# AppInventor Tutorial - Space Invaders

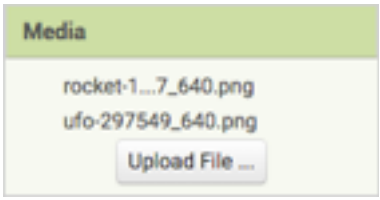
## Objectives

Here we will create an Android app. The goal is to hit the alien with a ball thrown by your rocket to earn as many points as possible.
Start by signing into App Inventor and create a new project called “SpaceInvaders”.

## Part 1 - Design

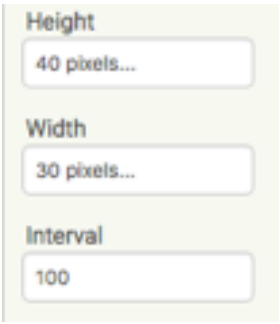

### 1. Add a canvas (Component: Canvas)

From the left area “Palette”, go to Drawing and Animation, click on Canvas and move it into your app. We will change the parameters of the canvas by going in the “Properties” area on the far right. Set the background color to black and change the size by doing this:



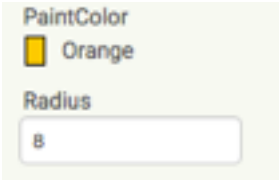

### 2. Add 2 images (Component: ImageSprite)

Below component, go to Media and click on Upload File to upload your images. We uploaded two images: a rocket and an alien, royalty-free (to find royalty-free images, go to pixabay.com).




From the left area Palette, go to Drawing and Animation, click on ImageSprite and move it into your application. Repeat the operation. Make the picture of the first ImageSprite the rocket and the picture of the second the alien. Then, Rename the images (Component -> Rename): Call the rocket “Rocket” and the alien “Alien”. Then, adjust the size of the images like so:

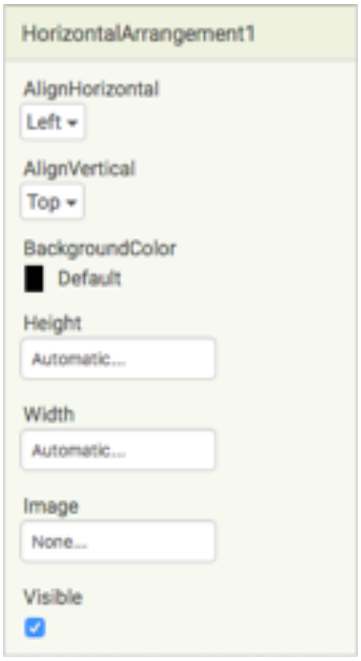
### 3. Add a ball (Component: Ball)




From the left area Palette, go to Drawing and Animation, click on Ball and move it into your app. Change the ball’s color to a light one. We put it in orange. Change its radius to 8.

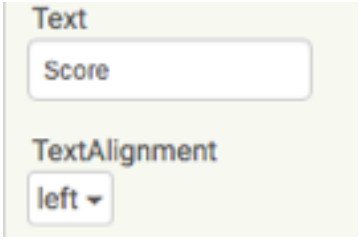
## 4. Add a horizontal arrangement (Component: HorizontalArrangement)

From the left area “Palette”, add a horizontal arrangement (you will find HorizontalArrangement in Layout). This button will allow us to insert two texts inside of it. There are no changes to make to the default parameters.




## 5. Add 2 texts (Component: Label)

From the left area “Palette”, add 2 texts label which you will insert into HorizontalArrangement. In the “text” area, write Score for Label1 and 0 for Label2.

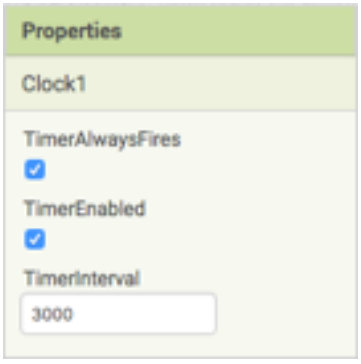



## 6. Add a clickable button (Component: Button)

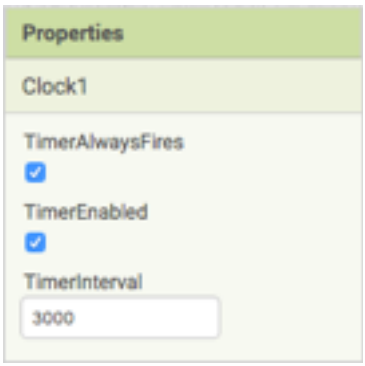
From the left area “Palette: User Interface”, add a clickable button (Button) to your app. Rename it “ResetButton”. In the “text” area, write: Reset. When the user clicks on it, the score will go to 0.


