2022

Games Design & Development Assignment 1

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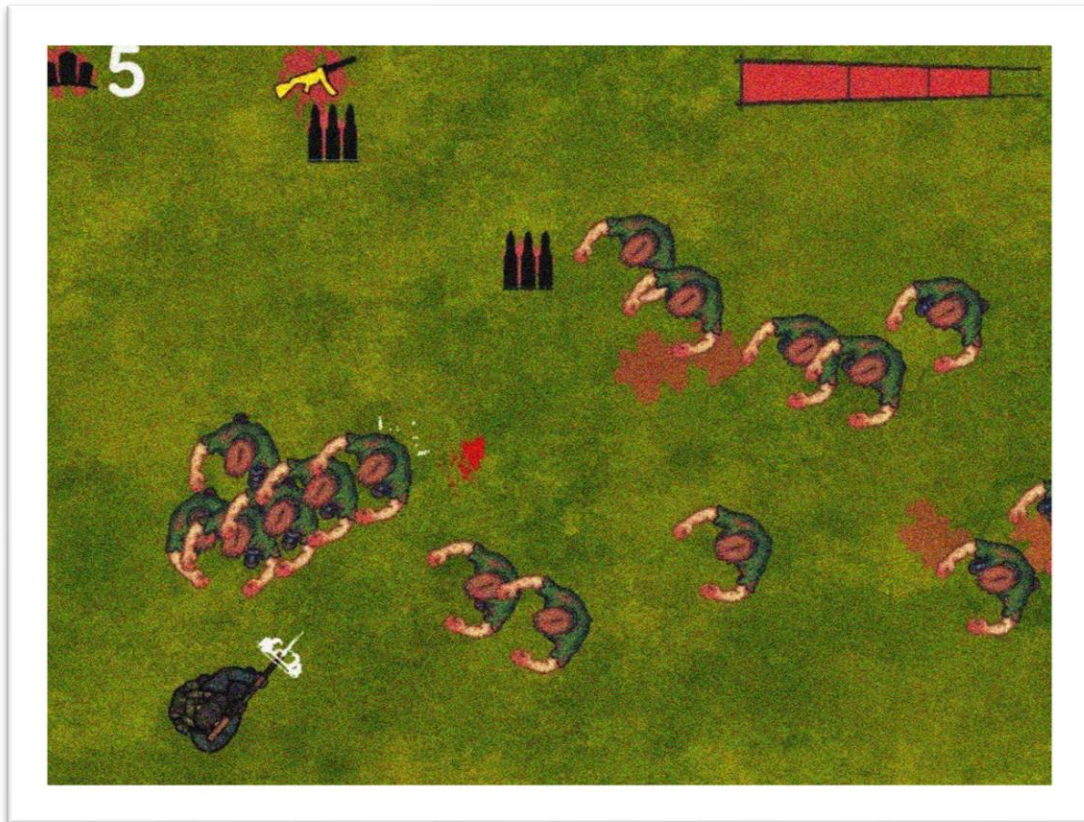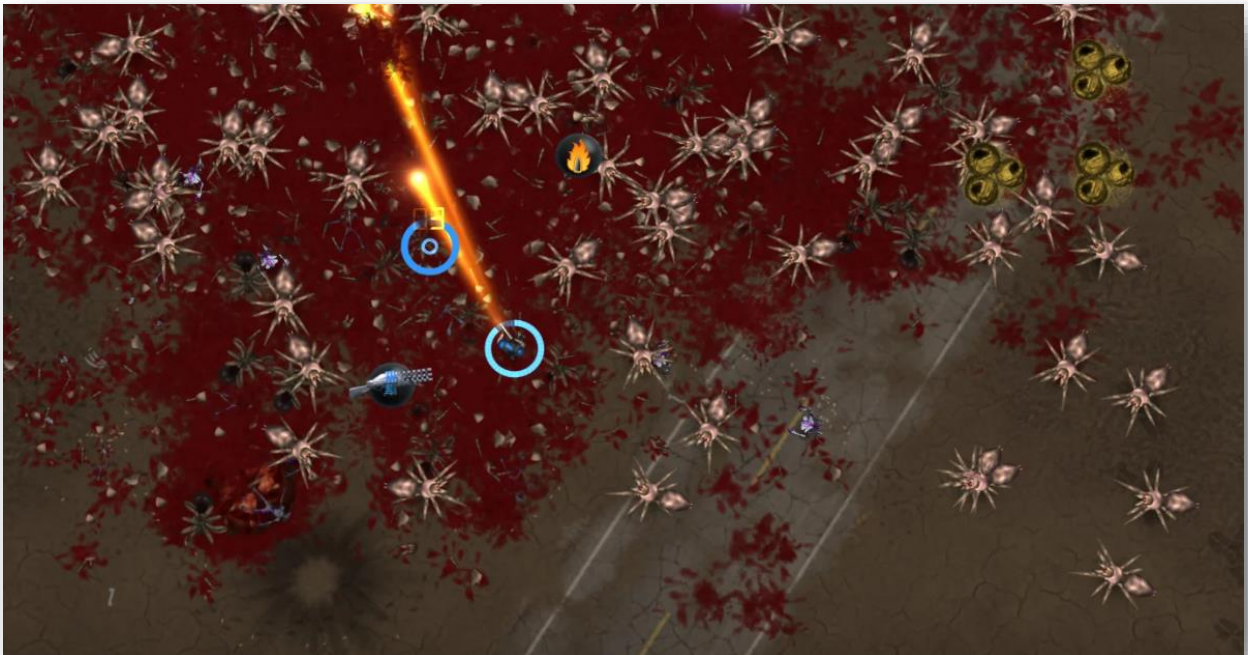10/27/2022

Contents

Game Environment

Hundreds of dead zombies, only handgun and rifle – How long you can survive the onslaught? In 2d top-down arena shooter "Zombie" your screen will be filled with hundreds of dead zombies! Grab your gun and prepare for endless hours of intense top-down shooter fun!

"Zombie" game was inspired mainly by game "Crimsonland".

''Crimsonland'' is a very simple game and at the same time addictive, I used to play it a lot trying to beat my own record. So I decided to create a similar simple zombie top-down arena shooter game just in time for Halloween.

Mechanics
The mechanics of my game is simple, but in some cases very interesting, for example, in my game the player has a state parameter and depending on this state, the player will have one or another animation. My game has such mechanics as walking up, down, left, right, switching weapons, shoots, player and zombie lives and score.

Dynamics
I tried to make the game more visual, lively, so that when the player walked, for example, he would see the walking animation and hear how he walks. So that not only visually, but also by sound, he could determine what he was shooting from. When a player plays my game, he sees how he walks, shoots, reloads weapons, sees how the magazine of his rifle visually decreases and at this time crowds of zombies crawl towards him! And at the same time what only he wants, is to get as many points as possible before he dies.

Aesthetics
In my game, the player experiences a dark sense of hopelessness, challenge and excitement. Depressive music envelops him and he sees that with each beat of the music the number of zombies will only increase and the number of rifle bullets will only decrease.

