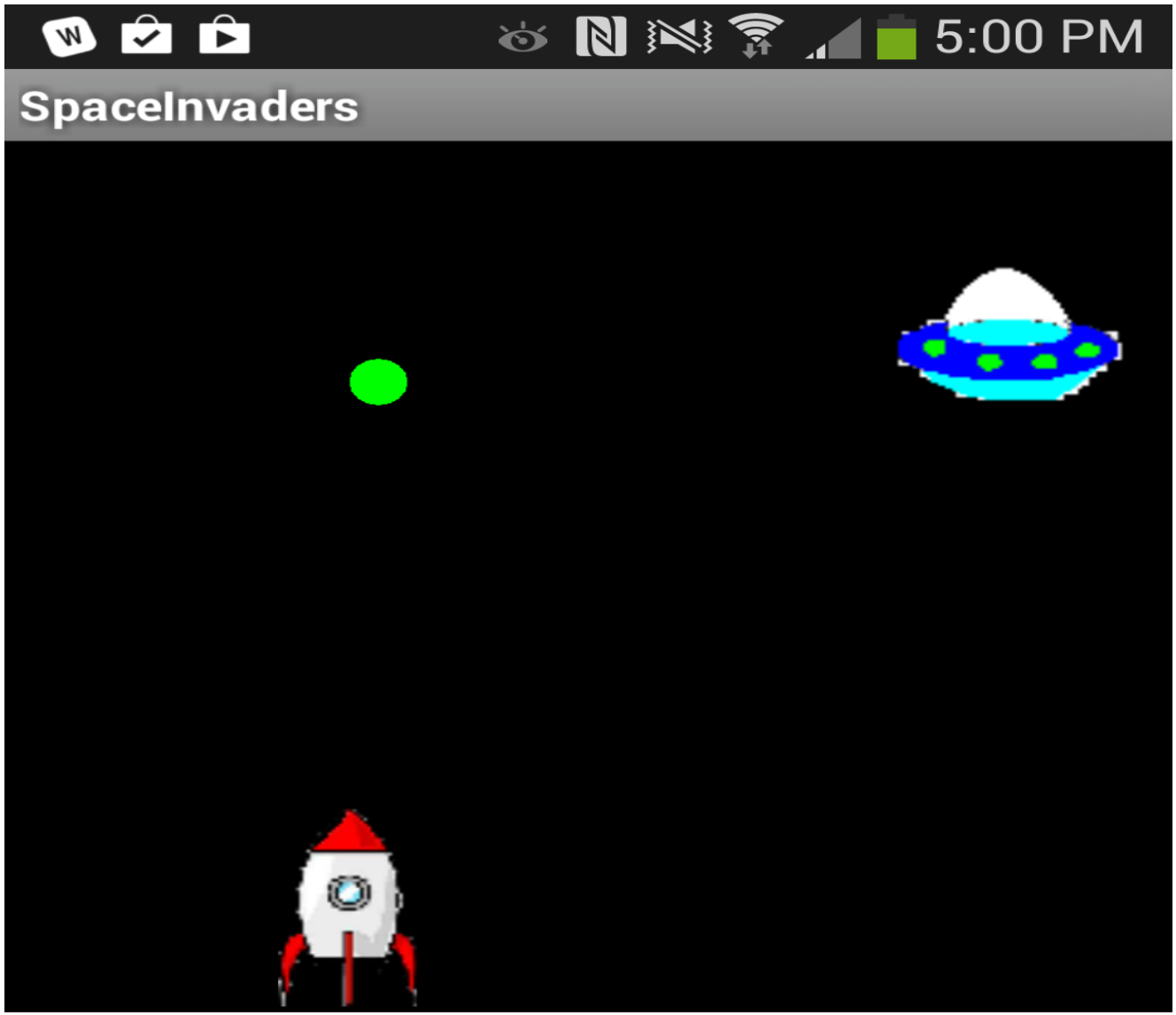
Space Invaders

What You're Building


5:00 PM
SpaceInvaders
Score: 5
Restart

By building the Space Invaders App you will get practice with using Clock components and Timers, using Animation components such as Image Sprites and the Canvas, setting visibility, and detecting collisions in App Inventor. You'll program an application that has a shooter ship whose goal is to shoot all the flying saucers on the screen.

Getting Started

Connect to the App Inventor web site and start a new project. Name it SpaceInvaders, and also set the screen's **Title** to "SpaceInvaders". Connect to a device or emulator.

