

Test Average App

In this tutorial, you will create an app that allows the user to enter three test scores and calculates the average of the test scores. If the average is greater than 95, the app also displays a message congratulating the user. Figure 4-16 shows the app's screen in the Viewer, along with the names of the components.

When the app runs, the user enters the three test scores into the `TextBoxScore1`, `TextBoxScore2`, and `TextBoxScore3` components. When the user clicks the `ButtonCalculate` button, the app calculates the average of the three scores and displays the result in the `TextBoxAverageDisplay` component. If the average is greater than 95, the app also changes the `LabelPrompt` component's Text property to Great Job!

The app also has a button named `ButtonStartOver` that clears the `TextBox` components and restores the `LabelPrompt` component's Text property to the value Enter Three Test Scores.

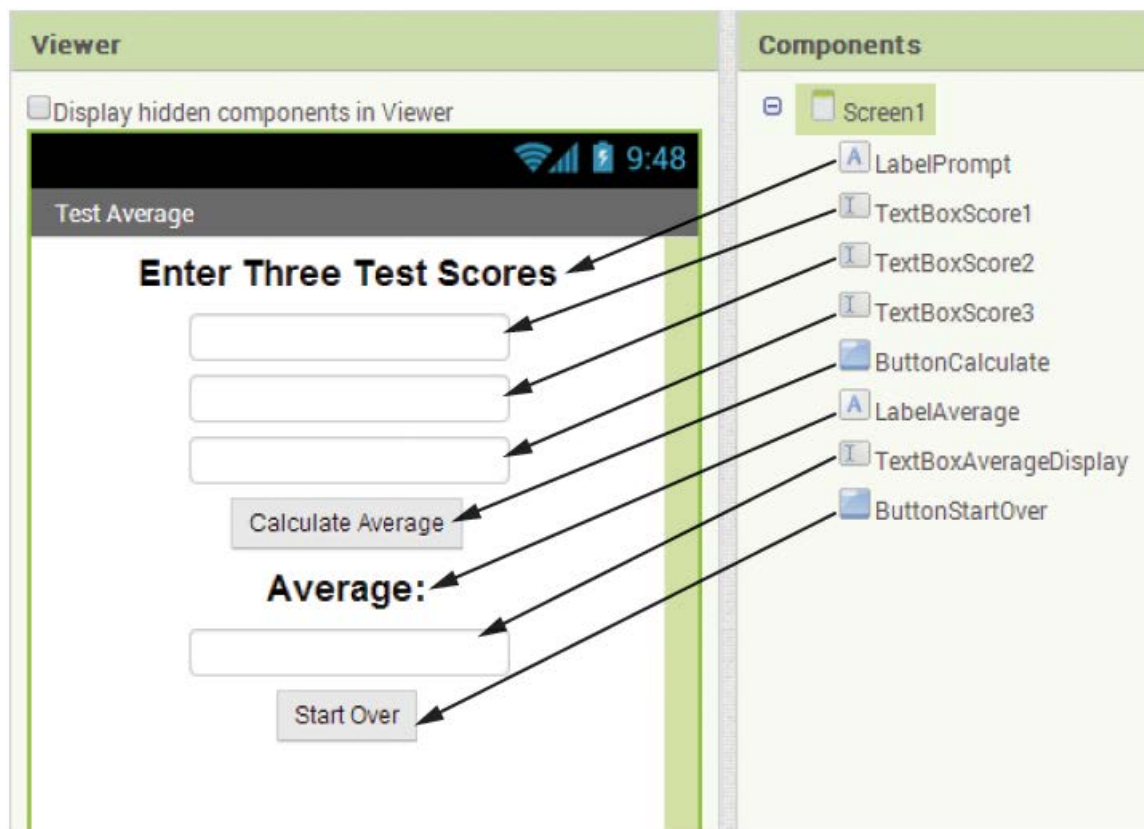


Figure 4-16 The App's User Interface

Step 1: Start a new project named **TestAverage**.

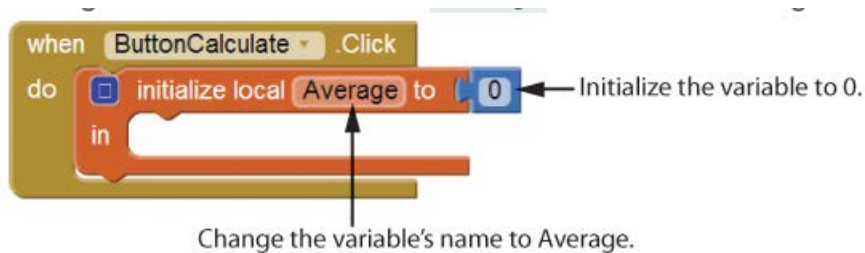
Step 2: Set up the app's screen with the components shown in the Table below for the relevant property settings for each component.