Game Design
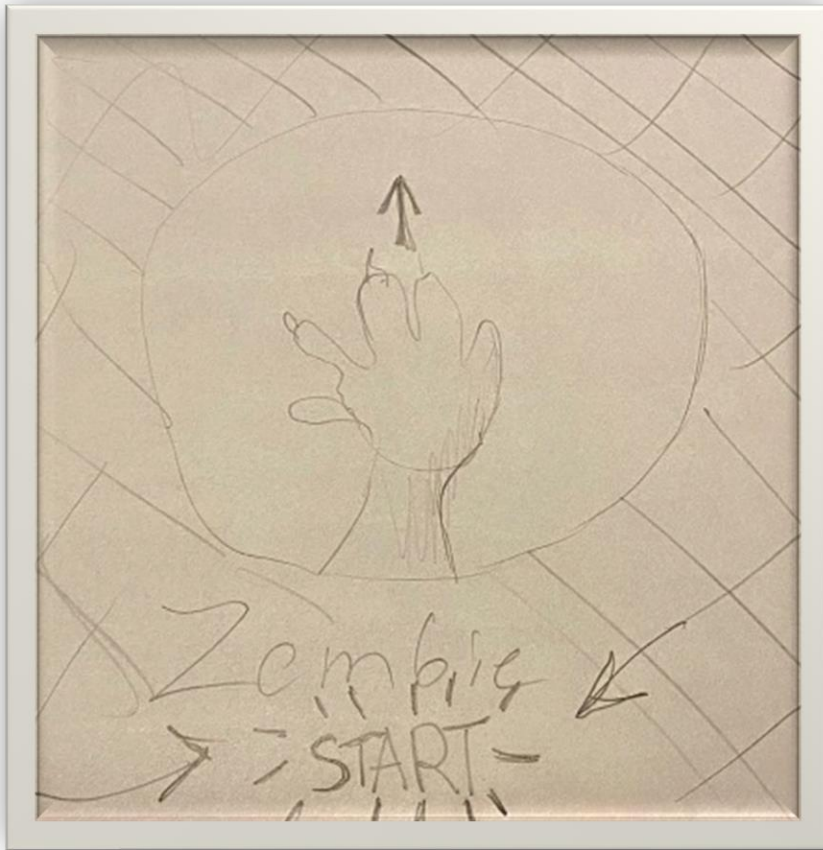
At the beginning of the game, the player meets the main screen with ominous music, a background as dark as night itself and an ominous zombie hand that comes out, in order to start the game the player must press the start button.
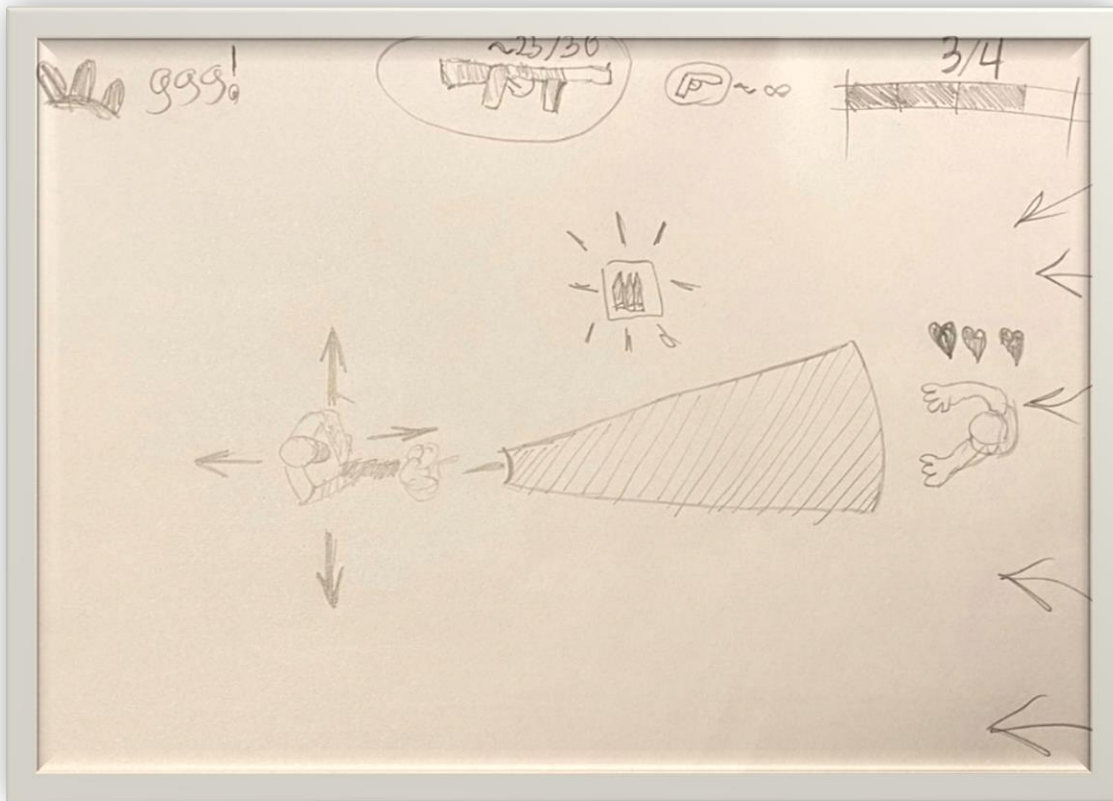
The player can walk up down left right
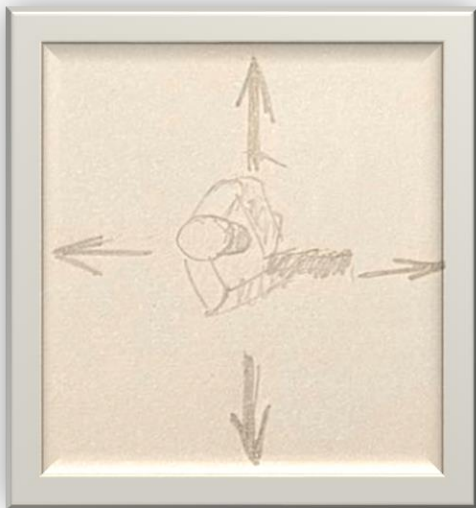
He can fire and reload from two weapons

A pistol with infinite ammo
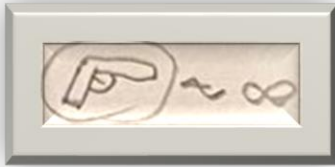
An assault rifle that can have a maximum of 30 rounds in total
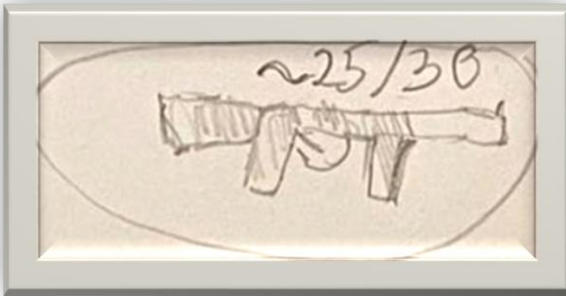
To reload rifle, the player needs to go to the box of ammo.

The player does not shoot accurately and can not always hit zombies

Zombies constantly appear from the right side of the screen, they have three lives and they constantly move towards the player and want to kill him

The player only has a maximum of four lives, and he must save them, because they will not be able to replenish them.
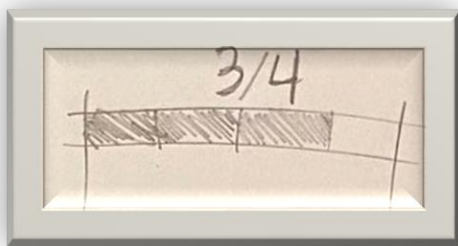
And while he has them, he must score as many points as possible
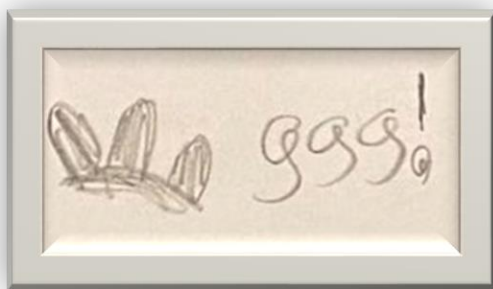
Game Explanation

''Zombie'' is a 2d top-down arena shooter

The setting of the game is a post-apocalypse where zombies have filled the whole world and you are the only one left alive. The target audience of the game is 18+ as the game contains blood and violence. The player defends himself with two types of weapons, a pistol and a rifle, against endless waves of zombies.

The main pieces holding the player are the score counter and the ammo box. At the beginning of the game, ammo drops frequently and the player scores points quickly, but as the game progresses, the ammo drops less and less and becomes harder to pick up as the number of zombies increases. The player, trying to get points at the same pace, begins to ignore the danger and goes to pick up ammo because of which he dies. Feeling annoyed, he wants to start the game again, causing the cycle to start over.

What also holds the player back is that the game itself is simple and perfect for killing time during a break or as a distraction.

Game Presentation

Game play presented in a separate file

Zombie-shooter_1.
mp4

And at the website:
Dato Zombie on Scratch (mit.edu)

Documentation & Reflection

Main Screen/Game over screen:

The Main screen consists of an animated background with effects, and an animated "START" button.

Background: At the start of the game, the background sprite is changed to the initial screen, and "fisheye" and "whirl" effects are applied after playing the effects, the animation starts in 10 frames of the "hand" crawling out. At the end of the game, the background changes to the "Game Over" screen and fisheye and whirl effects are applied. Game have to music sounds, ''Secret mode - Godmode'' which plays at the main screen and ''Sinister – Anno Domini Beats'' which plays after player press start button.
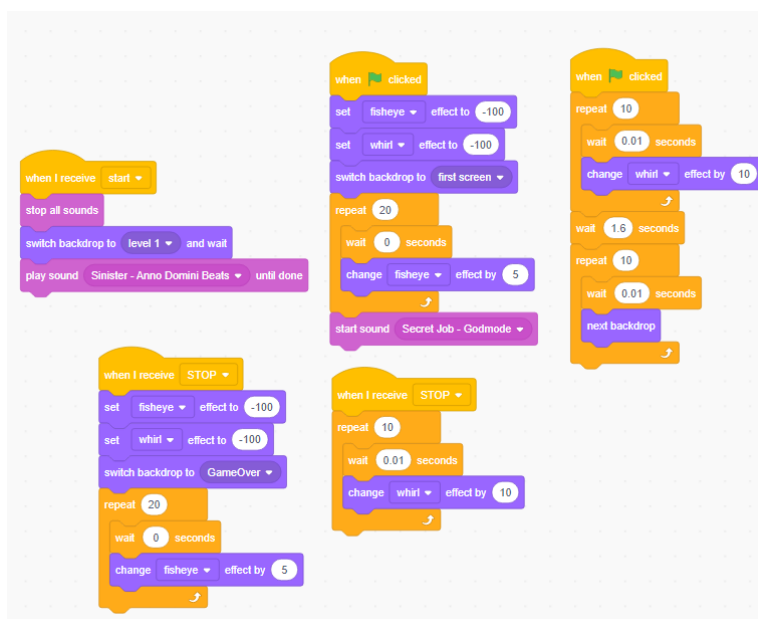
Button Start: Appears with a delay so that the player does not start the game before the initial main screen is played, it has two sprites that change each other when you hover over the cursor. When clicked, the background changes to the game level.

