

# Hope IT: Games for Smart Phones

Stars - Sept/Oct 2024

Basic ideas:

- 1) Computers do what we tell them to do
- 2) You can make apps...games

Week 1:

- Welcome
- Introductions to everyone in the room
- Opening Prayer
  
- Overview
  - Make games...they are fun to make
  - Learn about computers, phones, and programming.
  - Realize you can do it.
- Rules/orientation: Can walk around as you wish/restrooms/stay where we can all see you.

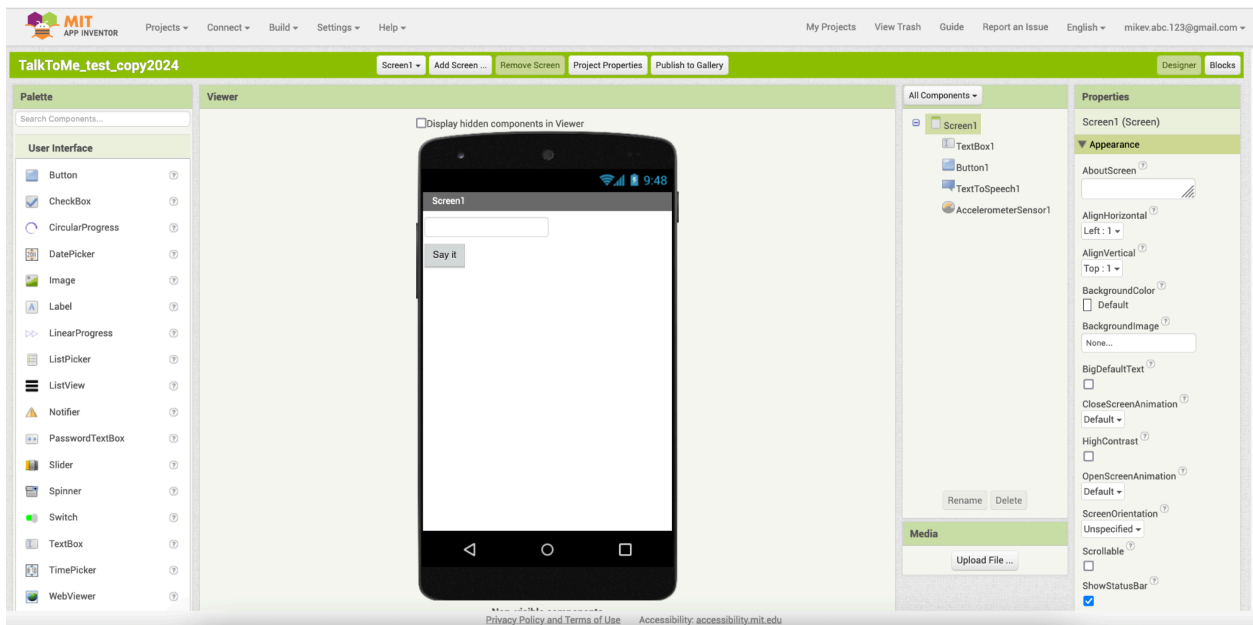
Objectives:

- 1) Learn what phones can do
  - 2) Google Accounts and Security
  - 3) Install AppInventor Companion app on your phone
  - 2) Make your Phone talk
  - 3) Learn some concepts of programming
    - a) Components/Objects:
      - i) Properties, such as Name and Label
      - ii) Events: Click and Shaking
    - b) Blocks as programming code: Instructions for your phone to follow
  - 4) Save your work frequently
  - 5) Encountering challenges: Keep trying...don't give up
- Get into AppInventor: <http://appinventor.mit.edu/>
  - Possibly setup with Google accounts: (Not so exciting, but need to get thru this dry stuff quickly)

- Create a Google account (and remember your password!)
  - *Note: We found Child accounts under 13 do not work in App Inventor.*
- Make sure your Android phone has WiFi turned on
- Install **MIT App Inventor 2** (AI Companion) on your Smart Phone from Play Store

● **SecurityNote: Let's talk about Security, when to trust/not trust QR codes, and think about installing apps. What is Phishing....**

● AppInventor: Introduction- Designer



● AppInventor: Blocks - what does it mean?