Component	Relevant Property Settings
Screen1	AlignHorizontal = Center Title = Test Average
LabelPrompt	FontBold = checked FontSize = 20 Text = Enter Three Test Scores TextAlignment = Center
TextBoxScore1	Enabled = checked Numbers Only = checked Hint = Enter score 1. Width = Automatic Height = Automatic
TextBoxScore2	Enabled = checked Numbers Only = checked Hint = Enter score 2. Width = Automatic Height = Automatic
TextBoxScore3	Enabled = checked NumbersOnly = checked Hint = Enter score 3. Width = Automatic Height = Automatic
ButtonCalculate	Text = Calculate Average
LabelAverage	FontBold = checked FontSize = 20 Text = Average: TextAlignment = Center
TextBoxAverageDisplay	Enabled = unchecked FontBold = checked FontSize = 20 Hint = cleared TextAlign = Center Width = Automatic Height = Automatic
ButtonStartOver	Text = Start Over

Step 3: Now you will program the blocks for the app. Open the Blocks Editor and create a Click event handler for the **ButtonCalculate** component. When the event handler is complete, it will calculate the average of the three test scores that were entered by the user and assign that value to the average variable. If the average is greater than 95, a special message will be displayed.

Step 4: Now you will create a local variable to hold the average of the test scores. Open the Variables drawer and select the initialize local name to block. This creates an initialization block in the workspace. Plug the initialization block into the **ButtonCalculate.Click** event handler.

Step 5: Change the variable's name to Average and set the average variable's initial value to 0, as shown below.



Step 6: In a different area of the workspace, assemble the blocks shown below. These blocks will calculate the average of the test scores entered by the user. (Note that you will have to use the + operator's mutator bubble to add a third operand to the + operator block.) When you have the blocks assembled, they should appear as shown below.

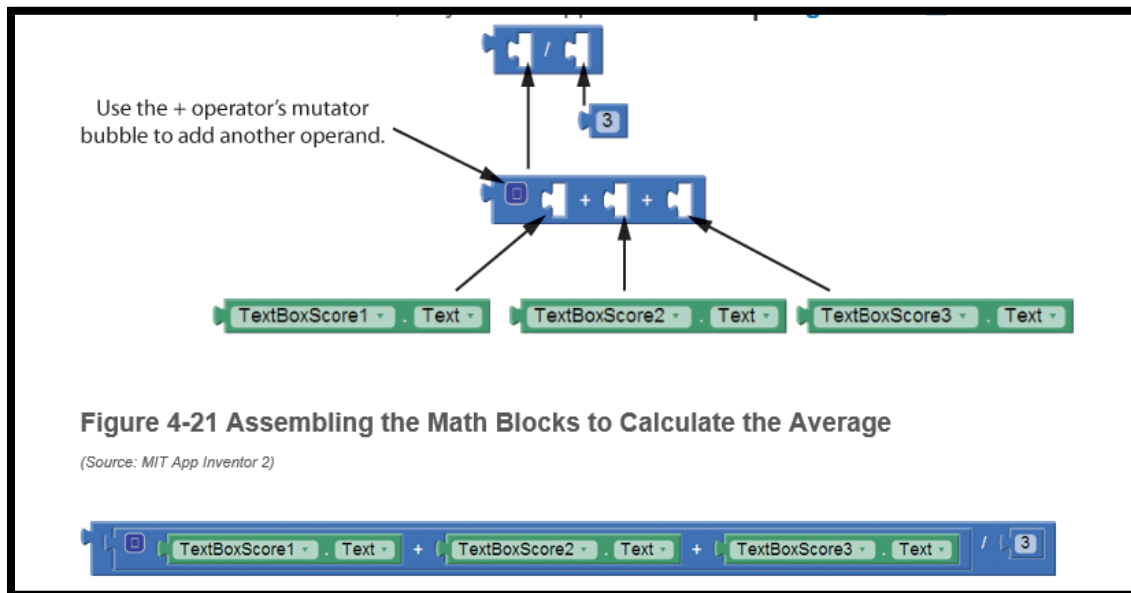


Figure 4-21 Assembling the Math Blocks to Calculate the Average

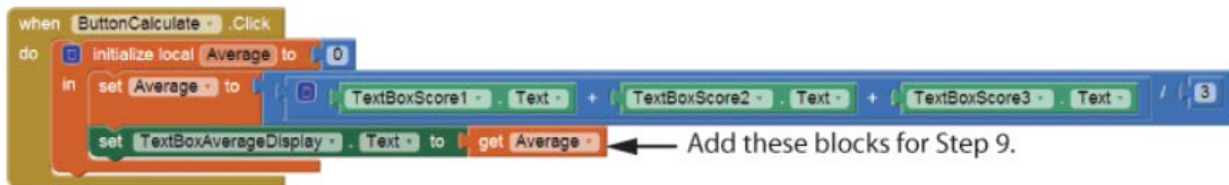
(Source: MIT App Inventor 2)

Step 7: You want to assign the result of the calculation to the Average variable. Open the Variables drawer, select the set block, and plug it into the **ButtonCalculate.Click** event handler. Next, select the Average variable in the set block's dropdown. The block should now appear as shown below.