Game Level Structure

Rifle Ammo

Lifebar

Score

User Interface

blood of dead zomibe

Zombie hit sprites

Zombie

Rifle Ammo

Bullet

smoke from gun

Zombie attack animation

Tutorial

Player

R to reload
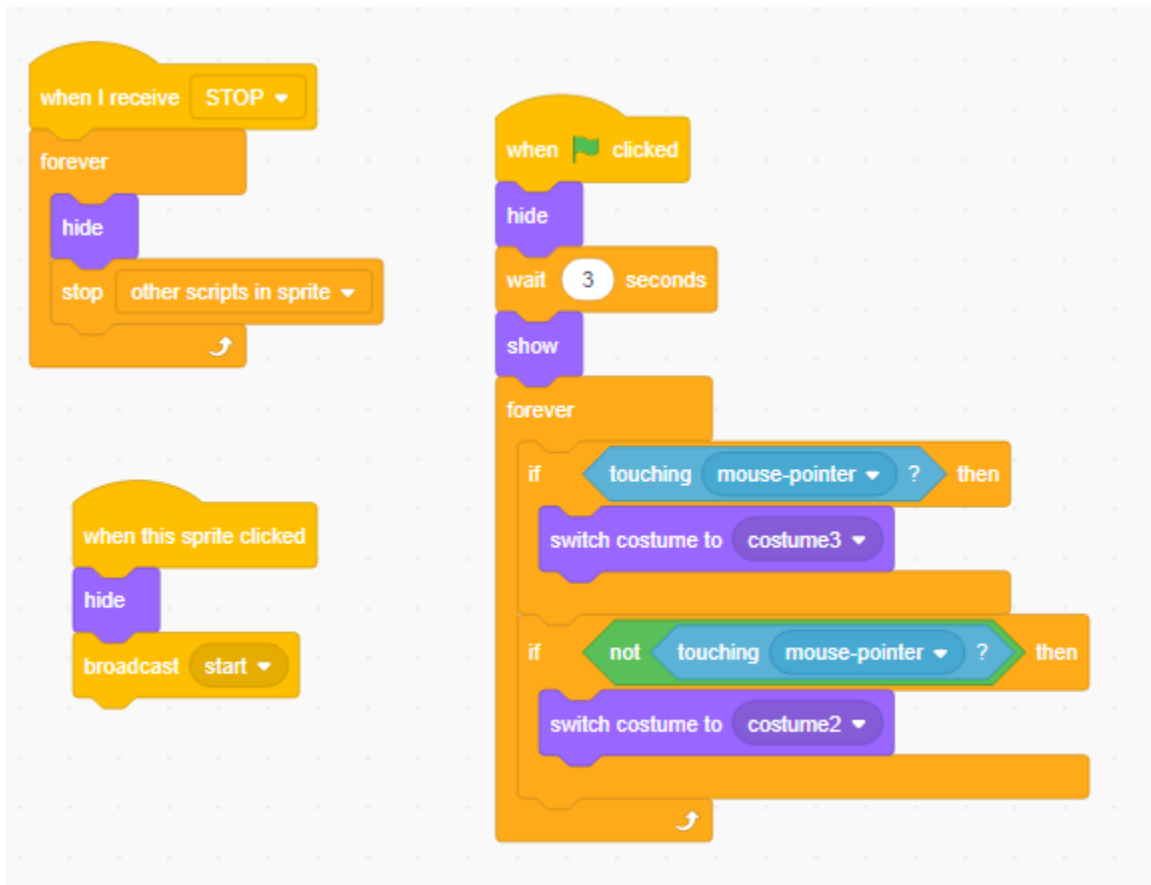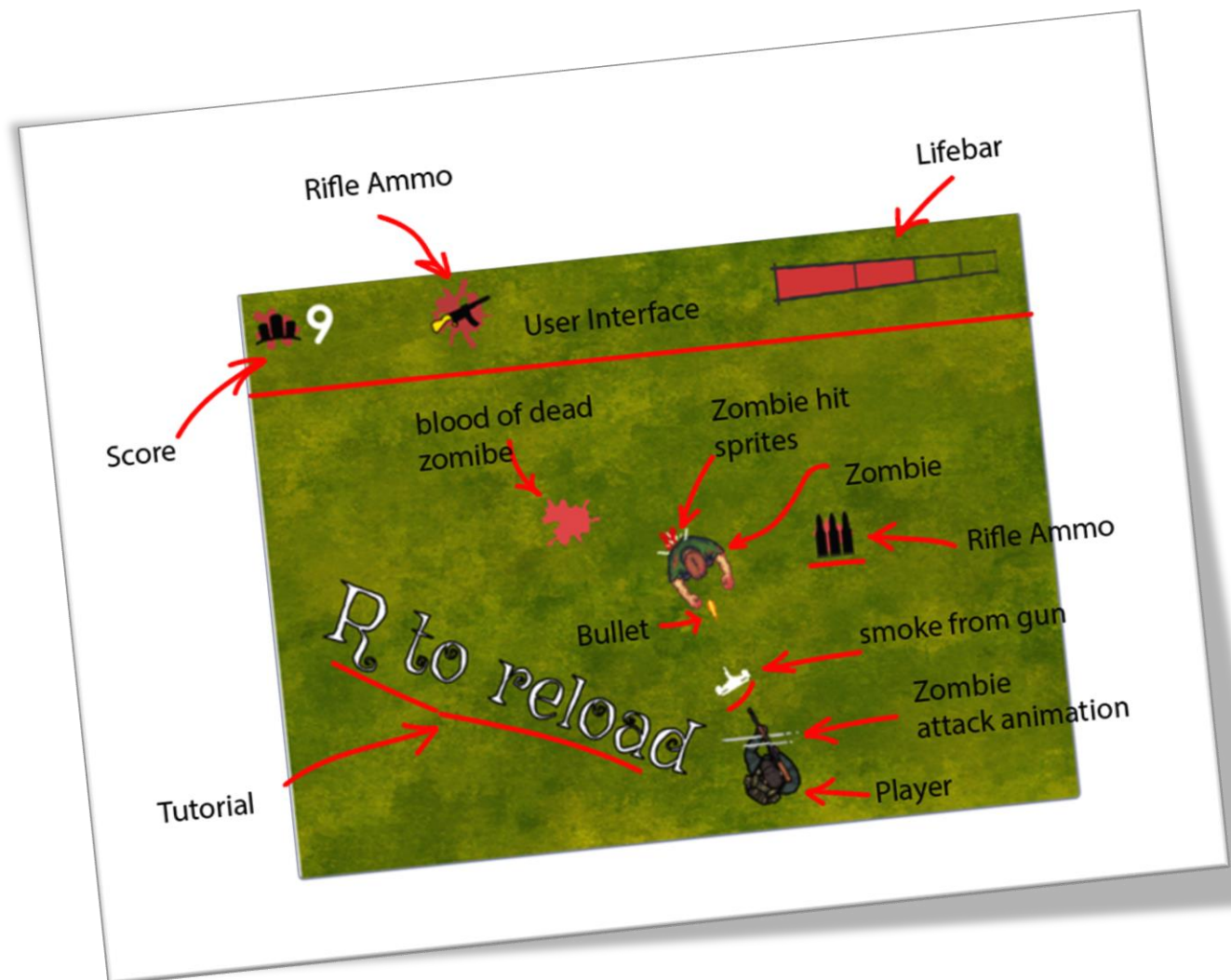
User interface: User interface consist of **Score Count**, **Rifle Ammo** and **life bar.** It gives information to player how many zombies was eliminated, how much ammo approximately has his rifle and how many life he has.

Score Count:

Score count consist Tombstone sprite and sprites of numbers with logic

when I receive start
set size to 45 %
set Kills to 0
set x position of numbers to -200
set maximum length to 10
set width between numbers to 16
go to x: x position of numbers y: 145
repeat maximum length
  create clone of myself
  change x by width between numbers

when I start as a clone
go to front layer
show
forever
  switch costume to letter x position - x position of numbers / width between numbers + 1 of Kills
  if letter x position - x position of numbers / width between numbers + 1 of Kills = ( ) then
    hide
  else
    show

when clicked
hide

when I receive STOP
forever
  hide
  stop other scripts in sprite

Each sprite represent number, and when player kill zombie the score count change by one.

