

# SilverCoders

DIGITAL LITERACY IMPROVEMENT THROUGH EFFECTIVE  
LEARNING EXPERIENCES FOR ADULTS



## CHALLENGE #26 **SPACE INVADERS**

### CODING TRAINING PROGRAMME **FOR +55 ADULTS**



**SILVER CODERS**

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# STRUCTURE OF THE CHALLENGE

## DESCRIPTION

You were provided with a setup that is meant to work as the basis for this space invaders game. In the beginning we can move the ship but you have to make everything else work.

## GENERAL GOAL

In this challenge you are going to create a space invaders type of game where your enemies show up from the right.

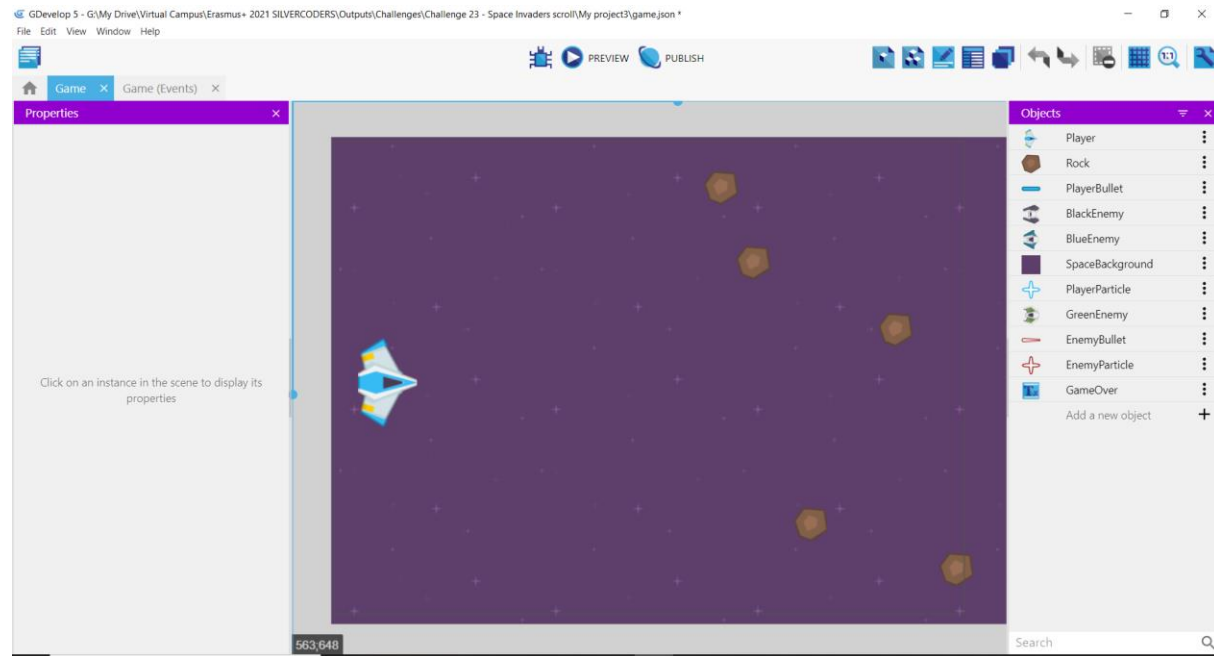
## LEARNING OBJECTIVES

In the end of this challenge, you will be able ...:

- To have experience with a visual programming suite and be able to code standard small piece of software with it.
- Know what statements and command lines are and what they mean for a compiler.
- To be able to write instructions using correct syntax and with minimal errors.
- Know what operators are, what they do and which symbols stand for which operators.
- To be able to understand the assignment of values to variables and how to change them.
- To know all the basic arithmetic operations and how to use them.
- Recognize and know how to use all the data structures related to numbers.
- To know the structures linked to the use of text, such as strings and characters.
- To be able to use If statements correctly to execute code according to a certain defined fixed condition.