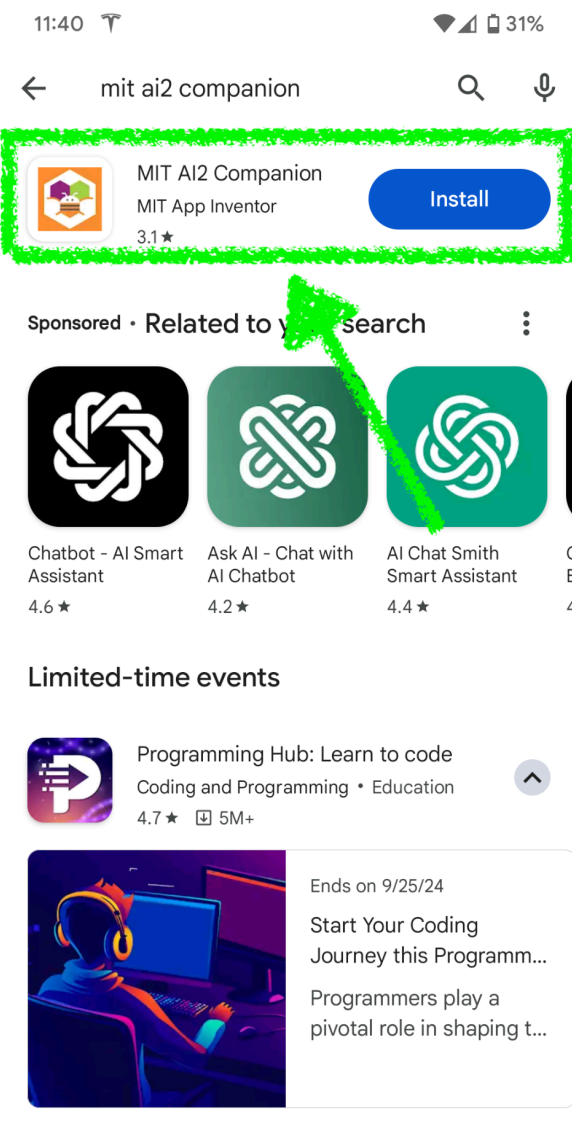
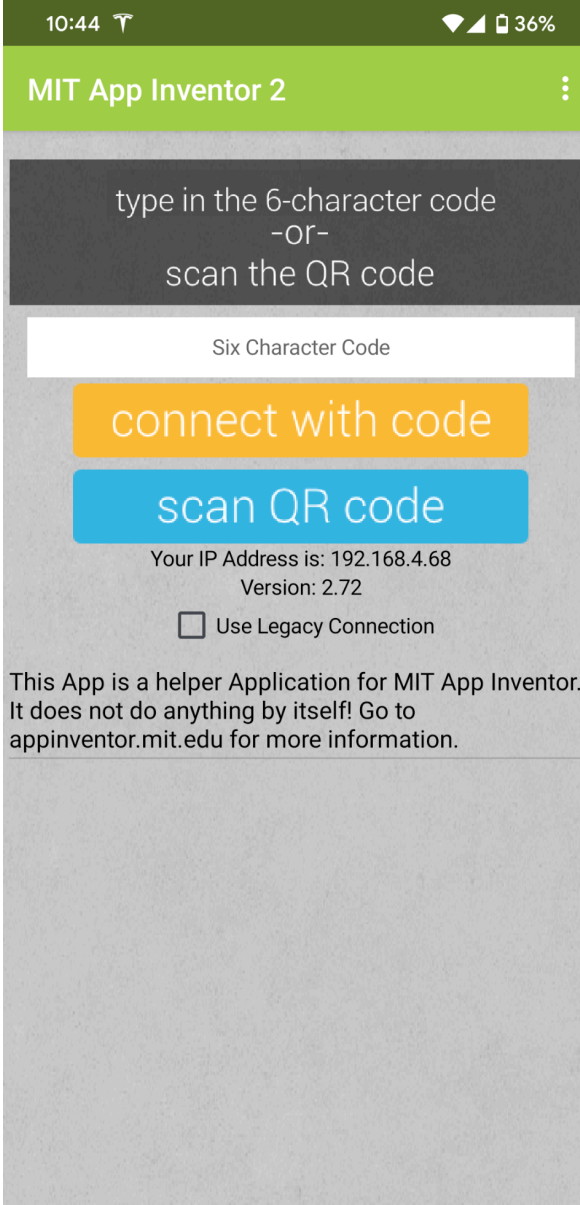
```

when Button1 .Click
do call TextToSpeech1 .Speak
  message TextBox1 . Text
  
```

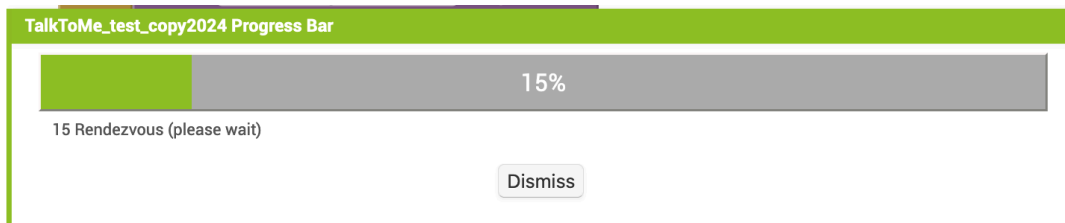
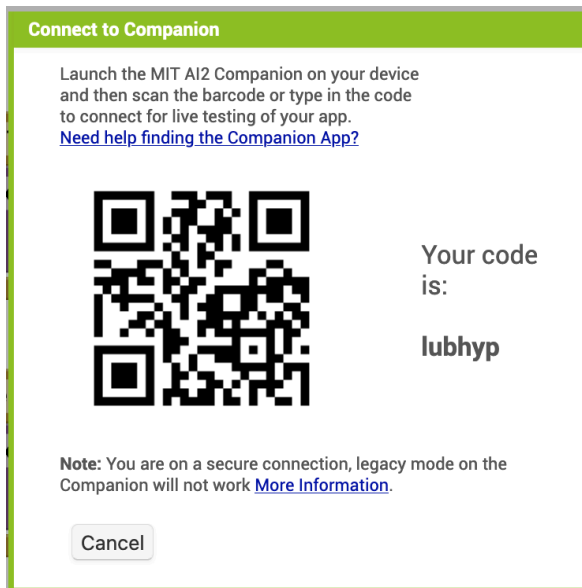
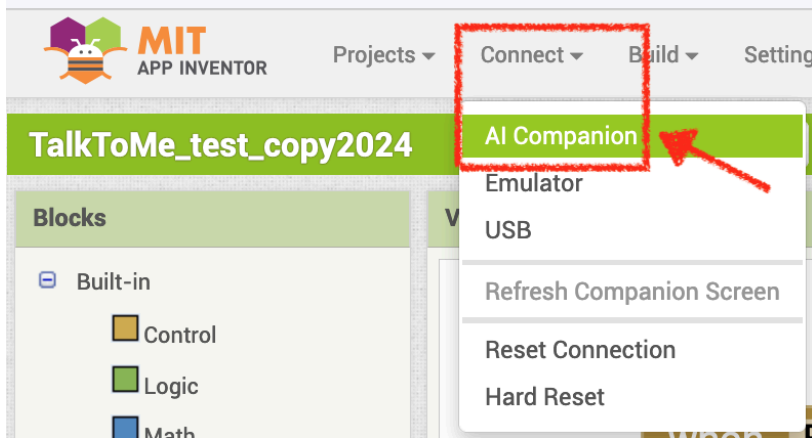
```

when AccelerometerSensor1 .Shaking
do call TextToSpeech1 .Speak
  message "Please stop shaking me. I'm going crazy."
  
