Development Project

group member：

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Task assignment:

Zhou Yi achieve the graphic interface using SDL and define the class and initialize variables.
Hao Yuwei achieve multiple functions in the main function using C language and insert background music in the game.

Technical document (academic document for teacher)

Pay attention to: the ".exe" file runs on 32 bits system.

1. **About animation handling**: We realize graphical interface by using SDL. With SDL extensions lib——"SDL_image.lib " , we can load pictures with different formats, such as ".jpg"".png". It makes the game more vibrant   to attract the player. And we make the frames beautiful via bright-coloured color contrast.
2. **About collision detection**: Using collision detection, we can know when the player's helicopter rush into enemy's tank , plane, UFO ,enemy's bullet or building, the game over. And when our bullet hit enemy's tank, plane, UFO or building. The enemy will disappear.

```
//check the collsion o bullet and ufo
yourUfo.xm=yourUfo.x+UFO_WIDTH/2;
yourUfo.ym=yourUfo.y+UFO_HEIGHT/2;
//printf("myBullet.xm=%d,myBullet.ym=%d,yourUfo.xm=%d,yourUfo.ym=%d\n",myBullet.xm,myBullet.ym,yourUfo.xm,yourUfo.ym);
if(abs(myBullet.xm-yourUfo.xm)<(BULLET_WIDTH+UFO_WIDTH)/2&&abs(myBullet.ym-yourUfo.ym)<(BULLET_HEIGHT+UFO_HEIGHT)/2&&bulletalive==0)
{disappearufo=0;
bulletalive=1;}
```

For example, this is the code about collision detection.
If the distance of the two objects' central point less than half of the sum of the two object's width or length, it will be judged as collision.

3. **About fireball movement**:   To realize movement, we use three ways.
The first, we pressing "key presses" to control the object moving, such as the player's helicopter.
The second, we set a constant path, and the object will go follow the path, such as the enemy's plane.
The third, we use judgement sentences, and the object can follow something, such as the enemy's UFO, the UFO can follow the player's helicopter.
4. We use true type fonts to display "GAME OVER" or "YOU WIN", which marks the game end.
5. We use "class" to realize packaging the object and operation together.
6. We use C language to realize the function of our game.

7. Setting up the environment is very important. I use VC++6.0 environment and Hao Yuwei use codeblock environment.

8. When we edit the game, we usually use "printf" to output the object's coordinate to test our fault.

9. Initialize is very important, otherwise the code won't run.

10. We insert background music 《hummell gets the rockets》using SDL. So, player can hear the music when they play the game all the time.

11. For this code, we use it to realize when the player's bullet hit enemy's tank, enemy's tank disappear once. But we don't know why now the tank can't disappear when the player's bullet hit enemy's tank.

```
if(abs(myBullet.xm-yourTank.xm)<(BULLET_WIDTH+TANK_WIDTH)/2&&(myBullet.ym-yourUfo.ym)<(BULLET_HEIGHT+TANK_HEIGHT)/2)
{disappeartank=0;}
```

12．To be honest, when the helicopter go to somewhere its bullet can't be thrown out and we don't know why. Meanwhile, move the helicopter in random then back to the same place, the helicopter can throw bullet out and we also don't know why.

We list the function we have realized as follow:
Graphics
1.Game aesthetics

  We use a beautiful background with blue sky and white cloud, there are many flowers on the ground.

2.Sprite animations

   The picture of objects are very cute, such as helicopter, enemy's plane, player's home, enemy's home.

3. Ammo animations

   The picture of ammo, such as helicopter's bullet, enemy's bomb are very lovely too.

The copter

1.The copter can move in four directions (forward,backward,up and down)

2.The copter can throw the bullet in all directions(up, down, right and left)

3.The copter can take off and land: the copter can fly in the sky and rest on the land

4.The copter can pick up hostages: when the enemy's building is destroyed by the bullet, and the player's helicopter lands near the capture ,the hostages will be picked up.

5. The copter crashes when hit by opponents/fire: when the player's helicopter is hit by fire, the helicopter will die, so the player will lose the game.

6.The copter can destroy barracks: the copter throw bullet ,when the barracks hit by the bullet, the copter is destroyed.

Opponents
1.There are three levels of opponents (tanks, planes, flying saucers)

2.Opponent track and try to kill the player.(The flying saucer flying follow the helicopter and try to destroy it when they have a collsion.)

3.Opponents are destroyed by the player's fire(we have explain this before)

4. Opponents fire can destroy barracks,Hostages

When the enemy's bomb throw into the player's home, the home will be destroyed.

When the helicopter picking up captures and this time, opponents' fire hit the helicopter, the capture will die.

5.Hostages run out of destroyed barracks.

When the enemy's home is destroyed, the captures will display.

6. Hostages wave at the flying helicopter: You can see the two hands above the capture.

7. Hostages run out of the copter at the base: When the helicopter land in the player's home, the hostages will run out of the helicopter and then, the player win the game.

8.The screen scrolls as the helicopter moves in the stage: When the helicopter fly, the background will scrolls following the helicopter.

9.The player wins when no more (alive) hostages are left out.

Game menu(for player)

When you press "up"" down" "right" "left", our helicopter will move towards corresponding direction, so you can control the helicopter. When you press "i", "j", "k", "l", your helicopter will throw bomb in four directions.

When the bomb rushes into enemy's tank , plane, UFO or their home, they will explode together. When you destory enemy's home, then you can rescue captures. After that, you fly to our home. And you win the game.

When our helicopter rushes into enemy's tank, plane, UFO or their home, they will explode together. But you lose the game. The enemy's plane can fly in the sky. And enemy's UFO will follow you and rushes into your helicopter, you will lose the game.

The enemy's plane and tank also can throw the bullet, if you are hit by enemy's bullet, you lose the game.

If you don't kill the enemy's plane, when it fly to the overhead of your home, it will throw bomb towards your home, when they have a collsion, you lose the game.

In the whole game, you can hear heart-stirring music all the time.

In the end

During the summer holiday, Zhou Yi sent an e-mail to ALEX to say that we have some difficulty in throwing the bullet and ask for help, which improves that we began doing the project in the summer holiday. We really work hard in the project and overcome mountains of difficulties although there are still some defects in our project which we don't know how to .