Rifle Ammo:

Rifle ammo interface is an animated sprite. This sprite visually represents how many ammo player has. More ammo player has, more rifle ammo sprite full of yellow colour.
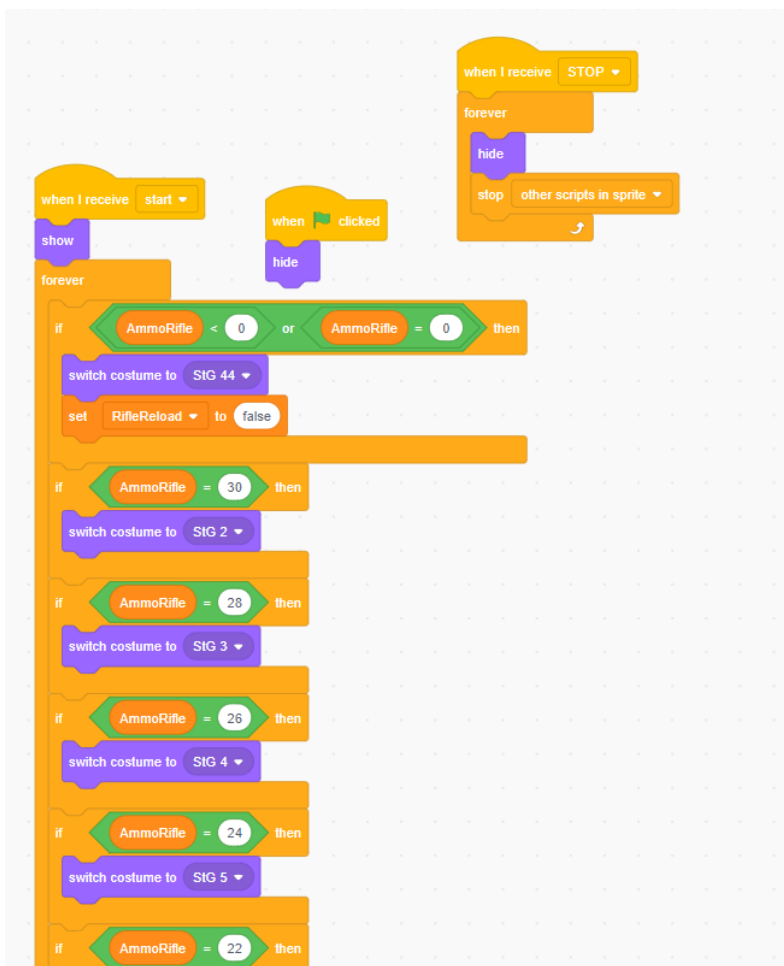
Life bar:

Life bar is animated sprite which represent player health. Player has four life, which are shown as 4 connected red bars. When player gets hit, 1 red bar disappear. When there is no red bars, the game is over. When game is over the script in the life bar broadcast to stop all scripts in game

```
when I receive start ▾
show
switch costume to 4HitPoints ▾
forever
    if  life = 4  then
        switch costume to 4HitPoints ▾

    if  life = 3  then
        switch costume to 3HitPoints ▾

    if  life = 2  then
        switch costume to 2HitPoints ▾

    if  life = 1  then
        switch costume to 1HitPoints ▾

    if  life = 0  then
        switch costume to 0HitPoints ▾
```

```
when [flag] clicked
set life ▾ to 4
hide
```

```
when I receive start ▾
forever
    if  life = 0  then
        broadcast STOP ▾
```

```
when I receive STOP ▾
forever
    hide
    stop other scripts in sprite ▾
```

Tutorial:

Tutorial its just 3 animated text sprites which appear at the beginning of game.
"R to reload"," WASD to Move" and "Press 1 or 2 to switch weapon". They appear with
special effect and each text goes one by one after 3 sec delay.
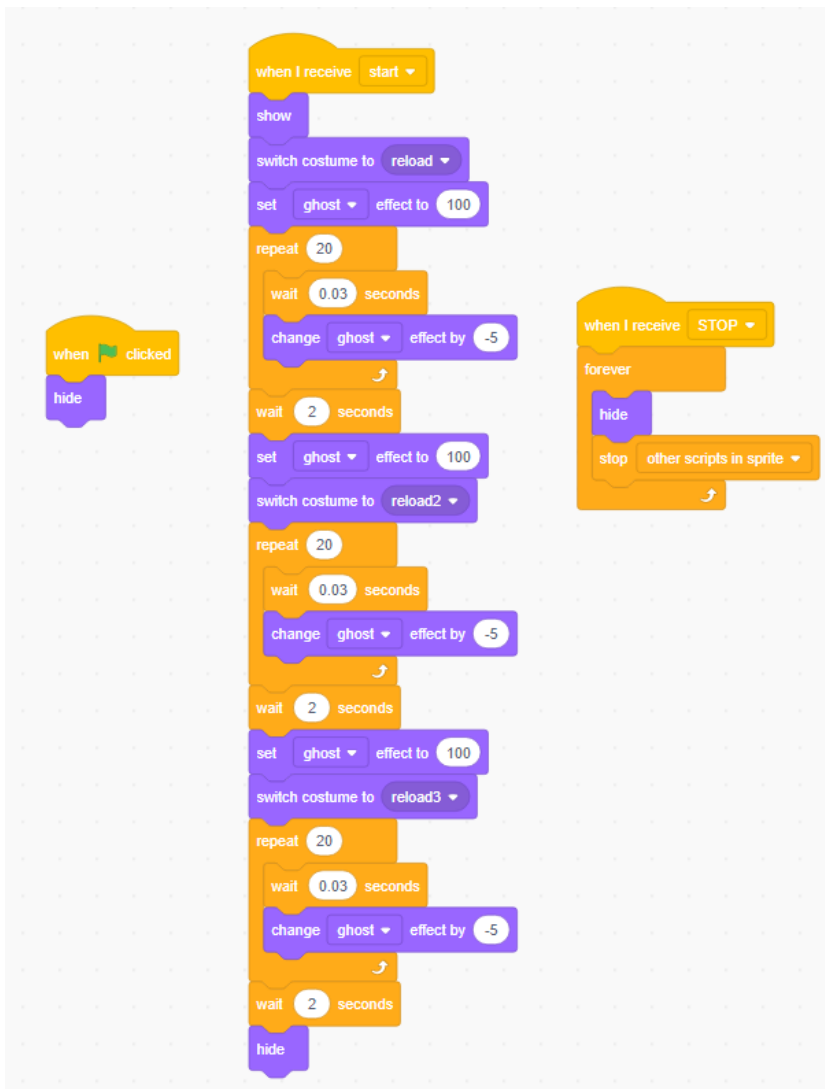
Visual effects sprites
Visual effects sprites consist: Zombie blood sprite, zombie hit sprite, zombie attack sprite,
dead zombie blood, and gun smoke sprite.
Zombie blood sprite and zombie hit sprite

Zombie blood sprite and zombie hit sprite is needed to indicate that player hit a zombie.
When player bullet hit zombie appear two animated sprites near zombie.

```
when [flag] clicked
hide

when I receive STOP
forever
    hide
    stop other scripts in sprite
```

```
when I start as a clone
go to back layer
go to x: zombieX y: zombieY
show
switch costume to m8omAo4
repeat 10
    wait 0.005 seconds
    next costume
hide
delete this clone
```

```
when I receive STOP
forever
    hide
    stop other scripts in sprite
```

```
when I start as a clone
point in direction bullet dir
go to x: zombieX y: zombieY
move 20 steps
show
switch costume to FX046_01
repeat 2
    wait 0.03 seconds
    next costume
delete this clone
```

```
when [flag] clicked
hide
```

Zombie attack sprite

Zombie attack sprite and zombie hit sprite is needed to indicate that zombie hit a player.
When zombie hit player appear animated sprite near player.

```
when I start as a clone
show
go to [front ▼] layer
go to [Player ▼]
point in direction (0)
switch costume to (FX033_01 ▼)
repeat (9)
    wait (0.01) seconds
    next costume
set [Zombie attacked ▼] to (true)
delete this clone
```
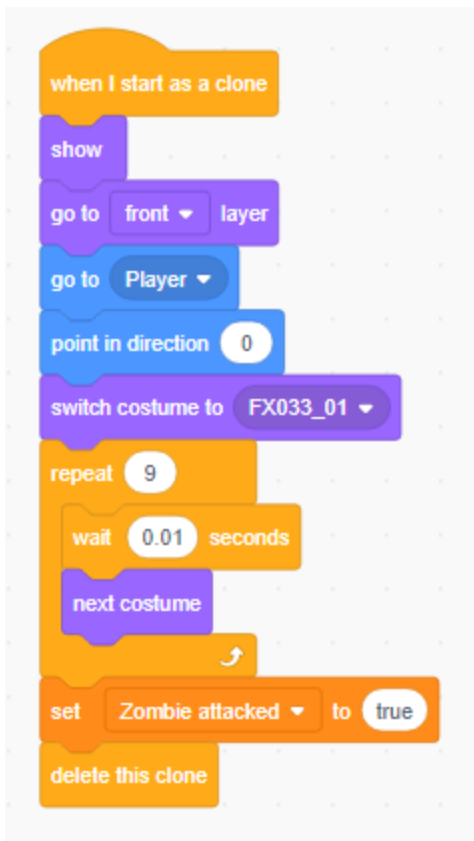
Dead zombie blood
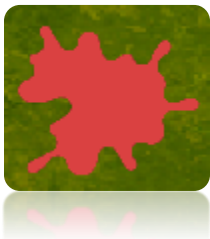
This sprite appear where zombie were killed. It has different variations, and after some time its slowly disappear.
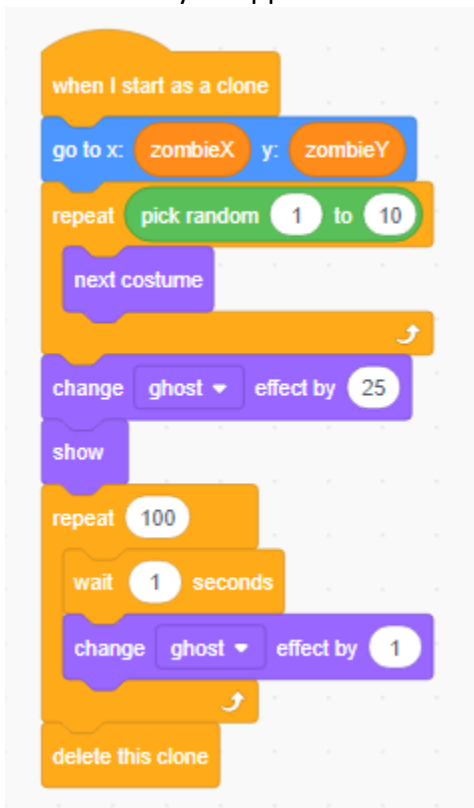
Gun smoke sprite