```

\* Install **MIT App Inventor 2** (AI Companion) on your Smart Phone from Play Store, called “MIT AI2 Companion”. You can also search by “MIT App Inventor”.

Installing the MIT AI2 Companion	What the app looks like when opened
 <p>The screenshot shows the Google Play Store search results for "mit ai2 companion". The top result is "MIT AI2 Companion" by MIT App Inventor, with a 3.1 star rating and an "Install" button. A green dashed box highlights this result. Below it, there are sponsored and related apps: "Chatbot - AI Smart Assistant" (4.6 stars), "Ask AI - Chat with AI Chatbot" (4.2 stars), and "AI Chat Smith Smart Assistant" (4.4 stars). A green arrow points from the "AI Chat Smith" app icon to the "MIT AI2 Companion" app icon. At the bottom, there is a "Limited-time events" section featuring "Programming Hub: Learn to code" (4.7 stars, 5M+ downloads) and an event titled "Start Your Coding Journey this Programm..." ending on 9/25/24.</p>	 <p>The screenshot shows the MIT App Inventor 2 app interface. The title bar is green with the text "MIT App Inventor 2". Below the title bar, there is a dark grey area with the text "type in the 6-character code -or- scan the QR code". Underneath, there is a white input field labeled "Six Character Code". Below the input field, there are two buttons: "connect with code" (orange) and "scan QR code" (blue). Below the buttons, the text "Your IP Address is: 192.168.4.68" and "Version: 2.72" is displayed. There is a checkbox labeled "Use Legacy Connection" which is currently unchecked. At the bottom, there is a grey area with the text "This App is a helper Application for MIT App Inventor. It does not do anything by itself! Go to appinventor.mit.edu for more information."</p>

- Blocks: Let's build it ourselves
  - Add the components:
    - Button
    - Text
    - TextToSpeech
  - Change a few of the components properties
    - Button's Label: "Say it"
  - Create the blocks....to make the phone speak the text given.
  - Connect to AI Companion app on your phone, via the QR code.



- Wrap- up: Any questions?
- Review Objectives

Reflection:

<https://www.gotquestions.org/seven-I-AM-statements.html>

### **John 6:25-35**

25 When they found him on the other side of the sea, they said to him, “Rabbi, when did you come here?” 26 Jesus answered them, “Truly, truly, I say to you, you seek me, not because you saw signs, but because you ate your fill of the loaves. 27 Do not labor for the food which perishes, but for the food which endures to eternal life, which the Son of man will give to you; for on him has God the Father set his seal.” 28 Then they said to him, “What must we do, to be doing the works of God?” 29 Jesus answered them, “This is the work of God, that you believe in him whom he has sent.” 30 So they said to him, “Then what sign do you do, that we may see, and believe you? What work do you perform? 31 Our fathers ate the manna in the wilderness; as it is written, ‘He gave them bread from heaven to eat.’ ” 32 Jesus then said to them, “Truly, truly, I say to you, it was not Moses who gave you the bread from heaven; my Father gives you the true bread from heaven. 33 For the bread of God is that which comes down from heaven, and gives life to the world.” 34 They said to him, “Lord, give us this bread always.” 35 Jesus said to them, “**I am the bread of life**; he who comes to me shall not hunger, and he who believes in me shall never thirst.