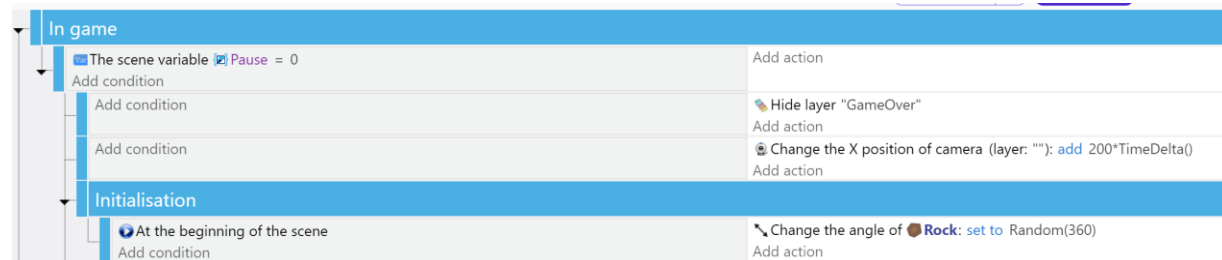
# INSTRUCTIONS

This is your initial setup. There are already some events to make the ship move and fire. But look carefully at the objects that you have available, their properties and behaviours.



## Let's start to code!

In the beginning of the game, we are going to create the various objects for the game and initialize the variables. The variable Pause allows us to check if the player pressed the Pause button. We start the game with the rocks with a random rotations (just to make them look different).



Then we set the events for the creation of our ship and its destruction. We also create a bullet and attach it to our ship's cannon (remember the last challenge?).

Player	
The variable <b>Life</b> of <b>Player</b> $\geq 0$	Create object <b>PlayerBullet</b> at position <b>Player.X()</b> ; <b>Player.Y()</b> + 20 (layer: "")
The timer "PlayerShootTimer" is greater than 0.15 seconds	Create object <b>PlayerBullet</b> at position <b>Player.X()</b> ; <b>Player.Y()</b> + 80 (layer: "")
Add condition	Add to <b>PlayerBullet</b> a permanent force of 1000 p/s on X axis and 0 p/s on Y axis
Add condition	Play the sound <a href="https://resources.gdevelop-app.com/examples/simple-space-shooter/sfx_laser1.ogg">https://resources.gdevelop-app.com/examples/simple-space-shooter/sfx_laser1.ogg</a> , vol: 5, loop: no
Add condition	Start (or reset) the timer "PlayerShootTimer"
Add condition	Add action
Add condition	Add to <b>Player</b> an instant force of 200 p/s on X axis and 0 p/s on Y axis
Add condition	Add action
The variable <b>Life</b> of <b>Player</b> $\leq 0$	Create object <b>EnemyParticle</b> at position <b>Player.X()</b> +Random(20); <b>Player.Y()</b> +Random(20) (layer: "")
Add condition	Add action
Repeat 20 times:	Change the scene variable <b>GameOver</b> : set to 1
Add condition	Delete <b>Player</b>
Add condition	Add action

Then we setup the controls to play the game. We can move the ship that will be always firing.

Virtual controls	
Touch or Left mouse button is down	Add action
Add condition	
The X position of <b>Player</b> > <b>MouseX</b> ("", 0)+10	Simulate pressing Left for <b>Player</b>
Add condition	Add action
The X position of <b>Player</b> < <b>MouseX</b> ("", 0)-10	Simulate pressing Right for <b>Player</b>
Add condition	Add action
The Y position of <b>Player</b> < <b>MouseY</b> ("", 0)-10	Simulate pressing Down for <b>Player</b>
Add condition	Add action
The Y position of <b>Player</b> > <b>MouseY</b> ("", 0)+10	Simulate pressing Up for <b>Player</b>
Add condition	Add action

And we also create the enemies. We have different types of enemies and one of them will actually shoot at us (can you tell which one?). One important aspect here is the Vulnerable name which represents a group of different objects.

Vulnerable (enemies and all objects that can be destroyed by player)	
The X position of <b>Vulnerable</b> < <b>CameraX</b> ("", 0) + <b>CameraWidth</b> ("", 0)	Add action
Add condition	
Living	
GreenEnemy	
The timer "EnemyShootTimer" is greater than 0.6 seconds	Start (or reset) the timer "EnemyShootTimer"
Add condition	Add action
Repeat for each instance of GreenEnemy:	
Add condition	Create object <b>EnemyBullet</b> at position <b>GreenEnemy.X()</b> ; <b>GreenEnemy.PointY</b> ("Centre") (layer: )
Add condition	Add to <b>EnemyBullet</b> a permanent force of -350 p/s on X axis and 0 p/s on Y axis
Add condition	Add action
BlueEnemy	
Add condition	Add to <b>BlueEnemy</b> an instant force of -20 p/s on X axis and $\cos(\text{TimeFromStart}) \times 100$ p/s on Y axis
Add condition	Add action
BlackEnemy	
Add condition	Move <b>BlackEnemy</b> toward <b>Player</b> with an instant force of 50 pixels
Add condition	Add action
Rock	
Add condition	Rotate <b>Rock</b> at speed 10 deg/second
Add condition	Add action

Now you are going to create the conditions for the game, starting by the destruction of our ship and the destruction of the enemies.