Step 8: Plug the math blocks for the calculation into the socket of the set Average to block as shown below.



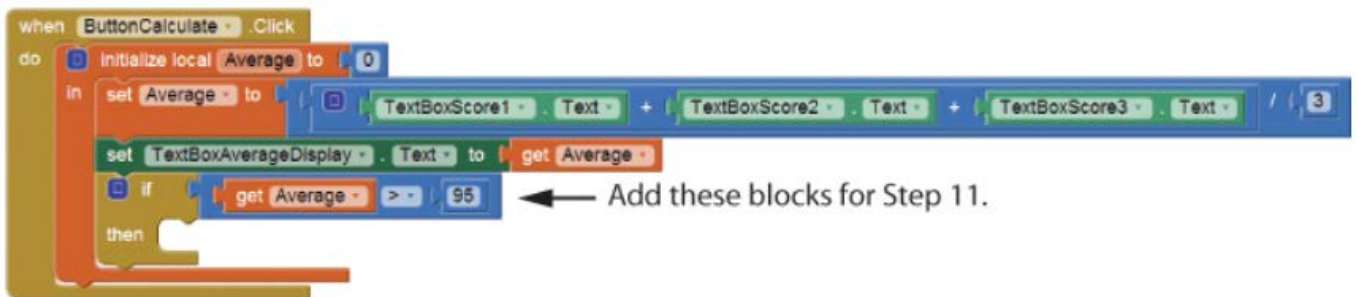
Step 9: Next, the **ButtonCalculate** component should display the average in the **TextBoxAverageDisplay** component as shown below.



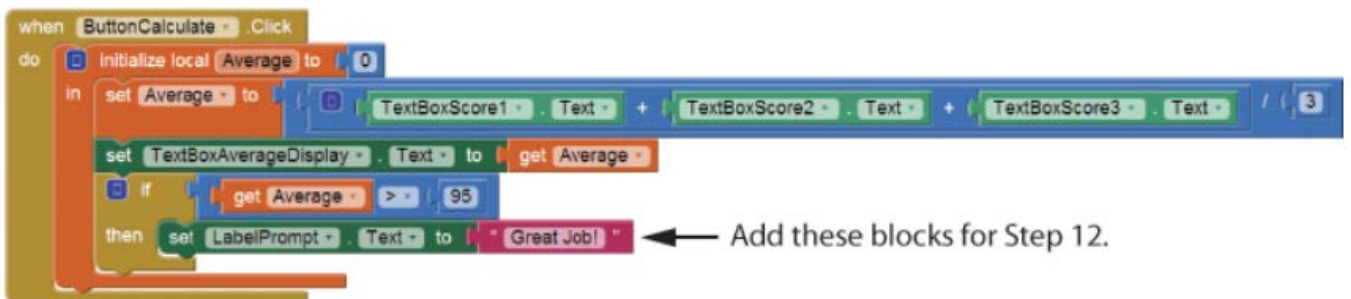
Step 10: Now you will begin assembling the if then block that determines whether the average is greater than 95. Open the Control drawer (in the Built-in section) and select the if then block.

Step 11: Now create the Boolean test expression show below. Here are some hints and reminders:

- To create the > operator block, select the = block in the Math drawer, then use the block's dropdown to change it to a > operator block.
- You will find the get block in the Variables drawer.



Step 12: Complete the if then block as shown below.



Step 13: Now you will create the Click event handler for the **ButtonStartOver** button, as shown below. When this button is clicked, the **TextBox** components will be cleared and the **LabelPrompt** component's Text property will be set to Enter Three Test Scores.

```
when ButtonStartOver .Click
do
  set TextBoxScore1 . Text to ""
  set TextBoxScore2 . Text to ""
  set TextBoxScore3 . Text to ""
  set TextBoxAverageDisplay . Text to ""
  set LabelPrompt . Text to "Enter Three Test Scores"
```

Step 14: Test the app in the emulator or on your device. First, as shown in the image on the left in Figure 4-31, enter the values 70, 75, and 80 as the test scores. Click the Calculate Average button and you should see the average as shown in the figure.

Next, click the Start Over button. The text boxes should clear. Enter the values 100, 99, and 98 as the test scores. Click the Calculate Average button and you should see the average as shown on the left in the figure. You should also see the message Great Job! displayed at the top of the screen.



Figure 4-31 The App Running in the Emulator