## Week 2:

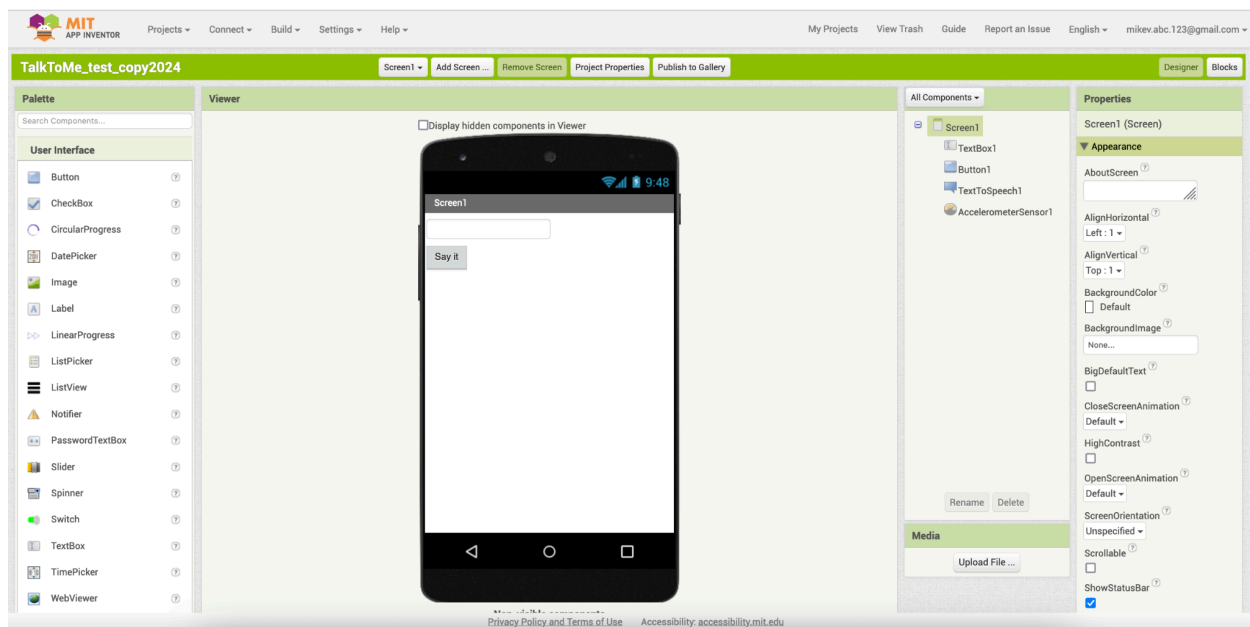
- Welcome
- Opening Prayer
  
- Overview
  - Make games...they are fun to make
  - Lean a lot computers, phones, and programming.
  - Realize you can do it.
- Any questions before we begin?

## Objectives:

- 1) Review what we covered last week
- 2) Add the Accelerometer to our “Talk to Me” Project
  
- 3) Learn about the AppInventor Gallery: Share Code
- 4) Start a new Project: our Marble game
- 5) X-Y grid
- 6) Pitch & Roll
- 7) Save your work frequently

Open App Inventor:

<http://appinventor.mit.edu/>



```
when Button1 .Click
do call TextToSpeech1 .Speak
    message TextBox1 . Text
```

```
when AccelerometerSensor1 .Shaking
do call TextToSpeech1 .Speak
    message "Please stop shaking me. I'm going crazy."
```

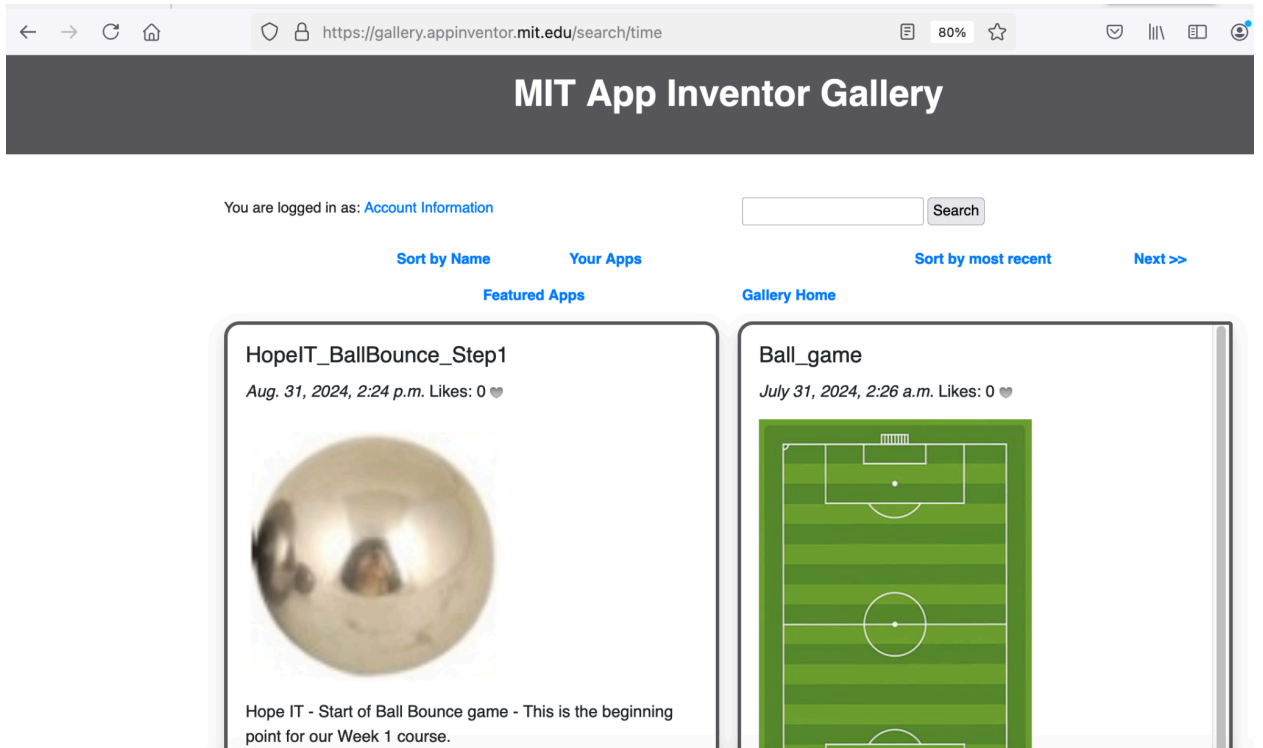
- 1) Let's do a warm-up: "Talk To Me" project
  - a) Accelerometer Sensor
    - i) Shaking Event
  - b) Add text
  - c) Run App on Phone using our AICompanion/QRCode



