Piscine Unity - D01

2D physics, Tags, Layers and Scenes

Staff staff@staff.42.fr

Summary: *In this document, you will find the subject for the Day01 of the Unity Piscine of 42.*

Contents

Chapter I

Instructions

- Only this page will serve as reference. Do not trust rumors.

- The exercises have been ordered from easiest to most difficult. Under any circumstance you can submit or take into account an exercise if a previous one has failed.

- Be careful with the access rights of your files.

- You should follow the submit procedure for all you exercises.

- Your exercises will be corrected by your piscine peers.

- You cannot leave any extra file on your repository except the ones explicitly specify on you subject.

- Got a question? Ask your peer on the right. Otherwise, try your peer on the left.

- Everything you need can be found on the `man` or out there on Google.

- Read carefully the exercises: they may contain some features you should implement that are explicitly mentioned on the subject.

- Think about discussing on the forum Piscine of your Intra!

- Use your brain!!!

at least one default constructor, a copy constructor, an

Chapter II

Foreword

Today's starring :

- Thomas - Lonely and slightly naive, Thomas likes to list his observations about the world - and is absolutely fantastic at falling.

- Chris - Pessimistic, irritable and suspicious - Chris might not be the best jumper, but he was doing just fine on his own.

- John - Rather proud of his agility and sportiness, John quite likes an audience so decides to look after Thomas and Chris.

- Claire - Claire lacks confidence, she moves slowly and considers herself rubbish at jumping. But then she discovers that she might be a superhero.

- Laura - Laura isn't great at jumping, although she does have her own unique ability - which, sadly, she's too ashamed to tell anyone about. An ominous pixel cloud has been following her around lately, and this worries the others.

- James - James had always been different. Not least because of his unique disregard for Newtonian laws.

- Sarah - On a quest to find the fountain of knowledge and learn the truth about her world, Sarah sees herself as rather more intelligent than the other "lesser" quadrilaterals.

Chapter III

Exercise 00: Thomas and his friends

	Exercise : 00
	Exercise 00: Thomas and his friends
Turn-in directory : *ex00/*	
Files to turn in : The "ex00" scene's file, a "playerScript_ex00" script on each character, a script for the camera	
Forbidden functions : None	

> ⚠ WARNING! Starting today, and until the end of this piscine, you will turn in all your exercises in Assets/ as explained in the general instructions. NOT in your folders ex00, ex01... Don't take the "Repository folder" line in the exercise's scrolls into account. It is filled automatically during the PDF creation

To start, run the demo so you know where you're going today. You can move the characters with the keyboard arrows and press the space bar to jump. You can change the active character with the 1, 2 and 3 keys. Characters must help each other to pass the levels!

Let's get warmed up with a little exercise. Create a scene with a ground, a camera and 3 characters: Claire, John and Thomas.

You must be able to select a character pressing 1, 2 of 3 and move it using the arrows. The camera is automatically centered on the selected character.

Each character must be able to jump and move right and left. You must be able to reset the scene pressing a key, R or Backspace for instance.

> ⚠️ Warning! You must only create ONE single script that will be applied to all 3 characters.

> 💡 You're free to create other independent scripts, to manage the camera for instance.

Chapter IV

Exercise 01: Exit this way!

	Exercise : 01
	Exercice 01: Exit this way!
Turn-in directory : *ex*01/	
Files to turn in : The "ex01" scene, a "playerScript_ex01" script on each character, and anything relevant	
Forbidden functions : None	

Unity doesn't like duplicates in the scripts. You should create a playerScript_ex01 and copy the previous exercise's code to be able to achieve this new exercise.

Now, the characters must also possess different features:

- Claire, the blue square moves slower and jumps lower than the others.

- John, the yellow stick moves faster and jumps higher than the others.

- Thomas stands between both with an average speed and jump capacity.

You must always use the same script for all your characters

They must not be able to jump several times without falling on a surface - ground or other character. No infinite jump or wall jump!

They must run through a first level that forces them to cooperate to get to the exit. The exit of each character is indicated by an outline representing them. When each character is aligned on their exit, the player has passed the level. You must display a message stating it - for the moment, a simple debug will be enough.

> The level must force cooperation, so characters must not be able to reach the exit without the others.

Chapter V

Exercise 02: Level 2!

	Exercise : 02
	Exercise 02: Level2!
Turn-in directory : *ex02/*	
Files to turn in : `"ex02" scene and anything relevant`	
Forbidden functions : `None`	

You must create a second level using physics layers in the level design:

- Platforms are either white either a character's color.

- Characters can only use white or their color's platforms. They go through the others.

- You must link both levels so that characters go from one to the other when they pass one.

Chapter VI

Exercise 03: Interactivity

	Exercise : 03	
	Exercice 03: Interactivity	
Turn-in directory : *ex03/*		
Files to turn in : `"ex03" scene and anything relevant`		
Forbidden functions : `None`		

It's about to get interesting! Create a level with teleporters and moving platforms.

You will choose to create fast and technical pathways, sadistic elevators, like in a good old retro game where it will take 10 seconds to get the right elevator alignment. The goal is to create a pleasant level to run through, not just a demonstration of virtuosity.

> Don't forget to progressively add your levels to the build.

Chapter VII

Exercise 04: Buttons!

	Exercise : 04
	Exercise 04: Buttons!
Turn-in directory : *ex04/*	
Files to turn in : `"ex04" scene and anything relevant`	
Forbidden functions : `None`	

Now, create a level with switches that open doors. Even better, color switches that open color doors.

Better yet! White switches take the color of the character that activates them and open the matching color doors...

Finally, switches that change the platform colors so the path the characters can use.

You're clearly free to design this level as you like as long as you set buttons that work as described above.

Chapter VIII

Exercise 05: A deadly game!

![icon]	Exercise : 05

Exercise 05: A deadly game!
Turn-in directory : *ex05/*
Files to turn in : `"ex05"` scene and anything relevant
Forbidden functions : `None`

For the last level, we're going to set the difficulty a little higher so the player doesn't have the feeling they're just walking around:

- Create color turrets that shoot regularly. The shot only hits the same color characters.

- Create traps on the ground or in the air.

- Create holes. The camera will not follow a character falling in a hole.

- If a character is hit by a turret shot, hits a trap or falls in a hole, the game is over.

> You can code everything with yesterday's and today's lessons. Don't use any other system, especially with timed actions and coroutines to manage the turrets' shots. We'll see about that later.