Introduction

This tutorial introduces the following skills, useful for future game development:

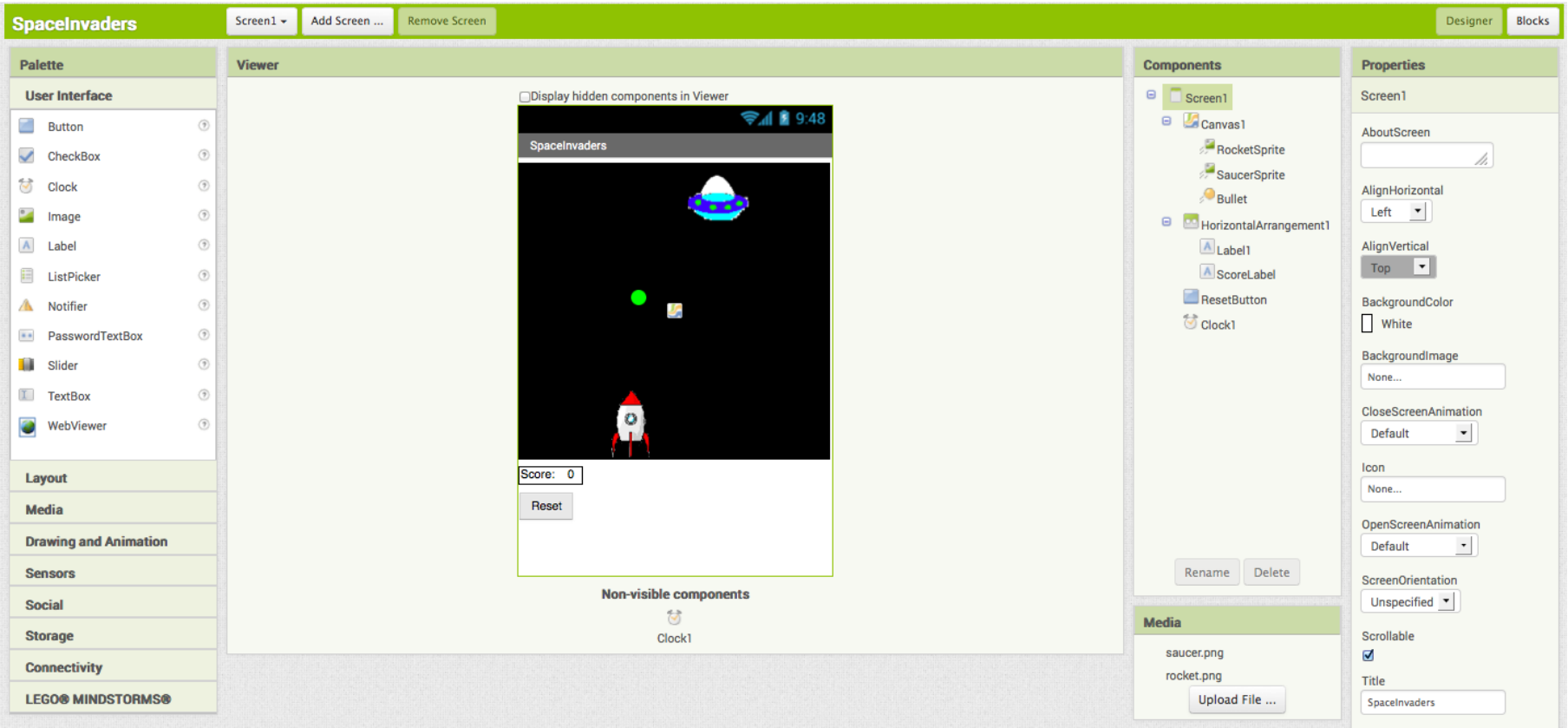
- Using the Clock component
- Using Clock.Timer to move sprites
- Using Sprite.Flung to move a sprite
- Using collision detection
- Setting visibility of sprites

Getting Ready

For this game, you will have two types of sprites: an imagesprite represented by a shooter ship and flying saucers represented by a ball sprite. Click below to download the image files for your rocket ship sprite and flying saucer sprite.

Set up the Components

Use the component designer to create the interface for SpaceInvaders. When you finish, it should look something like the snapshot below (more detailed instructions below the snapshot).



To create this interface, put the following components into the Designer by dragging them from the Component Palette into the Viewer and set the properties of the components as described below:

Component Type	Palette Group	What you'll name it	Purpose of Component	Action
Canvas	Drawing and Animation	Canvas1	The background that we will be putting our sprites on	Change **Width** property to "Fill parent" and **Height** property to 300. Set the **BackgroundColor** property to Black.

ImageSprite	Drawing and Animation	RocketSprite	The rocket ship in our game	Upload the rocketship image and set the **Picture** property to "rocket.png". Set the **Y** property to 230. This will place the rocket at the bottom of the canvas.
ImageSprite	Drawing and Animation	SaucerSprite	The flying saucer in our game	Upload the saucer image and set the **Picture** property to "saucer.png".
BallSprite	Drawing and Animation	Bullet	The bullet from the rocket ship.	Change **PaintColor** to Green and set the **Radius** property to 8.
Clock	User Interface	Clock1	We use the Clock for its Timer method to move the the saucer	Change **TimerInterval** property to 3000.
Horizontal Arrangement	Layout	HorizontalArrangement1	To contain Label1 and ScoreLabel	
Label	User Interface	Label1	To contain the word "Score: "	Change **Text** property to "Score: ".
Label	User Interface	ScoreLabel	To contain the current numerical score	Change **Text** property to "0".
Button	User Interface	ResetButton	To reset the game so the player can play again	Change **Text** property to "Reset".