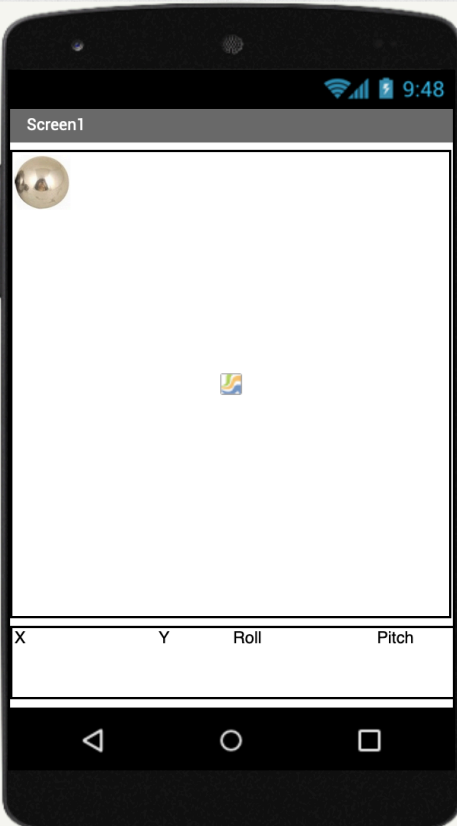
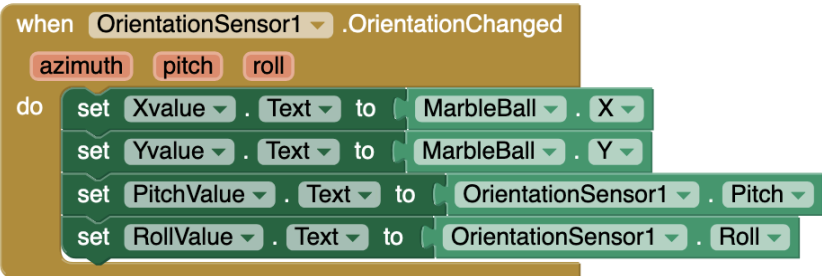
2) Let's start our new project: BallBounce

Let's go to the AppInventor Gallery: <https://gallery.appinventor.mit.edu/featured/>

- Let's get a project: **HopeIT\_BallBounce\_Step1**
- Search for "Hope IT Ball Bounce"
- (Or got the Hope IT web page: <https://hopeit.net/games-on-the-android-phone/>)



- Run App on Phone
- Notice the Roll and Pitch (use a small airplane to demonstrate Roll & Pitch)

Designer	Block
 <p>The Designer view shows a mobile application interface. At the top, the status bar displays 'Screen1', signal strength, Wi-Fi, battery, and the time '9:48'. The main content area features a whiteboard with a marble in the top-left corner. Below the whiteboard, there are four labels: 'X', 'Y', 'Roll', and 'Pitch'. The bottom of the screen shows the standard Android navigation bar with back, home, and recent apps buttons.</p>	 <pre> when OrientationSensor1 .OrientationChanged   azimuth pitch roll do   set Xvalue . Text to MarbleBall . X   set Yvalue . Text to MarbleBall . Y   set PitchValue . Text to OrientationSensor1 . Pitch   set RollValue . Text to OrientationSensor1 . Roll </pre> <p>The Block view displays a Scratch-style script. It starts with a 'when OrientationSensor1 .OrientationChanged' event block. Below it are three 'azimuth', 'pitch', and 'roll' blocks. A 'do' block contains four 'set' blocks: 'set Xvalue . Text to MarbleBall . X', 'set Yvalue . Text to MarbleBall . Y', 'set PitchValue . Text to OrientationSensor1 . Pitch', and 'set RollValue . Text to OrientationSensor1 . Roll'.</p>

- Let's make the marble roll: Everytime the OrientationSensor changes, we make the X and Y increase by 1 (one).
  - We drew the X and Y coordinates on a white board so the kids can see why the marble is going in a diagonal. This is exactly what we told the app to do!
  - That's nice, but we really want it to move back and forth.
  
- What can we use to make that occur: well, Roll and Pitch!
  - Only one problem: Why is it going the opposite direction?
  - Ask the group how can we solve the problem. Notice the X and Y and Roll and Pitch values at the bottom of the app. How can we use math to solve our problem?
  - We spent some time allowing the kids to think this thru. We highlight how important math is. The answer: multiple Roll and Pitch by -1.

```
when OrientationSensor1 .OrientationChanged
  azimuth pitch roll
do
  set Xvalue . Text to MarbleBall . X
  set Yvalue . Text to MarbleBall . Y
  set PitchValue . Text to OrientationSensor1 . Pitch
  set RollValue . Text to OrientationSensor1 . Roll
  set MarbleBall . X to MarbleBall . X + OrientationSensor1 . Roll × -1
  set MarbleBall . Y to MarbleBall . Y + OrientationSensor1 . Pitch × -1
```

- Wrap- up: Any questions?
- Review Objectives

## Reflection:

### **John 8:12-20**

<sup>12</sup> Again Jesus spoke to them, saying, “**I am the light of the world**; he who follows me will not walk in darkness, but will have the light of life.” <sup>13</sup> The Pharisees then said to him, “You are bearing witness to yourself; your testimony is not true.” <sup>14</sup> Jesus answered, “Even if I do bear witness to myself, my testimony is true, for I know whence I have come and whither I am going, but you do not know whence I come or whither I am going. <sup>15</sup> You judge according to the flesh, I judge no one. <sup>16</sup> Yet even if I do judge, my judgment is true, for it is not I alone that judge, but I and he<sup>[b]</sup> who sent me. <sup>17</sup> In your law it is written that the testimony of two men is true; <sup>18</sup> I bear witness to myself, and the Father who sent me bears witness to me.” <sup>19</sup> They said to him therefore, “Where is your Father?” Jesus answered, “You know neither me nor my Father; if you knew me, you would know my Father also.” <sup>20</sup> These words he spoke in the treasury, as he taught in the temple; but no one arrested him, because his hour had not yet come.