When player shoot, near gun appear animated smoke of dust, so player know that his gun is working and full of power.
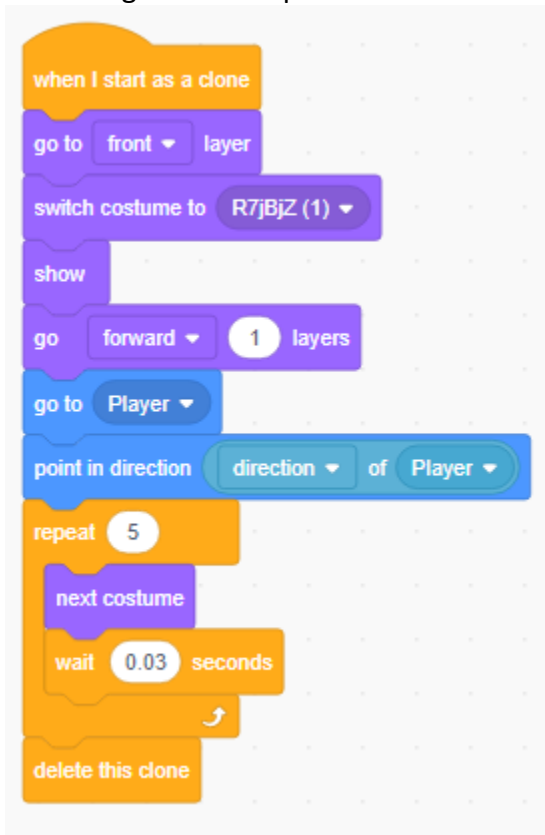
Ammo

Ammo is a very important object. When player pick up ammo, he can reload and shoot from his rifle. Each time ammo appear less and less, making the game more and more difficult.


```
when I receive start ▾
set Timer ▾ to 0
forever
  if 5 < Timer then
    wait Timer seconds
    create clone of myself ▾
```

```
when 🏳 clicked
forever
  change Timer ▾ by 0.5
  wait 1 seconds
```

```
when I start as a clone
show
go to x: pick random -170 to 170 y: pick random -170 to 170
forever
  if touching Player ▾ ? then
    set AmmoRifle ▾ to 30
    delete this clone
```
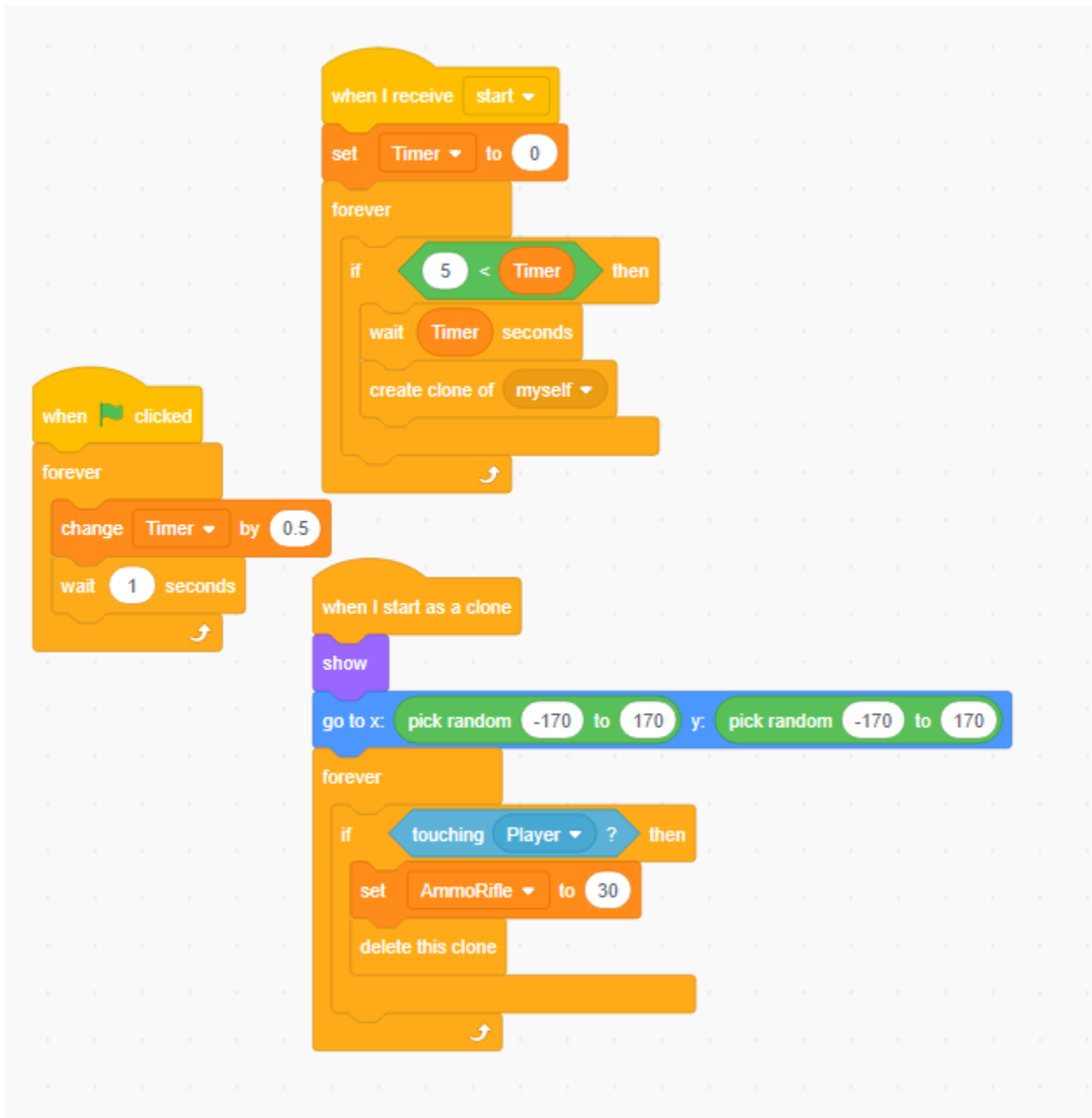
Zombie

Zombie, a character who seeks to kill the main character. Appears 12.5 seconds after the start of the game, has three lives.
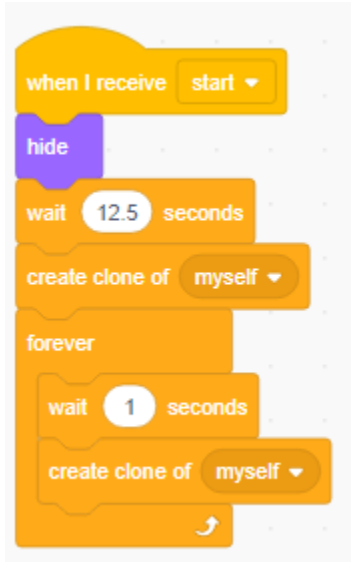
The zombie spawns after 12.5 seconds to give the player time to read the tutorial and get the player in a comfortable position on the map. I set 12 seconds because after 12 seconds the intro passes in the music and each subsequent zombie appears to the beat of the music, every second.

```
when I start as a clone
set zombie life ▾ to 3
show
go to x: 250 y: pick random -170 to 170
forever
    point towards Player ▾
    move 1 steps
    if touching Bullet ▾ ? then
        create clone of zombieHit ▾
        move -10 steps
        create clone of blood ▾
        set Zombie sound ▾ to pick random 0 to 1
        if Zombie sound = 0 then
            start sound hit ▾
        if Zombie sound = 1 then
            start sound hit2 ▾
        change zombie life ▾ by -1
        set zombieX ▾ to x position
        set zombieY ▾ to y position
        set ZombieDir ▾ to direction
        if zombie life = 0 then
            create clone of ZombBlood ▾
            change Kills ▾ by 1
            delete this clone
```

