2D Infinite Lap Runner Kit

Thank you for buying 2D Infinite Lap Runner Kit. I appreciate if you post a review and rate this product after checking it out.

Build Settings

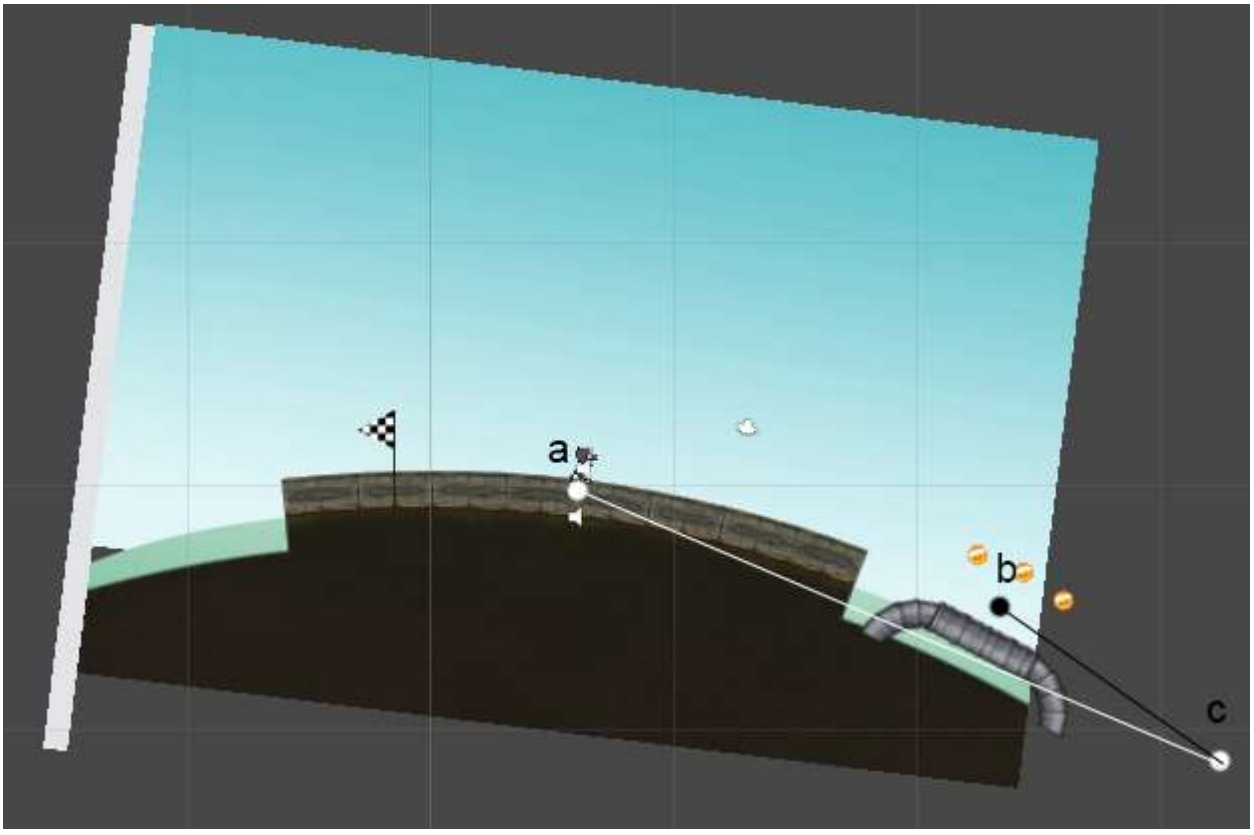
There are 2 scenes in this kit. By default, both of them should already be in the build settings, but somehow they are not, please add them to the 'Scenes In Build' list and make sure the scene 'Menu' has an index 0 and scene 'Game' is indexed as 1. These indexes will be used to switch scenes later on.

Game Controls

The default 'Jump' key is space for web and standalone platform. It can be changed in 'Edit – Project Settings - Input'. You can use left mouse click to jump as well. On iOS or android device, a single screen touch is equivalent to a left mouse click. Theoretically this game should be able to run on mobile devices, It hasn't been tested though as I don't have a Mac at the moment. Any feedback would be appreciated and I will try to find a way to test.