## Reflections:

- Before/After - Leaders trying accuse a woman of adultery; Jesus let's her go
- John 9 - Jesus heals a blind man.
- Really hard to walk in the dark

## Week 3:

**Idea:** Do we have starter projects, so kids that missed, or didn't quite finish, can catch up?

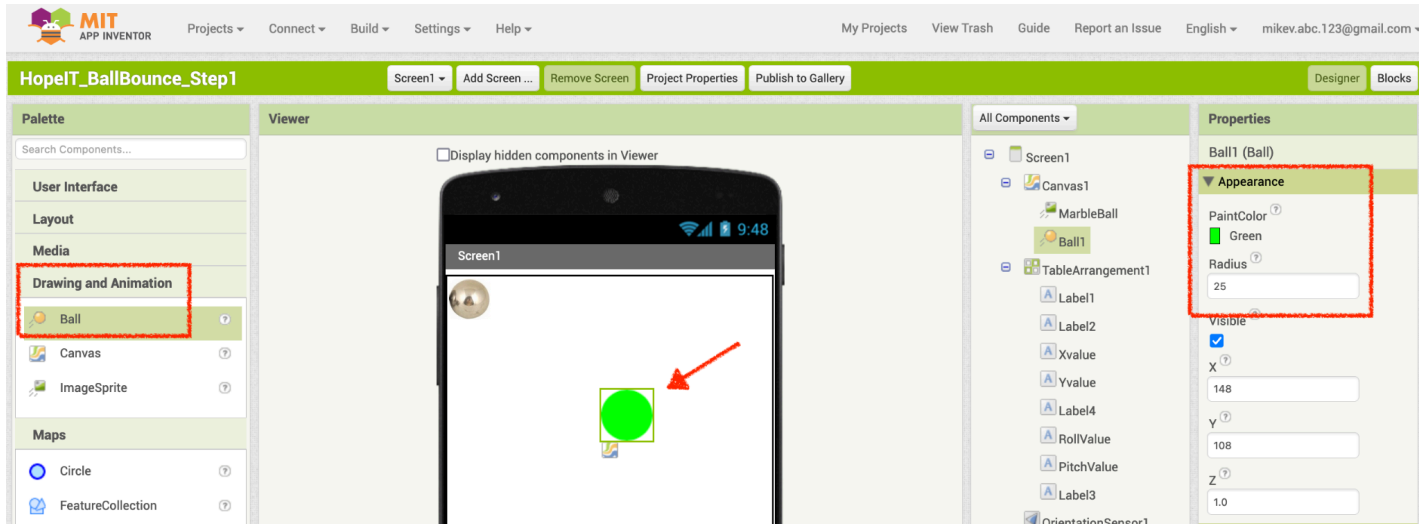
- Warm-up #2: Sensor - Phone turns red or green depending if something close to it
  
- Welcome
- Opening Prayer
  
- Overview
  - Make games...they are fun to make
  - Learn a lot computers, phones, and programming.
  - Realize you can do it.
- Any questions before we begin?

## Objectives:

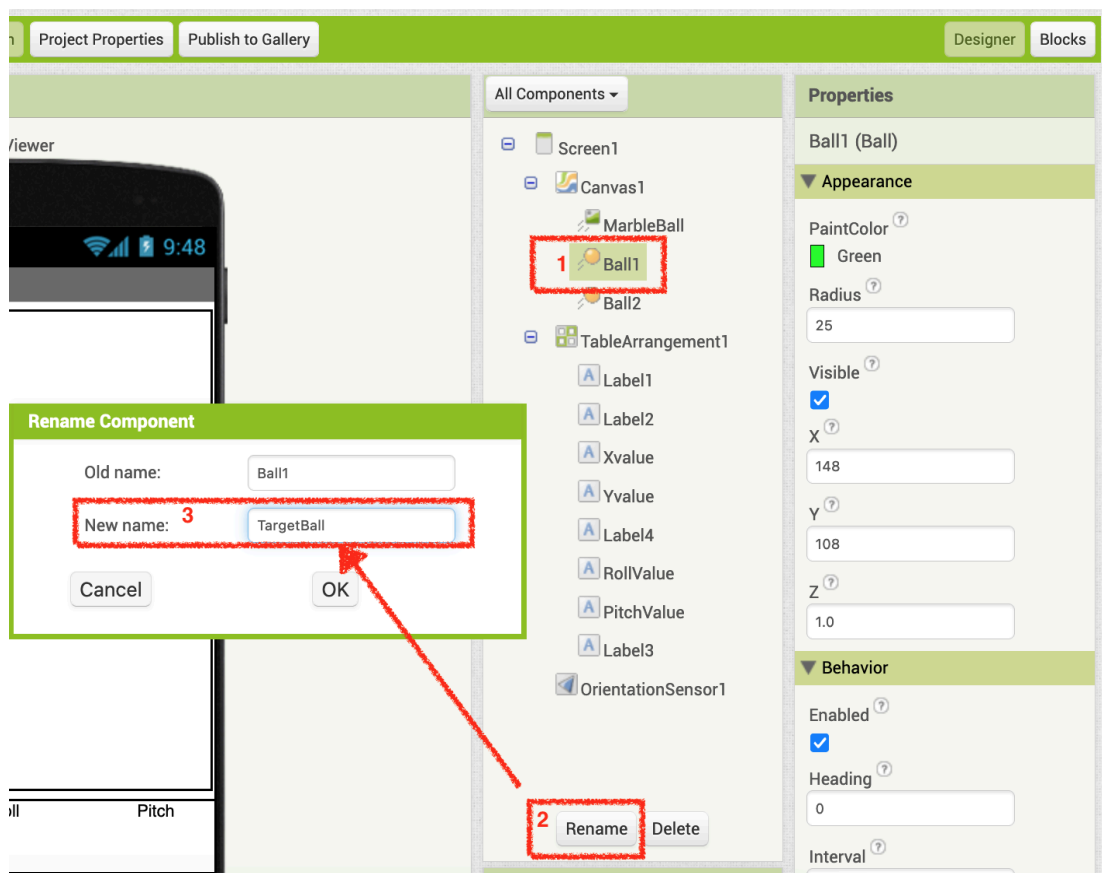
- 1) New Warmup project: "GreenRed Sensor": Learn about the Proximity Sensor
- 2) Review our BallBounce game
- 3) Add more Components/Objects
  - a) 2 Drawing "Ball":
  - b) Yes, some more math: Radius of a circle
- 4) Events: Collisions
- 5) IF-THEN-ELSE statements
- 6) Save your work frequently