It needs to be hit three times to kill a zombie, each zombie spawns to the right of the screen and always moves towards the player. When a bullet hits him, a hit effect is created near him, the zombie is pushed back a little and a bleeding effect is created. When hit, the zombie will make two sounds of its choice, and the number of lives it will

decrease by one. If his life becomes 0, then he disappears and a bloody stain remains in his place.
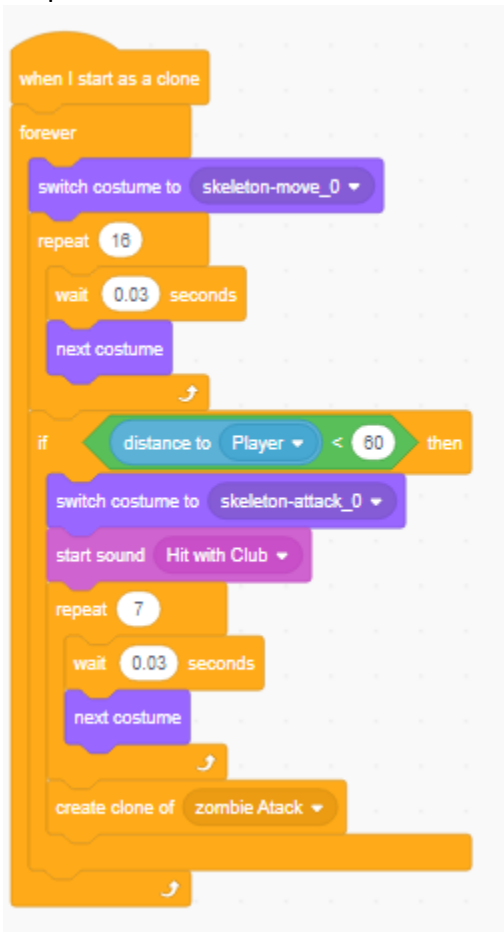
Zombies have walking and attack animations. By default, zombies play a walking animation of 16 frames, if the distance to the player is sufficient for an attack, then an attack animation of 7 frames starts, a sound of impact sounds and an attack effect is created

Player

The main character's task is to live as long as possible. The player has four lives and two weapons - a pistol and a machine gun. To use the assault rifle, the player must pick up ammo and reload the weapon. The pistol has infinite ammo. The assault rifle and pistol have magazines of 30 rounds. The player has several stay states: rest, move, reload, and fire. The state function is made in order to conveniently play the desired player animation.

```
when I receive  start ▾
show
forever
  if   not  key  d ▾  pressed?   and   not  key  a ▾  pressed?   and   not  key  w ▾  pressed?   and   not  key  s ▾  pressed?   then
      set  PState ▾  to  idle

  if   key  d ▾  pressed?   then
      set  PState ▾  to  move
      change x by  3

  if   key  a ▾  pressed?   then
      set  PState ▾  to  move
      change x by  -3

  if   key  w ▾  pressed?   then
      set  PState ▾  to  move
      change y by  3

  if   key  s ▾  pressed?   then
      set  PState ▾  to  move
      change y by  -3

  if   key  r ▾  pressed?   then
      if   key  r ▾  pressed?   and   AmmoRifle  =  30   then
          set  RifleReload ▾  to  true
      set  PState ▾  to  reload

  point towards  mouse-pointer ▾
```

When the user presses A D W S, the player enters the state of movement and moves respectively to the left to the right up and down. If he does not press these keys, then the player goes into a state of rest. If the player presses a key R, then he goes into the reload state and reloads the weapon, if he has cartridges from the machine gun, then he can reload it too. Also, the player is always directed towards the cursor.

```
when I receive  start ▾
forever
    if   PState  =  move   then
        start sound  Walk Fast on Gravel Series ▾
        wait  1  seconds
```

When the player is in a moving state, a walking sound plays. The walking sound is one second long.

```
when I receive  start ▾
forever
    if   key  1 ▾  pressed?   then
        set  weapon ▾  to  gun

    if   key  2 ▾  pressed?   then
        set  weapon ▾  to  rifle
```

If the player presses 1, then his weapon changes to a pistol, if to 2, then to an assault rifle

```
when I receive start
forever
  if  PState = fire  and  weapon = gun  then
    switch costume to survivor-shoot_handgun_0
    repeat 2
      wait 0.03 seconds
      next costume
  if  PState = move  and  weapon = gun  then
    switch costume to survivor-move_handgun_0
    repeat 19
      wait 0.03 seconds
      next costume
    switch costume to survivor-move_handgun_19
  if  PState = idle  and  weapon = gun  then
    switch costume to survivor-idle_handgun_0
  if  PState = reload  and  weapon = gun  then
    start sound Gun Reload2
    set ammo to 30
    switch costume to survivor-reload_handgun_0
    repeat 14
      wait 0.03 seconds
      next costume
```

```
when I receive start
forever
  if  weapon = rifle  and  PlayerState = fire  then
    switch costume to survivor-shoot_rifle_0
    repeat 2
      wait 0.04 seconds
      next costume
    set PlayerState to idle
  if  PState = move  and  weapon = rifle  then
    switch costume to survivor-move_rifle_0
    repeat 18
      wait 0.03 seconds
      next costume
    switch costume to survivor-move_rifle_19
  if  PState = idle  and  weapon = rifle  then
    switch costume to survivor-move_rifle_0
  if  PState = reload  and  weapon = rifle  then
    start sound Gun Reload2
    switch costume to survivor-reload_rifle_0
    repeat 19
      wait 0.03 seconds
      next costume
```

as a result of an unknown bug with the rifle shooting animation I have created another player sate variable and put it here.

