Project 2 documentation

Project topic:

Zombie Siege

Game Background:

A zombie virus has been spread in Indianapolis. There are 500 people affected.
You are the only one that can stop this catastrophe.

Game objective:

Your mission is to eliminate 500 zombies.

Game Score:

The game will store **highest kill numbers** and **longest last time** into localStorage.

Controls:

Use W, A, S, D to move the character.
Left click to fire.

Game Levels:

There are 7 levels in this version.
Level 1:   5   enemies (kill 10 enemies to go to next level)
Level 2:   10   enemies (kill 30)
Level 3:   20   enemies (kill 60)
Level 4:   30   enemies (kill 100)
Level 5:   40   enemies (kill 200)
Level 6:   50   enemies (kill 300)
Level 7:   100   enemies   Welcome to level 7 (From Shield)

If player finishes killing 500 zombies, game wins!

Game Interface:

Highest Score: Highest kills

Highest Score: 41, Longest last: 326 seconds, Lives: 3, Kills: 13, Time: 14.509 seconds

Longest Last: The longest game time
Lives: The number of lives left in this game
Kills： The number of kills in this game
Time： The time elapse in this game.

Character:

Moving by W, A, S, D. Firing by left click.
When leave the screen, it shows up in the other side. This trick is important to be survived.
When character collides with zombie, a life will be consumed. When no life left, game over.
There is a sound effect when character collides with zombie.

Zombie:

It is created in border positions and moving to random direction.
It will follow the character in 2% chance. (Makes the zombie stupid enough)

When leave the screen, it shows up in the other side.
When character collides with zombie, zombie disappears. (To avoid repeat collision)
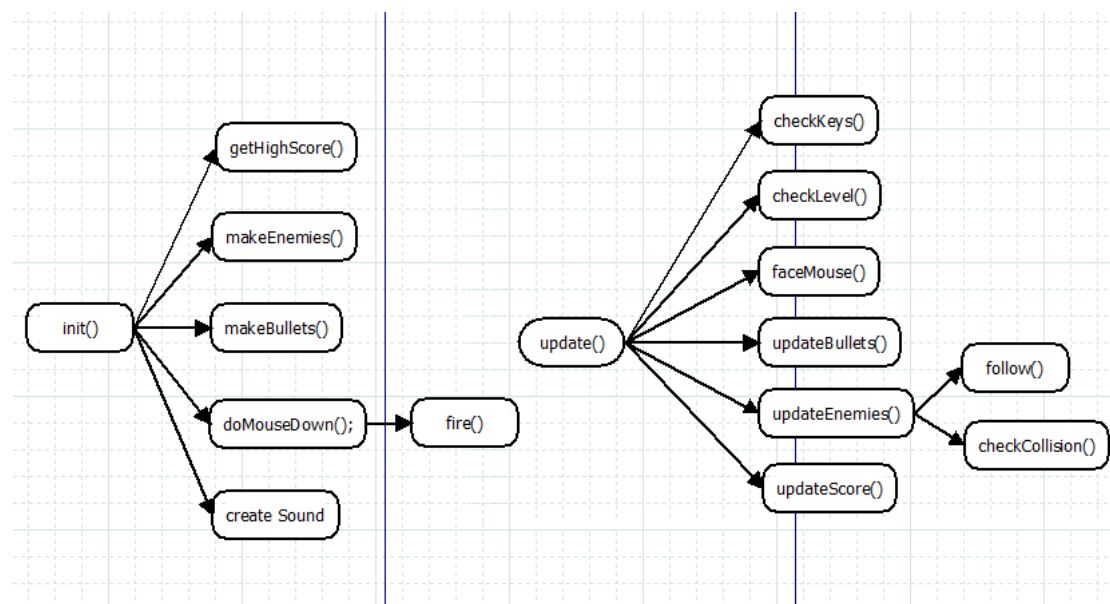
Bullet:

It will be created by left click event. Bullet goes straight to the end and disappears in the border.
There is a sound effect when fired.
When bullet collides with zombie, zombie will be killed. Both zombie and bullet will disappear. Kill counter will be increased by 1.
There is a sound effect when zombie is killed. However, it sounds annoy when a lot of zombies are killed at a short time. So I turn it off.

