Description and Readme

psxjm12 Jiacheng Mai 20298925

pscyz17 Yang Zhao 20298803

psxyw6 Yihan Wang 20251970

Introduction

This is a game where airplane could attack the enemy by firing bullets and get score.

Readme

To start the pygame, open the file ‘Aircraft\_war’ and press ‘Start’ or ‘F5’.

Characters

1. Rocket

It is controlled by player through pressing keys:

w: go up and turn to face the top

s: go down and turn to face the bottom

a: go left

d: go right

space: fire bullets

i: increase incident

q: quit

1. Aliens

Based on the width of the screen, two rows of 9 aliens will appear separately on the top and bottom of the screen at the same time.

These aliens gradually move closer to the center line of the screen and fire bullets randomly.

How to play:

There would be two buttons on the initial interface of the game: Start and Help.

Player could check that how to play by pressing the Help button or start the game by pressing Start button.

Player have 3 lives on the beginning. And player need to attack the enemies by moving and pressing space bar.

Once player hit one enemy,the score would plus 50 and be showed on the screen.

When player hit by an enemy bullet or encounters an enemy, or the enemy reaches the center of the screen, one life will be lost.

The game over until player lose all the lives in game.

Explanation of some basic functions in every python file:

1. setting.py:

This is a class storing all the settings of the game(e.g.the size of screen, the speed of bullets).

1. rocket.py:

Some basic functions:

2.1: \_\_init\_\_:initialize the position of rocket;

2.2: update\_rocket:change the position of rocket as it moves;

2.3: blit: draw the rocket at certain position.

1. alien.py:

This is a class initializing aliens, updating aliens’ positions and checking whether the position of aliens exceeds both sides of the screen;

1. bullet.py:

This is a class initializing and updating bullets of rocket by detecting which direction the rocket is facing;

1. alien\_bullet.py:

This is a class initializing and updating bullets of aliens. All the bullets cannot be beyond the height/2 line.

1. button.py:

This is a class initializing and drawing buttons.

1. textbox.py:

This is a class setting the basic information of Help button.

1. states.py:

This is a class initializing the score and lives.

1. incidents.py

This is a class initializing and updating the incidents.

Including one life up and clear the setting.

1. scoreboard.py

Some basic fuctions:

10.1: prep\_score:

set the area of showing score;

10.2: prep\_highest\_score:

rest the score;

10.3: prep\_rockets:

show how many lives left;

10.4: \_\_init\_\_:

initialize the scoreboard by calling 12.1, 12.2, 12.3.

1. functions.py:

Some basic fuctions:

11.1: respond\_keydown\_events, respond\_keyup\_events:

handle key events when player press or release one key,respectively;

11.2: check\_play\_button, check\_help\_button:

react when player click one of the buttons;

11.3: respond\_events:

handle events by calling 11.1, 11.2;

11.4: screen\_update:

update every element on the screen;

11.5: update\_bullets:

remove bullets when they beyond the top and the bottom of the screen;

11.6: check\_bullet\_alien\_collisions, check\_alien\_bullet\_rocket\_collisions:

Separately detect collisions of the player's and enemy's bullets with each other;

11.7: fire\_bullet, fire\_alien\_bullet:

these two functions could be used to control when the spacecraft and aliens fire bullets;

11.8: get\_number\_aliens\_x, create\_alien, create\_aliens:

create two rows of 9 enemies

11.9: change\_aliens\_direction, update\_aliens:

enemies would turn to the opposite direction when they touch the left or the right side of the screen;

11.10: rocket\_hit:

count the lives that the player has. Every time rocket touches any enemy, player would lose one life;

11.11: check\_highest\_score:

reset the player's score;

1. Aircraft.py:

This is the main python file of the game.

Run this file to start the game page.

References

Reference url: <https://www.ituring.com.cn/book/1861>

Based on the original structure of the alien\_invasion pygame, we construct the fundamental structure of aircraft\_war. Besides the original functions, we also add several new functions, so that the game can be more interesting.

Below are several alterations.

First alteration, not only do we let the rocket to go left or right, but also it can go up and down.

Second alteration, not only can the rocket fire the bullet, aliens can also fire the bullets randomly. When the rocket hit alien bullets, the life of the rocket decrease by one.

Third alteration, instead of all the aliens are from the top of the screen, the enemies are from the top and also the bottom of the screen. In addition, the rocket can fire the bullet heading down, so that the enemies from the bottom can also be eliminated.

Fourth alteration, we can add the random incidents by pressing ‘i’, including two functions: 1 life up and clear the screen. When the rocket hits 1 life up, the life of the rocket adds one. When the rocket hits clear the screen and add the corresponding points to the scoreboard. Besides, the incident wanders in an uncertain way.

Fifth alteration, we add ‘help button’. If pressed, the instructions of how to operate the game is shown.