The animation functions with a pistol and a machine gun are almost identical. When a player is in the state of a shot and his weapon is a pistol / machine gun, the animation of the shot of a pistol / assault rifle play. When a player has a state of movement, a movement animation plays with one or another weapon. When a player is at rest, depending on the type of weapon, one or another sprite is assigned to him. If the player is in a reload state, then if the player has a pistol selected, then the reload sound plays, the pistol's ammo counter becomes 30 and the pistol reload animation starts. If the player has an assault rifle selected, then the reload sound plays and the machine gun reload animation starts.

```
when I receive  start ▾

forever
    if  < mouse down?  and  not < ammo = 0 >  and < weapon = gun > > then
        start sound  Gunfire ▾
        change  ammo ▾  by  -1
        create clone of  Bullet ▾
        create clone of  Dust ▾
        set  PState ▾  to  fire
        wait  0.6  seconds

    if  < weapon = gun  and  mouse down?  and < ammo = 0 > > then
        start sound  gun Dry Fire ▾
        say  i need to reload!  for  1  seconds
```
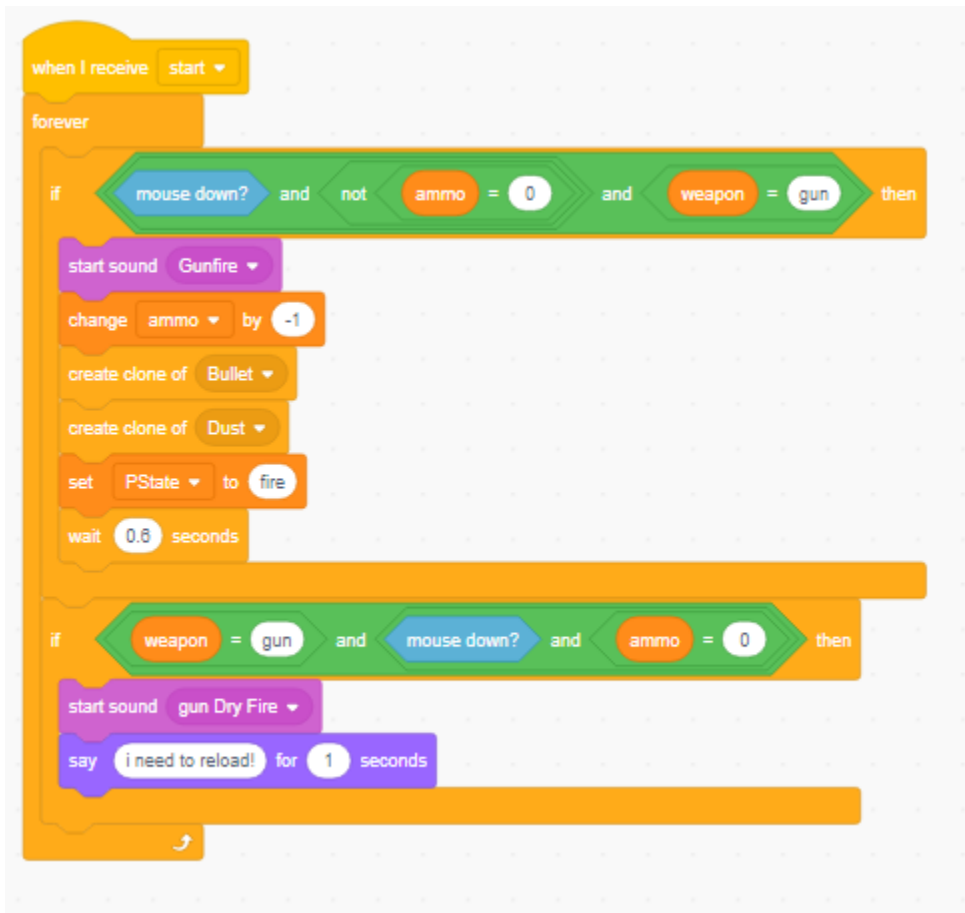
Shooting from a pistol. Shooting with a pistol is possible when the player presses the left mouse button, he has ammo for a pistol and a pistol is selected. When the player shoots, the sound of firing a pistol is played, the number of rounds decreases by 1, a bullet flies out, a smoke effect is created, and the player goes into a state of fire. If the player tries to shoot but he has no ammo, then the sound of a shot from an empty pistol plays and the message pops up I need to reload.
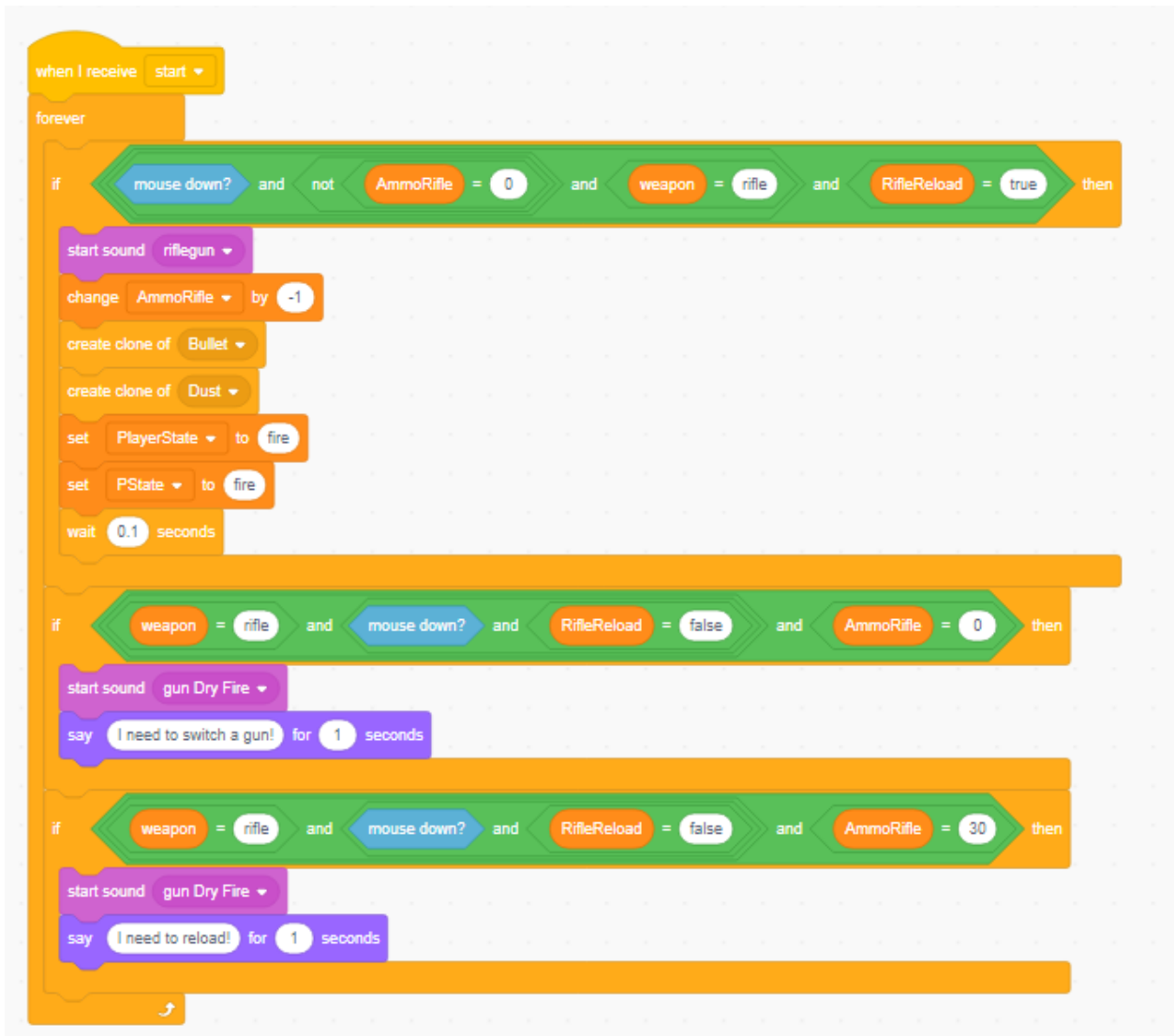
Shooting from an assault rifle. Shooting from the assault rifle is possible when the player presses the left mouse button, he has cartridges for the machine gun, he reloaded and the machine gun is selected.

When the player shoots, the sound of firing from the assault rifle is played, the number of rounds decreases by 1, a bullet flies out, a smoke effect is created, and the player goes into a state of fire. If the player tries to shoot but he has no ammo, then the sound of a shot from an empty assault rifle plays and a message pops up: I need to change weapons!
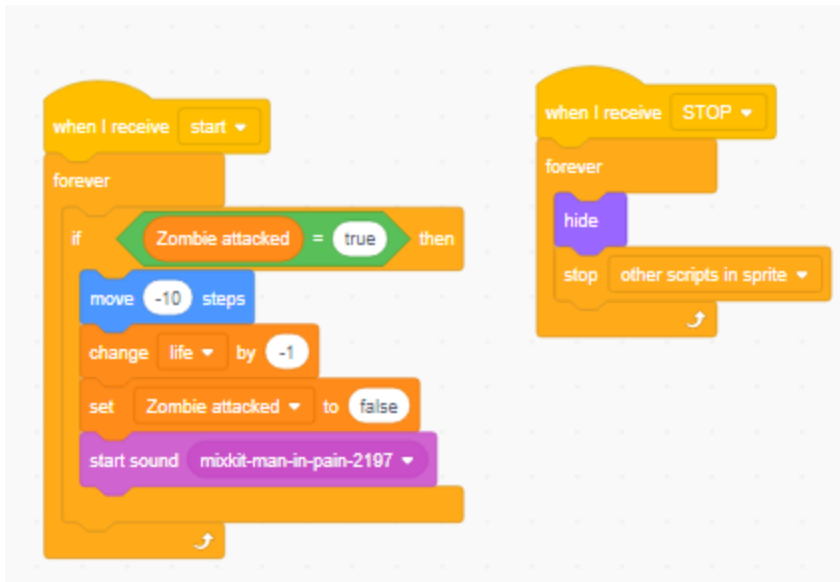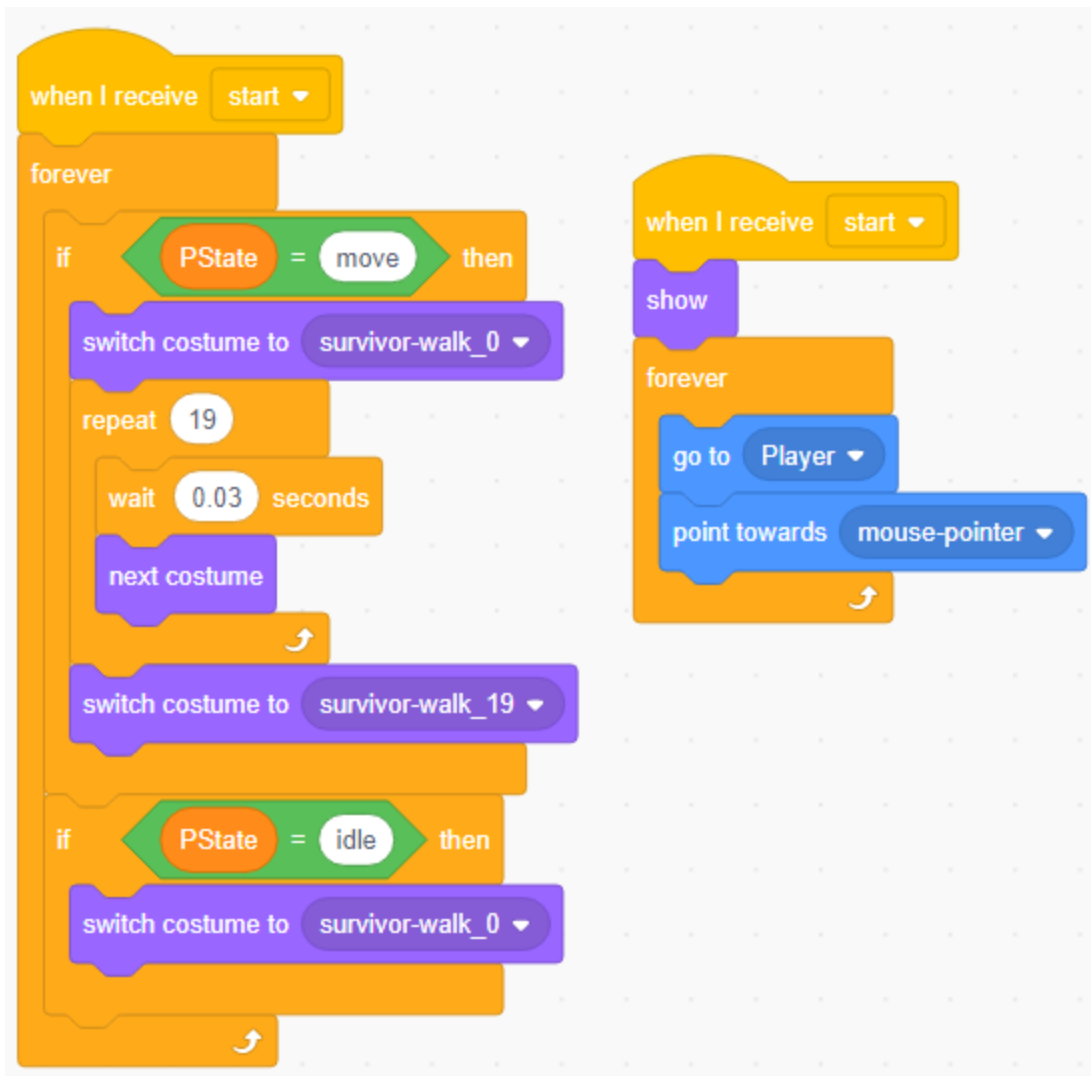
When the player is attacked by a zombie, he pushed back, the number of lives is reduced by one and the sound of pain from the impact plays. When life becomes 0 the player receives the STOP message, disappear and the game stops.