Let's add the "Ball":

- 1) In Desinger:
  - a) Drag Drawing "Ball" Component/Object, twice...to have 2 Balls.
  - b) Change PaintColor Property to Green. Make the other Ball Grey.
  - c) Change both Ball's Radio to "25": (Review what a Radius means for a Circle)

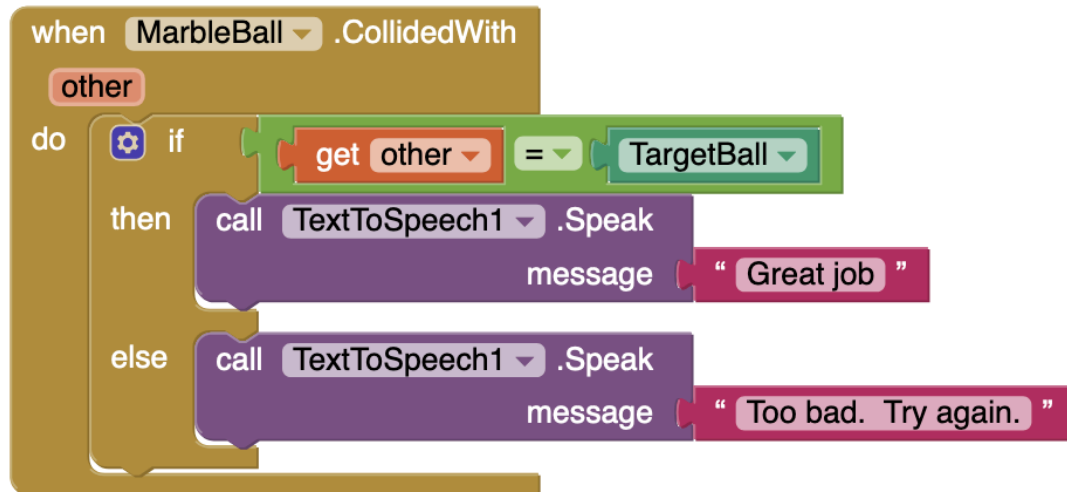


Let's rename this Ball, as now "TargetBall":



Add the "TextToSpeech" Component, like we did for the "TalkToMe" project.

In the Blocks screen, let's make something happen when the MarbleBall collides with the TargetBall:



- Wrap- up: Any questions?
- Review Objectives

## Reflection:

### **John 10:1-10**

“Truly, truly, I say to you, he who does not enter the sheepfold by the door but climbs in by another way, that man is a thief and a robber; <sup>2</sup> but he who enters by the door is the shepherd of the sheep. <sup>3</sup> To him the gatekeeper opens; the sheep hear his voice, and he calls his own sheep by name and leads them out. <sup>4</sup> When he has brought out all his own, he goes before them, and the sheep follow him, for they know his voice. <sup>5</sup> A stranger they will not follow, but they will flee from him, for they do not know the voice of strangers.” <sup>6</sup> This figure Jesus used with them, but they did not understand what he was saying to them.

<sup>7</sup> So Jesus again said to them, “Truly, truly, I say to you, **I am the door of the sheep.** <sup>8</sup> All who came before me are thieves and robbers; but the sheep did not heed them. <sup>9</sup> **I am the door**; if any one enters by me, he will be saved, and will go in and out and find pasture. <sup>10</sup> The thief comes only to steal and kill and destroy; I came that they may have life, and have it abundantly.

Reflections:









## Week 4:

### Ideas:

- 1) Reset game w/ Timer
  - 2) Add Lists of Responses and Randomly play them
  - 3) Publish projects
- Welcome
  - Opening Prayer
  
  - Overview
    - Make games...they are fun to make
    - Learn a lot computers, phones, and programming.
    - Realize you can do it.
  - Any questions before we begin?

