

# Games and Multimedia

## Practical Assignment 1

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### **Course:**

**Game Programming**

# 1. Implemented Algorithms

## Player Character:

For the player's movement and the interaction, we used the new input system. We can move up and down with the 'W' and 'S' keys and left and right with the 'A' and 'D'. The interaction button is 'E'. For the movement we solved, that the player can only move vertically or horizontally. We made a PlayerController script and always check in the VerticalMovement\_performed() or HorizontalMovement\_performed() functions with an if statement that the user finished moving on the other axis or not. For that we used a bool variable. We also created an InputManager script for the input handling it is a Singleton.

## Ground Tiles:

For the ground tiles, when the player exits their trigger, the sprite changes to the visited tile, firstly by checking if the tile was already visited and then by changing the the sprite on the sprite renderer.

## Interactable Blocks:

For all the Interactable blocks we created an Interface with an Interact() function so we could use that same function for each block while having them perform different codes.

When the player approaches an interactable block, by entering the trigger area the block gets darker by changing its sprite to a darker sprite, while doing the opposite when the player leaves the trigger area.

## Blue Block:

For the blue block we created an animation that would change the block's alpha colour from 1 to 0, looking like a "vanishing effect", and at almost the end of the animation there is an event that calls the function Vanish() on the Blue Block script that Destroys the game object.

## Red Block:

For the red block we added a Rigidbody2D and Froze all the constraints.

When the player interacts with it, the constraint for the Freeze Position Y is unchecked and if the player's Y position is higher than the red block's Y position, the red block will move downwards and if the player's Y position is lower than the red block's Y position, the red block will move upwards (by changing the Rigidbody2D velocity).

When the red block collides with anything that is not the Player, it's velocity stops, and all constraints are frozen.

## Grey Block:

For the grey block we used the `OverlapBoxAll()` function to detect all the tiles nearby (that had the `groundTilesLayerMask`) and put them in an array which then calls the function `ChangeTriggered()` (from the Ground Tiles script) for each one of the tiles, which will change the sprite to the opposite the one currently active.

## Game Manager:

For the GameManager script we created a Singleton. In the start method we check all tiles and count them, it will be the maximum number of tiles. Every time the player visits a tile the GroundTiles script change the sprite of the tile to visited, but it also calls a function from the GameManager script. It is the `AddVisitedTiles()`, and it reduces the number of a variable that counts the number of the unvisited tiles. But this function can be called only if the tile was unvisited before. We have also a `RemoveVisitedTiles()` for the gray block that can change the visited tiles back to unvisited.

## UI:

We have a text UI in the scene, it shows the number of the unvisited the GameManager script in the Start method we set the text for the maximum number of the unvisited tiles. After every time we call the `AddVisitedTiles()` or `RemoveVisitedTiles()` we change the text for the UI, so it follows the changes. In the end if the player visited all the tiles, we change the text to "Cleared!".

## 2. Implemented Features

All the features required in the practical assignment corresponding to this evaluation were fulfilled completely.

## 3. Bibliography

During the development of this work, the following references were consulted:

- <https://docs.unity3d.com/ScriptReference/RigidbodyConstraints2D.html>