Foots

Since the player has too many animations, I decided to separate the animations of the legs and torso.

```
when I receive  start ▼

forever

    if ⬡ PState = move ⬢ then

        switch costume to  survivor-walk_0 ▼

        repeat 19

            wait 0.03 seconds

            next costume

        switch costume to  survivor-walk_19 ▼

    if ⬡ PState = idle ⬢ then

        switch costume to  survivor-walk_0 ▼
```

```
when I receive  start ▼

show

forever

    go to  Player ▼

    point towards  mouse-pointer ▼
```
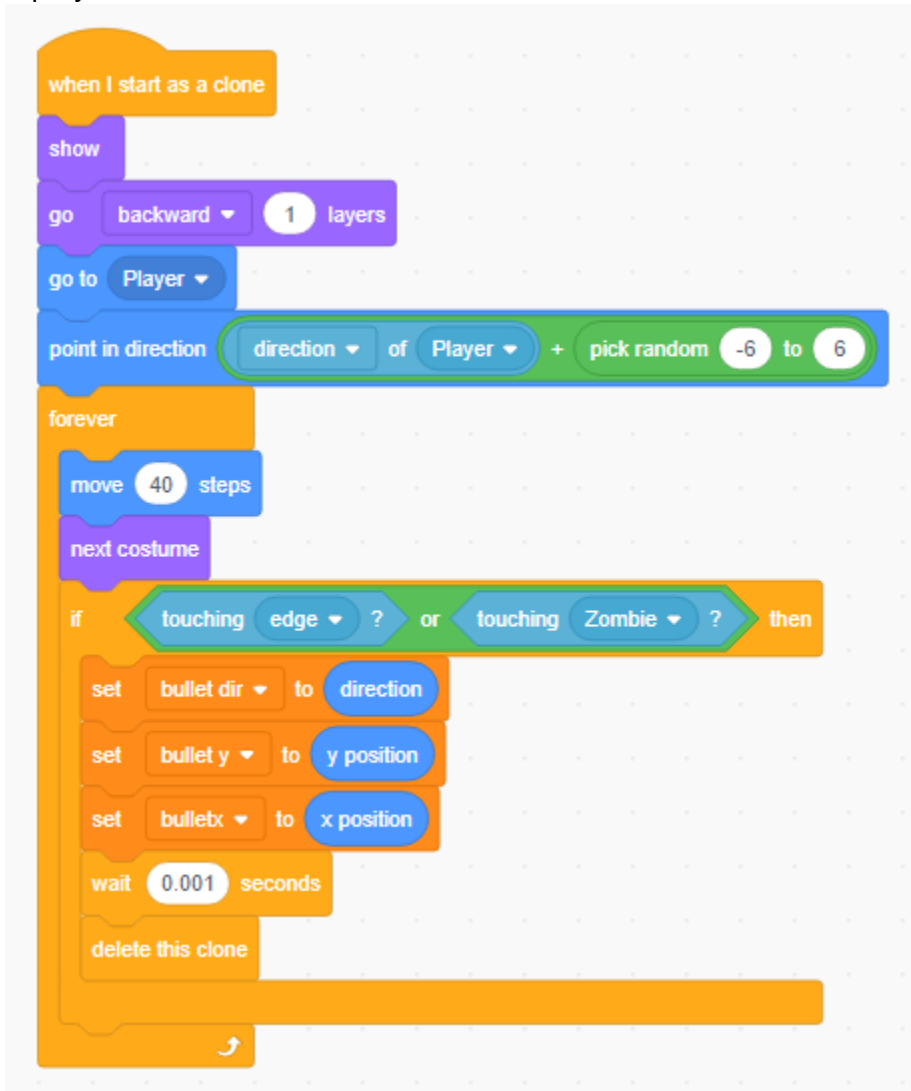
The legs are always directed and are in the same place as the player. When the player has a state of movement, the animation of the movement of the legs plays, when the player has a state of rest, the initial sprite of the legs is shown.

Bullet

A projectile that makes zombies die.

```
when I start as a clone
show
go  backward ▼  1  layers
go to  Player ▼
point in direction  ( direction ▼  of  Player ▼ )  +  ( pick random  -6  to  6 )
forever
    move  40  steps
    next costume
    if  < touching  edge ▼  ?  or  touching  Zombie ▼  ? >  then
        set  bullet dir ▼  to  direction
        set  bullet y ▼  to  y position
        set  bulletx ▼  to  x position
        wait  0.001  seconds
        delete this clone
```

 The bullet always spawns from the player's weapon, and is pointed in the same direction as the player. She has a small deflection angle of 12 degrees to give the shots a bit of realism. The bullet constantly plays an animation of 4 frames. When she touches a zombie or the edge of the screen she disappears.

Variables

Ammo - This variable store information how many pistol bullets do you have

AmmoRifle - This variable store information how many rifle bullets do you have

Bullet dir Bullet Y and Bullet X - This variable gives information to special effects like zombie hit and zombie blood to know on which zombie it needs to appear from what direction

Kills - This variable store information how many zombies do you kill

Life - This variable store information how many life do you have as a player

Maximum length - This variable store how maximum score length number is

PlayerState and PState - This variable is store information of player condition like "move" or "idle"

Rifle Reload - This variable is store information reloaded rifle with ammo or not

The number - This variable is store information of score amount

Weapon - This variable is store information which weapon player hold

Width between numbers - This variable is store information Width between score numbers

X position of numbers - This variable is store information of score position on screen

Zombie attacked - This variable is store information were attacked player by zombie or not

Zombie lifes - This variable is store information how many lifes have zombie

ZombieDir - This variable is store information in which direction zombie is looking

zombieX , zombieY- This variable is store information where the zombie on map

Game Comments

After the game was made, I gave it to my colleagues from my group to test it in order to find out their feedback as players who had never played my game

EamonTKC

Very good use of the graphics, its fun and very intense. High score of 41 kills. Animation and visual effects are great. Would reccomend a quick tutorial but otherwise its extremely well polished

7 days ago   reply ↰

During their game, I found a bug with the invisible tutorial, which I promptly fixed

MariaBrosnanKC

Excellent - maybe just tell the user that they need to pick up a rifle to start shooting :) Also, how do you know when you need to reload?

2 days ago   reply ↩

I also found that players don't know when they need to reload and what to do when they run out of ammo. Therefore, in the final version of my game, my character says when he needs to reload or change weapons.

midnightanimal1986

It's amazing how good this game looks! Proffecionaly made. Loved the visuals and sound effects, as well as the in-game instructions to reload and movement details. Different Zombie mechanics can be added - play with speed of movement, spawn interwals. Ammo counter can be added so the player will know when to reload without the instructions. More veaprons can be added - shotgun and granade will be cool. Amazing project overall!

5 hours ago   reply ↩

In general, I can say that my colleagues warmly welcomed my game and after reading their comments you can see the potential for further development and adding new features

Recourses

I took the music from YouTube studio, the textures of the zombie and player OpenGameArt.org, the visual effects from the site itch.io. All my resources a free to use in commercial and non-commercial use.

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