### Objectives:

- 1) Learn what phones can do
- 2) Learn more concepts of programming
- 3) More Objects: Ball, Timer
- 4) Properties: Visible, PaintColor, TimerEnabled
- 5) Events: Collisions, Timer
- 6) Programming Concepts:
  - a) IF statement
  - b) Intro to Lists
  - c) Random
- 7) Repetition
- 8) Publish your work
  - a) Share your project: AIA file
  - b) Run your project: APK file

```
when Clock1 .Timer
do
  set Ball2 . PaintColor to [green]
  set Ball1 . Visible to true
  set ImageSprite1 . Visible to true
  set Clock1 . TimerEnabled to false
  set ImageSprite1 . X to 0
  set ImageSprite1 . Y to 0
```

```
when ImageSprite1 .CollidedWith
  other
do
  if
  then
    set Ball2 . PaintColor to [magenta]
    set Ball1 . Visible to false
    set ImageSprite1 . Visible to false
    set Clock1 . TimerEnabled to true
    call TextToSpeech1 .Speak
      message pick a random item list
      make a list
      " Good going "
      " Great job "
      " Right on "
      " You got this "
      " That was easy "
      " Lets play again "
  else if
  then
    set ImageSprite1 . Visible to false
    set Clock1 . TimerEnabled to true
    call TextToSpeech1 .Speak
      message pick a random item list
      make a list
      " Better luck next time "
      " Try again "
      " Whoops "
    set Ball1 . X to 100
    set Ball1 . Y to 100
    set Ball3 . X to 50
    set Ball3 . Y to 200
    set Ball4 . X to 200
```

### **Publish your app to your phone:**

- And this should work on your friends' Android phones.

*Note: This doesn't work out of the box for iPhones. You have to apply with Apple to have a Developer's License, see the link below.*

<https://iosbuildservertest.appinventor.mit.edu/reference/other/build-ios-apps.html>

- Wrap- up: Any questions?
- Review Objectives

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### **Reflection:**

John 10:11-15

<sup>11</sup> **I am the good shepherd.** The good shepherd lays down his life for the sheep. <sup>12</sup> He who is a hireling and not a shepherd, whose own the sheep are not, sees the wolf coming and leaves the sheep and flees; and the wolf snatches them and scatters them. <sup>13</sup> He flees because he is a hireling and cares nothing for the sheep. <sup>14</sup> **I am the good shepherd;** I know my own and my own know me, <sup>15</sup> as the Father knows me and I know the Father; and I lay down my life for the sheep.

### Reflections

- Psalm 23
- Protecting sheep to the point of personal sacrifice



## Week 5:

- Welcome
- Opening Prayer
- Overview
  - Make games...they are fun to make
  - Learn a lot computers, phones, and programming.
  - Realize you can do it.
- Any questions before we begin?

## Objectives:

- 1) Add more “Red” balls - make them move randomly
- 2) Review Memory in a computer





- Wrap- up: Any questions?
- Review Objectives

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## Reflection:

### John 11:17-27

<sup>17</sup> Now when Jesus came, he found that Laz'arus<sup>[a]</sup> had already been in the tomb four days. <sup>18</sup> Bethany was near Jerusalem, about two miles<sup>[b]</sup> off, <sup>19</sup> and many of the Jews had come to Martha and Mary to console them concerning their brother. <sup>20</sup> When Martha heard that Jesus was coming, she went and met him, while Mary sat in the house. <sup>21</sup> Martha said to Jesus, "Lord, if you had been here, my brother would not have died. <sup>22</sup> And even now I know that whatever you ask from God, God will give you." <sup>23</sup> Jesus said to her, "Your brother will rise again." <sup>24</sup> Martha said to him, "I know that he will rise again in the resurrection at the last day." <sup>25</sup> Jesus said to her, "**I am the resurrection and the life**,<sup>[c]</sup> he who believes in me, though he die, yet shall he live, <sup>26</sup> and whoever lives and believes in me shall never die. Do you believe this?" <sup>27</sup> She said to him, "Yes, Lord; I believe that you are the Christ, the Son of God, he who is coming into the world."



## Week 6:

### Ideas:

- Warm up #4 : MapSample
  - Wrap up BallBounce game
    - How to make this better?
  - How to learn more
- 
- Welcome
  - Opening Prayer
  
  - Overview
    - Make games...they are fun to make
    - Learn a lot computers, phones, and programming.
    - Realize you can do it.
  - Any questions before we begin?

### Objectives:

- 1) Learn what phones can do
- 2) Review programming concepts:
  - a) Objects: Properties, Methods, and Events
  - b) IF-THEN-ELSE
- 4) Review Sensor objects we covered, and others we haven't covered.
- 5) Re-show the game...this is how we convince the people in the meeting...(George)
- 5) Can change the screen background. Can change the red balls into skulls
- 6) Imagine how to make this better...they pay you to improve this...people can see the effort
- 3) Hope IT Survey
- 4) Certificates
- 5) Hope IT - Review of upcoming courses
- 8) How to keep learning....videos...

Objects	Balls	Button	TextToSpeech	OrientationSens or
Properties	X, Y, Color			Pitch, Roll
Methods			Speak	
Events		Click		Change

- Learn more:
  - Hope IT's web page: <https://hopeit.net/games-on-the-android-phone/>
  - Review Tutorials to learn: <http://appinventor.mit.edu/explore/ai2/tutorials>
  
- Wrap- up: Any questions?
- Review Objectives & Course Objectives
  - Make games...they are fun to make
  - Learn a lot computers, phones, and programming.
  - Realize you can do it.

Reflection:

**John 14:1-7**

“Let not your hearts be troubled; believe <sup>[a]</sup> in God, believe also in me. <sup>2</sup> In my Father’s house are many rooms; if it were not so, would I have told you that I go to prepare a place for you? <sup>3</sup> And when I go and prepare a place for you, I will come again and will take you to myself, that where I am you may be also. <sup>4</sup> And you know the way where I am going.” <sup>[b]</sup> <sup>5</sup> Thomas said to him, “Lord, we do not know where you are going; how can we know the way?” <sup>6</sup> Jesus said to him, “**I am the way, and the truth, and the life**; no one comes to the Father, but by me. <sup>7</sup> If you had known me, you would have known my Father also; henceforth you know him and have seen him.”

Course Notes:

MIT's Git Hub:

<https://github.com/mit-cml>