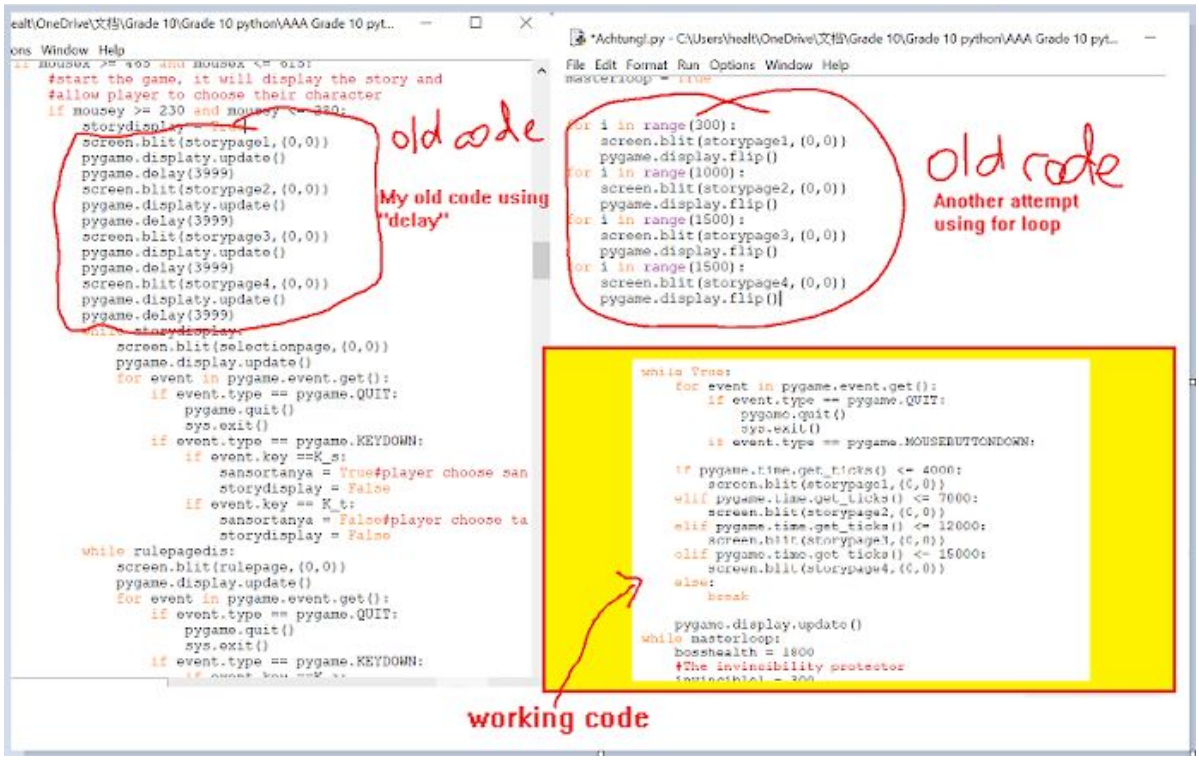
Refining

Jan 17 + Last weekend:

I refining the code and add in comments in the code. I also add proper spacing and split the program into sections.

Problem solved:

I remember my story display problem, so I decided to move it out of the while loop before the main screen to make it feel like a real game.



On the left is the code inside the loop. But the delay pauses the entire program, so I decide to move it out of the main loop.

On the top right is where I try to blit image with for loop. But when the player click their mouse during the display, it suddenly become not responsive.

I figure out that there are two things I need to fix:

No delay(), no clicking. So I add on the image to notify the player to not click the mouse button, and I also had a event.type == mousedown, everytime the player press the mouse it just passes. I also put those code in a while loop and add the timer so that the image will be automatically displayed. After the story display is the title screen!!!!!!

Lastly, I looped the whole code so that the player can play the game again.

```
while masterloop:
    bosshealth = 1800
    #The invincibility protector
    invincible1 = 300
    shield1 = True
    invincible2 = 300
    shield2 = True
    #Speed of character
    velocityofcharacter = 2
    #The three lives
    live1 = True
    live2 = True
    live3 = True
    #if the space key is pressed the stat is true
    shootbullets = False
    #lits of bullets
    bulletlist = []
    #shots, hit and missed
    shots = 0
    hit = 0
    #if you loses all your health
    youdead = False
    died = 0
    badendingloop = False
    normalendingloop = False
```

The masterloop