Stan Li 6/7/2018

Apple Picker

Question sheet –

1. How do you save data for later use by your Unity application?

Click save project.

1. Where is data saved for later stored? (check the documentation)

Storage and Assets folder.

1. How do you create prefab instances using a script? What parameters are needed?

If you put the prefab into a directory called Resources inside your Assets directory, you'll be able to use the Resources class and its load functionality. This will load a prefab up as a GameObject, which can then be instantiated.

1. What is the difference between an orthographic and a perspective camera?

Orthographic is commonly used in engineering as a means to produce object specifications that communicate dimensions unambiguously, each line of 1 unit length (cm, meter..whatever) will appear to have the same length everywhere on the drawing. This allows the drafter to dimension only a subset of lines and let the reader know that other lines of that length on the drawing are also that length in reality. Every parallel line in the drawing is also parallel in the object. If you are looking at a larger scene with buildings then orthographic rendering gives a clearer measure of distance between buildings and their relative sizes. With perspective mode lines of identical real-world lengths will appear different due to fore-shortening. It becomes difficult to judge relative dimensions and the size of objects in the distance. While modelling nothing stops you from switching between orthographic and perspective mode to get a better sense of the object.

1. With a .1 chance to change directions, how would you describe the movement of the AppleTree? Does this make sense given the location of the movement change test?

The movement increases to the left and right. Yes.

1. What is the utility of Time.deltaTime when calculating movement rates? Can you state generally what the purpose of Time.deltaTime does?

You must always use Time.deltaTime when moving objects over time, either by supplying it yourself or by making use of functions like SmoothDamp that use Time.deltaTime by default (hardly any functions do that though). But you must never use Time.deltaTime for input that's already framerate-independent, such as mouse movement, since in that case using Time.deltaTime will do the opposite of what you intend.

1. What is the range of values returned from Random.value?

Gives you a random number between min and max, with outputs closer to min being more common, falling off linearly toward the max.

1. What is the purpose of the Invoke() function?

Ultimately they are identical. The difference is in performance and benefits. If you directly call a method then the compiler will generate the necessary code to look up the method start address in the object's virtual table, push the parameters onto the stack and invoke the method. The runtime is ultimately responsible for dealing with this because a vtable can change depending on the object being used. Highly optimized and very fast given modern processors. This is the ideal mechanism to use. The problem is that you must know at compilation time the type being referenced, the method name and its signature. This is formally known as early binding. If the method information changes then your code won't compile. Normally this is no problem but sometimes it is important. This is where invoke comes in.

Invoke is commonly used in UI code. In UI code a fundamental rule of Windows is that you can only interact with the UI on the thread that created the UI. Therefore if you want to talk with the UI on a secondary thread (such as a worker thread) you must marshal the call to the correct thread. Note that this applies to events as well. They are really nothing more than method invocations. The Control.Invoke method that is inherited by all WinForm controls allows you to call an arbitrary method on the UI thread. The method handles the process of marshalling the request to the correct thread and then calling Invoke on the method. This is still late-binding even though you know in advance what method you wanted to call.

1. What property tells a script where a GameObject exists in the world?

TypeScript

1. Describe the process you need to use if you have two classifications of objects that need to be under control of the physics engine, but that shouldn’t interact with one another if they collide.

Rigid body

1. What represents the ground in this game? How is this different than the ground in roll-a-ball?

The plain is the ground. It is a 3d object.

1. What is the difference between the lines Destroy(this) and Destroy(this.gameObject) in a script?

Destroy(this) means to destroy the script that is running and nothing more. Destroy(gameObject) means to destroy the game object, including any scripts that happen to sit on it. Destroy(gameObject) will remove the entire game object from the scene. Destroy(this) removes this script from the game object.

1. What happens to the playability of the game if you move the position of the camera or change the size of the camera? What problems can you identify?

The scene is either too big or too small.

1. In English or psuedoCode, describe the process by which you match the motion of an object on screen to the location of the mouse.

Mouse code script.

1. What is the difference between how Baskets remove apples when compared to how the rolling ball removed PickUps? Does it matter to the player?

It dosen’t matter to the player. Basket destroys the apple and increases the score. Rolling ball adds the pickup into the score.

1. What objects get added to the hierarchy when you add a GUI?

A GUI program is written as a subclass of Frame - the top-level container

This subclass inherits all properties from Frame, e.g., title, icon, buttons, content-pane

1. What type of data is returned from a call to GameObject.FindObjectsWithTag(<string>)?

Instantiate.

1. What data type is used to store the collection of Baskets?

Game Object.

1. What needs to be added to the start of a script to enable the data type used to store Baskets?

Game Object.

Exercises:

1. Can you write a script that instantiates 10 cube prefabs, all in a row along the positive Z axis, starting at the origin? Create a new scene, attach the script to the MainCamera and run to see your results

yes

1. Modify your previous script to make an 8 by 8 grid, on the x-z plane, starting at the origin.
2. Can you modify the basket script so that it will follow the mouse in both the x and y directions?

Yes.

1. Can you do it and maintain the stack of baskets?

Yes.

1. What needs to change to make ApplePicker behave more like Kaboom, where the player completes waves, the game pauses, and the next wave speeds up?

Script that times and speeds up the code.

1. Try to implement the waves mechanic