Now that you have all the essential properties configured, feel free to change the colors of any components that you want to.

Moving the rocket

In this game, the user will move the rocket from side to side. This means we will only be changing the X-direction of the rocket sprite. To do this we will use the RocketSprite.Dragged event handler. When the rocket is dragged, we will adjust it's X property to be the currentX that we dragged the sprite to.

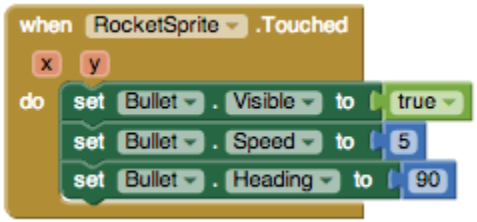
Once you put these blocks together, connect your phone and test this feature out!

Programming the Bullet's Behavior

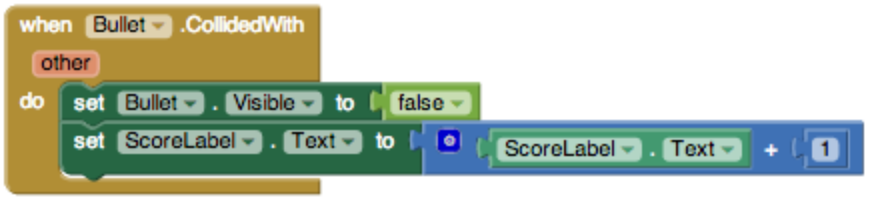
There are several features we want our bullet to have in this game. We want it to shoot from the rocket, collide with the saucer, and be invisible after the collision and before being shot.

Let's start by using the Screen1.initialize block. When the screen is initialized, we will program the bullet to be invisible. We do this by setting the bullet's visibility property to False.

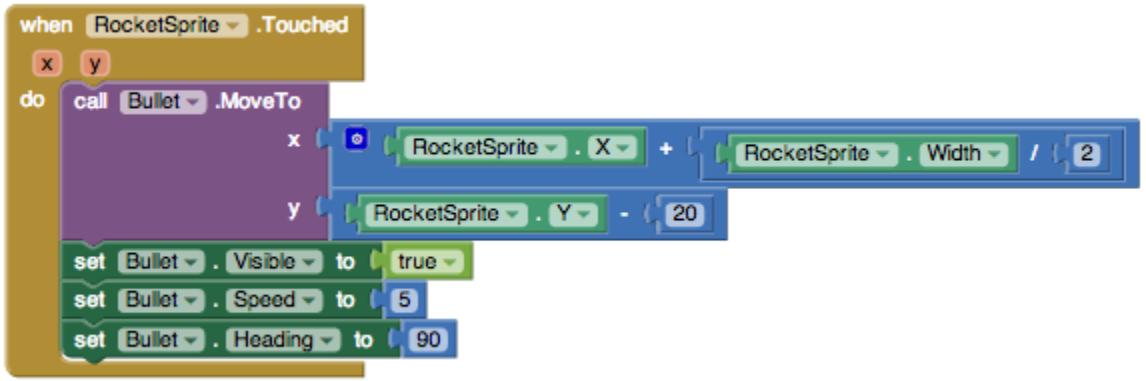
Next, we want to make sure that the bullet appears again when we shoot from the rocket. When we touch the rocket, we want the bullet to start heading towards the saucer. We will do this by using the RocketSprite.Touched event handler. When the rocket is touched, we not only want to set the rocket to be visible, but we also want to set the speed and heading of the rocket. Heading is a value from 0 to 360 that indicates what direction the sprite should be moving towards. 0/360 is to the left, 90 is up, 180 is right, and 270 is down. The speed is measured in pixels/sec.



The last thing we need to program is what happens when the bullet hits the saucer. We will use the Bullet.CollidedWith event handler. This event is called whenever the bullet collides with another sprite. Since our rocket sprite is locked into a Y at the bottom of the screen, the bullet will never collide with the rocket and only with the saucer. On collision we want two things to happen. 1. The score should increase by 1. 2. The bullet should become invisible.



If you have started testing this game out, you may have noticed that once you shoot the bullet, it doesn't appear to let you shoot it again. We need to program the bullet to return to the place in front of the rocket when we shoot it. We can do this using the Bullet.MoveTo block.



Now, test it out!

You may have noticed that if you miss the saucer, the bullet moves to the top of the screen and gets stuck there until you try shooting again. To make the bullet disappear when it hits the top edge of our canvas, we need to use the Bullet.EdgeReached:

Programming the Reset Button

Sometimes, users might want to restart the game and reset their score. When this happens, we need to set the score back to 0.

Increasing the Difficulty -- Changing the Position of the Saucer

Let's make the game a little more challenging! Now, when the bullet collides with the saucer, let's change the location of the saucer. The saucer will keep the same Y value so we'll only have to change the X. We can do this by using the random block.

To make it even more difficult, we'll also change the position of the saucer when the Timer goes off.

Complete Program

Here's the complete **SpaceInvaders** program.