## 7. Add a clock (Component: Clock)

From the left area “Palette”, go to Sensors and add a Clock. In Properties, set the interval to 3000.



Now, your app should have the following components, and look like this:



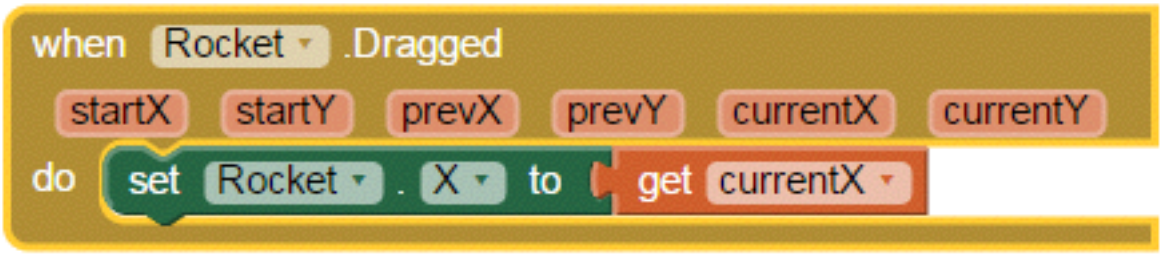


## Part II - Programming

We are now going to program the game. Go to the “Blocks” area.

### Step 1 - Making the rocket move

The first block to create allows you to make your rocket move from right to left by touching it on your screen. Nous allons maintenant programmer le dessin. Rendez-vous dans la partie Blocks.



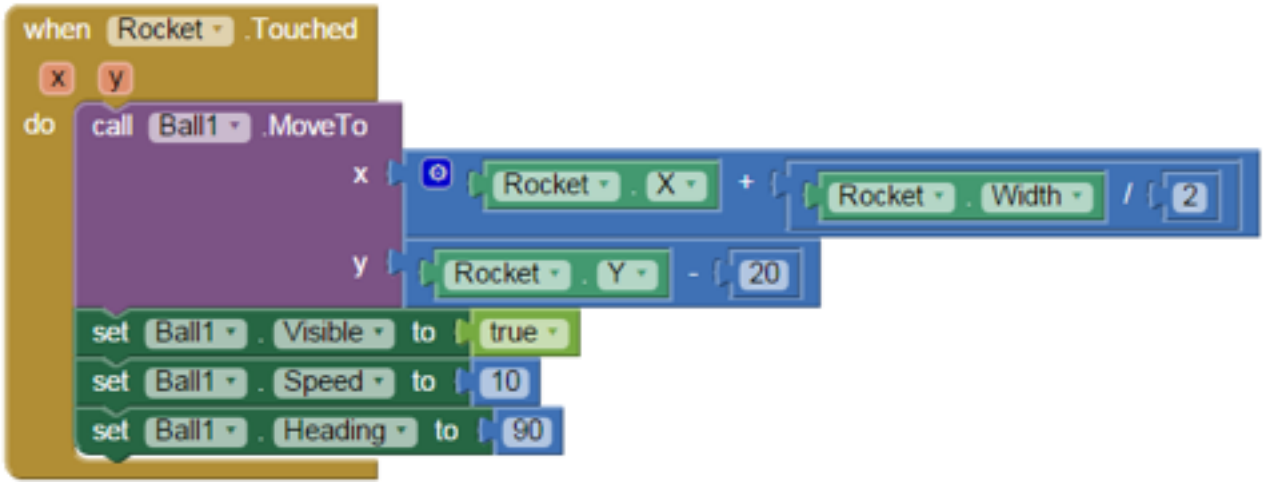

### Step 2 - Programming of the ball

To begin, when you start the game, the ball has to be hidden:

## Step 3 - Hit the alien with the ball

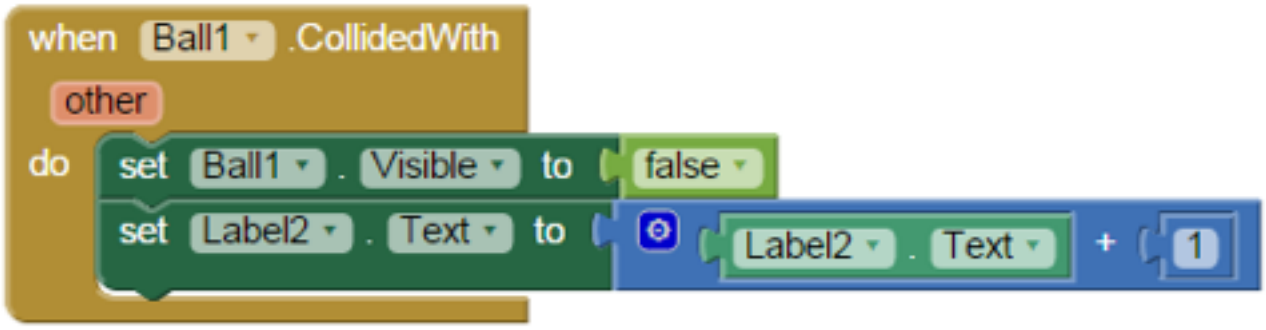
We need to add a block which allows the ball to then come back to the rocket to be thrown again. This variable puts the ball a little bit above the rocket. Here, we move the ball to half of the rocket's width and 20 mm above it.

Then, we will make it so that the rocket throw a ball on the alien. Therefore, we need to make the ball visible and give it an upward trajectory when we throw it:




## Step 4 - Add a score

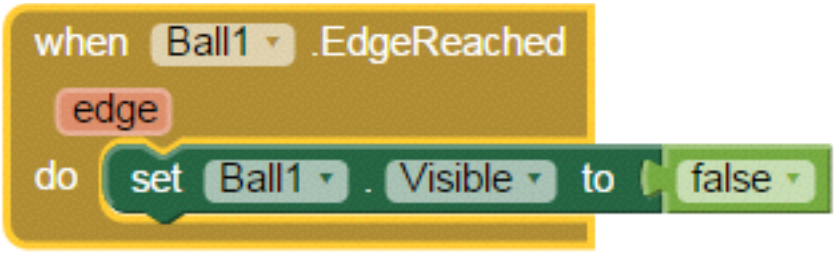
We will make it so that when the ball hits the alien, one point is score. One also needs to add a line of code to make the ball disappear when the alien is hit. Here, "other" is already predefined in the function. It refers to all the elements that can collide with the ball like, in this case, the alien. If there had been other invaders, they would have been encompassed by "other".




Test your program.

## Step 5 - Making the ball disappear

You may have noticed that if you miss the alien, the ball moves to the top of the screen and stays stuck there until you try again. To make the ball disappear when it hits the upper side of the canvas, we will insert the following script:



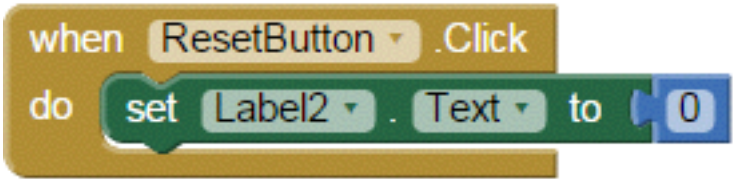

### Step 6 - Changing the alien's position

We are going to make the game a little bit more difficult. Now, when the ball collides with the alien, we will modify the position of the alien. It will keep the same Y-value, we will only change the X to prevent the alien from moving out of the screen. We set it to a random number between the width of the canvas and the width of the alien. Add this last line to the script-block "When Ball1.CollidedWith":


Other difficulty, we are also going to change the alien's position when the timer starts.


### Step 7 - Set the score back to 0

This block will allow us to set the score back to 0 when "reset" is clicked:




## Part III - To go further

Here is a list (of course, not complete) of ideas to make your app better:

- Even more aliens
- Set a countdown
- Add balls
- Give the alien ammunition and make the rocket lose lives if hit
- Create bonus/penalty objects
- Hide some aliens