How the Random Terrain Works

Since we are working on a circle, things become a little bit of tricky. But don't be afraid, all we need are a few basic trigonometric function calculation (we will discuss this in the next section). Let's talk about how platforms are spawned first using the script 'PlatformSpawner' in the 'Spawner' folder.



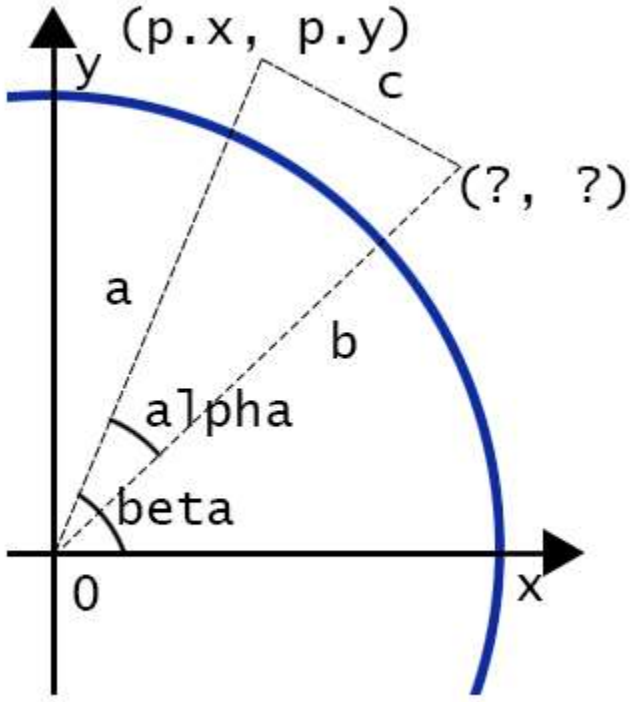
1. We get player's grounded position (point a in the picture). Since player could be jumping or running and we don't want our calculation affected by player status, we use the grounded position. You can think it as the player's x, y position if player is never going to jump.
2. We calculate the spawn point c by the given length ac. This is pure mathematics and will be discussed in the next section.
3. We compare the distance between c and b which stores where the last platform was spawned. If the distance is big enough to fit a platform, we spawn a new platform at c and store this position into b.

Each time a platform is spawned, we also will roll a dice to decide if another other stuff needed to spawn with the platform. Currently we have 4 types of stuffs: coins, powerups, obstacles and nothing, but you are always welcome to add more. They all use or inherit from the 'Spawner' script in the 'Spawner' folder.

the 'Scary' Math

Trust me it's quite straightforward, but if you are happen to be math phobic, feel free to skip this section.

Let's consider the follower scenario, we have a triangle with lengths a, b and c. We also kown 2 vertics (0, 0) and (p.x, p.y). All we want to know is the other vertex.



1. In order to solve the problem, we need to figure the angle alpha first. Thanks to the rule of cosines, it's super easy.

$$\cos(alpha) = \frac{a^2 + b^2 - c^2}{2ab} \Rightarrow alpha = \arccos(\frac{a^2 + b^2 - c^2}{2ab})$$

2. We calculate the angle beta next

$$\tan(beta) = \frac{p.y}{p.x} \Rightarrow beta = arctan\left(\frac{p.y}{p.x}\right)$$

3. Now we know the angle between length b and x axis, which is $beta - alpha$. We can use this angle to calculate the positon of the last vertex.

$$x = \cos(beta - alpha) * b$$
$$y = \sin(beta - alpha) * b$$

We will use this technique quite often, for example calculating spawn point and camera position. You can find the code in the script 'Trigonometricf' in the 'Utility' folder.

Custom Platforms

Those stuffs spawned with platforms are quite easy to replace with your own art work, but the platforms might not be that straightforward as the platform itself is not straight. There are 2 settings affect how you should make your own platform, 'GroundRadius' in 'GameManager' and 'PlatformLength' in 'PlatformSpawner'. Ground Radius decides the size of the circle which you are running on and Platform Length decides the length of the platform. I recommend you decide the proper Ground Radius in your game first, then make platforms fit your ground curve, finally adjust the Platform Length to make sure platforms are spawned seamlessly.

Final Word

I highly recommend you go through every scripts and have some ideas of what each script does. If you have any questions, concerns, problems, or suggestions with the kit, please feel free to email me: j.harrison.runner@gmail.com.