Collisions/death	
Collisions with player	
<ul style="list-style-type: none"> <li><b>Player</b> is in collision with <b>Vulnerable</b> Add condition</li> </ul>	<ul style="list-style-type: none"> <li>Play the sound <a href="https://resources.gdevelop-app.com/examples/simple-space-shooter/sfx_shieldDown.ogg">https://resources.gdevelop-app.com/examples/simple-space-shooter/sfx_shieldDown.ogg</a>, vol: 100, loop: no</li> <li>Change the variable <b>Life of Player</b>: subtract 1 Add action</li> </ul>
<ul style="list-style-type: none"> <li>Repeat 4 times: Add condition</li> </ul>	<ul style="list-style-type: none"> <li>Create object <b>EnemyParticle</b> at position <b>Vulnerable.X()</b>; <b>Vulnerable.Y()</b> (layer: "") Add action</li> </ul>
<ul style="list-style-type: none"> <li>Add condition</li> </ul>	<ul style="list-style-type: none"> <li>Delete <b>Vulnerable</b> Add action</li> </ul>
Collisions with player bullets and death	
<ul style="list-style-type: none"> <li><b>Vulnerable</b> is in collision with <b>PlayerBullet</b> Add condition</li> </ul>	<ul style="list-style-type: none"> <li>Change the variable <b>Life of Vulnerable</b>: subtract 1 Add action</li> </ul>
<ul style="list-style-type: none"> <li>Repeat for each instance of <b>PlayerBullet</b>: Add condition</li> </ul>	<ul style="list-style-type: none"> <li>Create object <b>PlayerParticle</b> at position <b>PlayerBullet.X()</b>; <b>PlayerBullet.Y()</b> (layer: "")</li> <li>Create object <b>PlayerParticle</b> at position <b>PlayerBullet.X()</b>; <b>PlayerBullet.Y()</b> (layer: "")</li> <li>Delete <b>PlayerBullet</b> Add action</li> </ul>
<ul style="list-style-type: none"> <li>The variable <b>Life of Vulnerable</b> = 0 Add condition</li> </ul>	<ul style="list-style-type: none"> <li>Play the sound <a href="https://resources.gdevelop-app.com/examples/simple-space-shooter/sfx_twoTone.ogg">https://resources.gdevelop-app.com/examples/simple-space-shooter/sfx_twoTone.ogg</a>, vol: 20, loop: no</li> <li>Delete <b>Vulnerable</b> Add action</li> </ul>
<ul style="list-style-type: none"> <li>The X position of <b>Vulnerable</b> &lt; <b>CameraX()</b> - <b>CameraWidth()</b>, 0) Add condition</li> </ul>	<ul style="list-style-type: none"> <li>Delete <b>Vulnerable</b> Add action</li> </ul>

Finally, what happens if we loose the game (by being hit by an enemy)

Enemy bullets	
<ul style="list-style-type: none"> <li><b>Player</b> is in collision with <b>EnemyBullet</b> Add condition</li> </ul>	<ul style="list-style-type: none"> <li>Create object <b>EnemyParticle</b> at position <b>EnemyBullet.X()</b>; <b>EnemyBullet.Y()</b> (layer: "")</li> <li>Create object <b>EnemyParticle</b> at position <b>EnemyBullet.X()</b>; <b>EnemyBullet.Y()</b> (layer: "")</li> <li>Delete <b>EnemyBullet</b></li> <li>Play the sound <a href="https://resources.gdevelop-app.com/examples/simple-space-shooter/sfx_shieldDown.ogg">https://resources.gdevelop-app.com/examples/simple-space-shooter/sfx_shieldDown.ogg</a>, vol: 20, loop: no</li> <li>Change the variable <b>Life of Player</b>: subtract 1 Add action</li> </ul>

There are a few other ents in the Final version that add up some visual spice to the game. Check them out!

## RESOURCES

Challenge 26 (Basic)