Code Logic explanation

Critical Functions:

```
function faceMouse() {
    var dx = document.mouseX - character.x;
    var dy = document.mouseY - character.y;
    turnAngle = Math.atan2(dy, dx);
    character.imgAngle = turnAngle;
}//end faceMouse()
```

```
function checkCollisions(enemyNum){
    for (i = 0; i < NUM_BULLETS; i++){
        //When character get hit
        if (character.collidesWith(enemiesArray[enemyNum])){
            HP--;
            hurt.stop();
            hurt.play();
            //output.innerHTML += HP;
            enemiesArray[enemyNum].reset();
            //When character die
            if (HP < 1) {
                saveHighScore();
                alert("You lose");
                game.stop();
                //re-start game
                document.location.href = "";
            }
        }//end if
        //when bullet hit zombie
        if (bulletsArray[i].collidesWith(enemiesArray[enemyNum])){
            //die.stop();
            //die.play();
            kill++;
            bulletsArray[i].hide();
            enemiesArray[enemyNum].reset();
        }  //end if

    } //end for
} // end checkCollisions
```
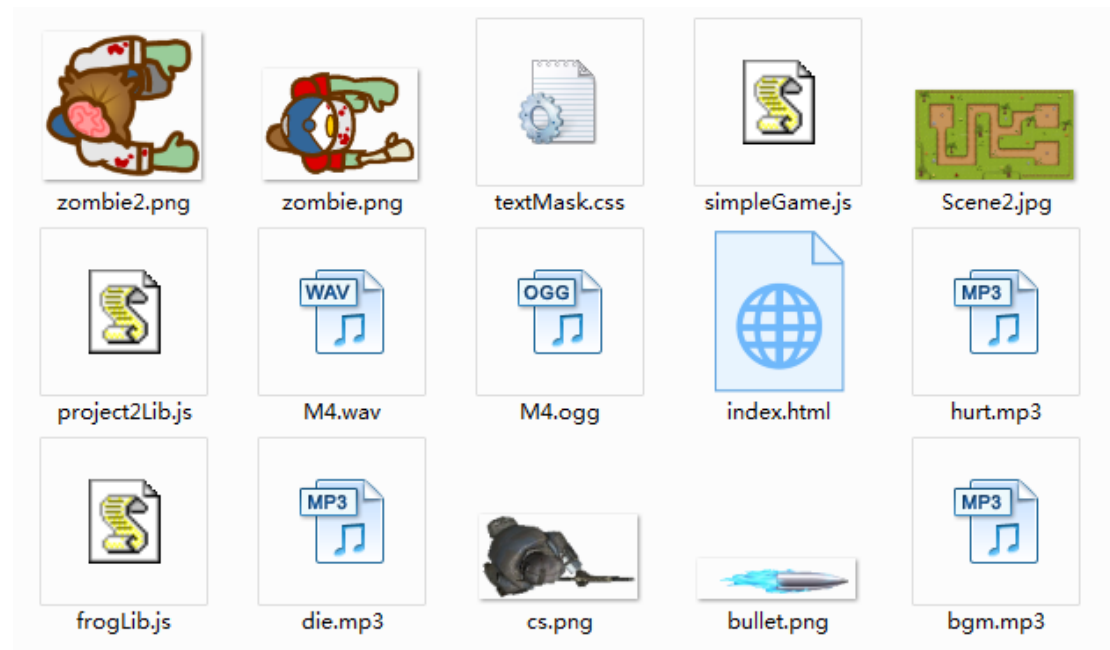
```javascript
function Enemy(){
    tEnemy = null;
    //create enemy using different image.
    imageNum = Math.random();
    //equal probability to create in different image
    if(imageNum > 0.5) {
        tEnemy = new Sprite(game, "zombie.png", 35, 25);
    } else {
        tEnemy = new Sprite(game, "zombie2.png", 35, 32.6);
    }
    tEnemy.setSpeed(3);
    //random the new spawn enemy facing angle
    tEnemy.setAngle(imageNum*180);
    //make enemy follow character
    tEnemy.follow = function(NUM){
        //the enemy IQ: the enemy reaction chance.
        pursueChance = Math.random();
        if (pursueChance > 0.98){
            var zombie_dx = character.x - enemiesArray[NUM].x;
            var zombie_dy = character.y - enemiesArray[NUM].y;
            //find the radians angle between them
            var angle = Math.atan2(zombie_dy, zombie_dx);
            //offset to 0 degress at 12 o'clock direction
            var angleDegree = angle * 360 / (2 * Math.PI) + 90;
            //offset to be always positive
            if (angleDegree < 0) {
                angleDegree += 360;
            }
            //find the enemy direction and modulo to 360 degrees
            var imgAngle2 = enemiesArray[NUM].getImgAngle();
            imgAngle2 %= 360;

            //subtract to get the turn angle
            var turnAngleDegree = angleDegree - imgAngle2;
            this.changeAngleBy(turnAngleDegree);
        }// end if pursueChance
    } // end follow
    tEnemy.reset = function(){
        //set new random position
        var spawnNum = Math.random();
        //output.innerHTML = "spawnNum: " + spawnNum;
        //make enemy coming from borders in equal probabilities.
        if (spawnNum < 0.5) {
            if (spawnNum < 0.25) {
```

```
                    newX = Math.random() * this.cWidth;
                    newY = 0;
                } else {
                    newX = Math.random() * this.cWidth;
                    newY = background.height;
                }
            } else {
                if (spawnNum < 0.75) {
                    newX = 0;
                    newY = Math.random() * this.cHeight;
                } else {
                    newX = background.width;
                    newY = Math.random() * this.cHeight;
                }
            }
            this.setPosition(newX, newY);
        } // end reset
        tEnemy.reset();
        return tEnemy;
    } // end Enemy()
```

Related Files

zombie2.png	zombie.png	textMask.css	simpleGame.js	Scene2.jpg
project2Lib.js	M4.wav	M4.ogg	index.html	hurt.mp3
frogLib.js	die.mp3	cs.png	bullet.png	bgm.mp3

This is a bullet image that creates in photoshop. I shrink a metal image into a bullet shape and overlap with a blue fire layer.

die.mp3   hurt.mp3

These two sounds are recorded by myself and then use audition to edit the db and timeline.
All the sound effects are modified by audition.

Future improvement

1. Add animation circles for character and zombies.
2. Add more weapons. Such as laser, multi fire-rifle.
3. Add a Boss in each level.
4. Use different background in each level.
5. Make the background movable. Game window will always focus on the character. Background move along with character.
6. Multiplayer mode.