CHAPTER 7

Lists

Topics

- Creating a list
- Iterating over a list with the `for each` loop
- Selecting an item
- Inserting and appending items
- Removing items
- Replacing items
- Searching for an item
- Other list operations

Creating a List

- A list is a single object that contains multiple items of related data.
- To create a list, first need to create a *variable*.
- The variable will hold the list of multiple items.
- To create a list by plugging the `make a list` block into the list variable.
- The `make a list` method is located in the *List* drawer.

Figure 7-1 Create a Variable that Holds a List (*Source:* MIT App Inventor 2)

Creating a List

- Next, you can begin adding items to your list.
- To add a text item to your list, drag a text block (from the *Text* drawer).
- Change the value to the data that you wish to add and plug it in.

Figure 7-2 Add a Text Item to a List (*Source:* MIT App Inventor 2)

Creating a List

There are two steps to make your list visible.

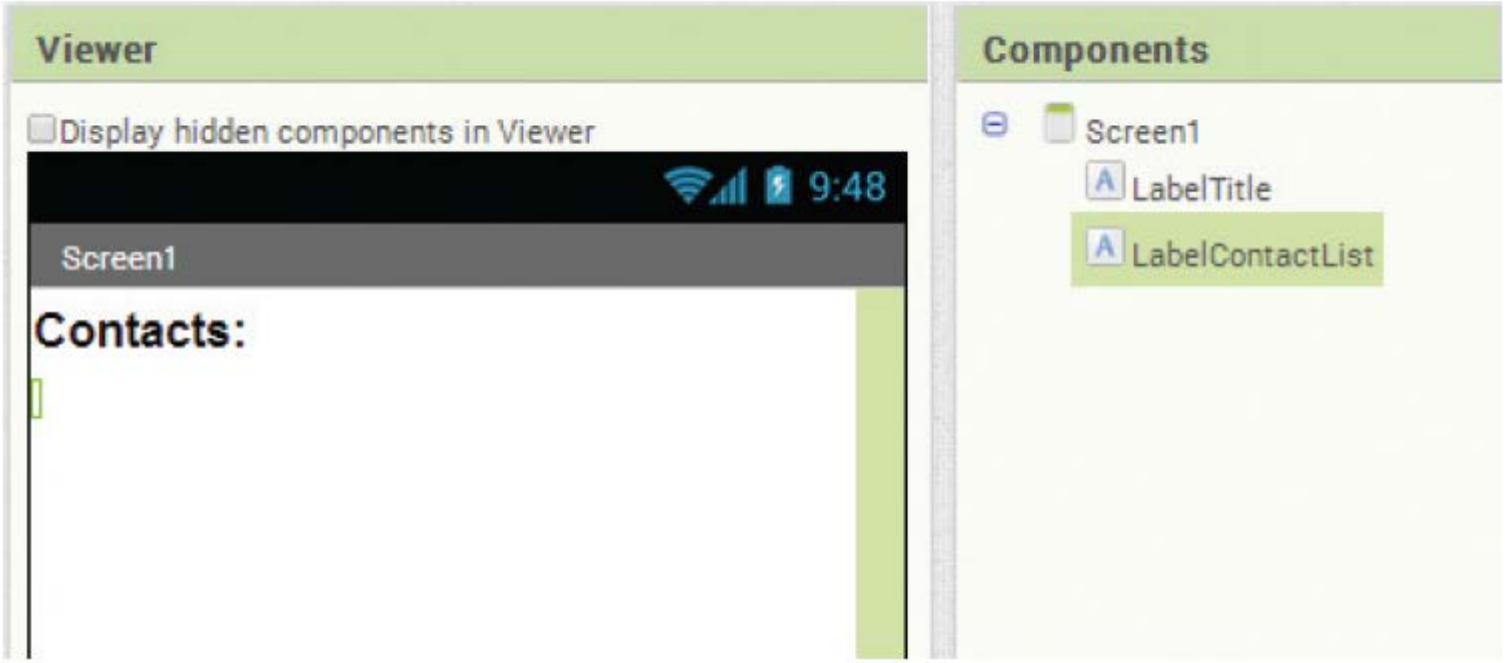
1. Use a component such as a Label to display your list.
2. You must have an event that populates the Label once the list is created.

The `Screen.Initialize` event will work if you want to show the list when your application loads.

Creating a List

Figure 7-3 shows the app in the Designer.

Figure 7-3 Create a List–Design View (*Source:* MIT App Inventor 2)

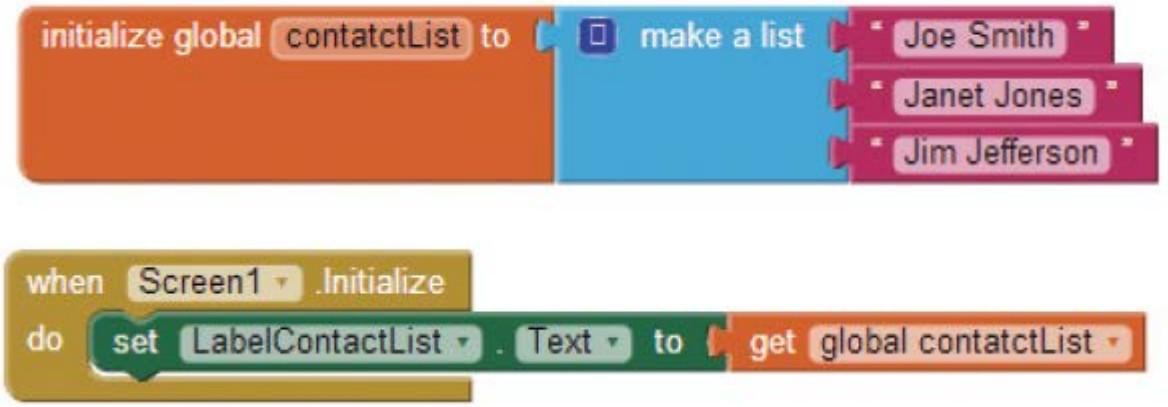


Creating a List

- In Figure a 7-4, we have created a list of names using the `make a list` block.
- We put the names in simple text blocks, and plug those into the `make a list` block.
- Store the entire list in a variable named `ContactList`.
- We use the `Screen1.Initialize` event to set the `LabelContactList.Text` property to the value of the `ContactList` variable.
- Using the `Screen.Initialize` event, we populate the three names as soon as the application loads.

Creating a List

Figure 7-4 Creating a List–Blocks Editor (*Source:* MIT App Inventor 2)



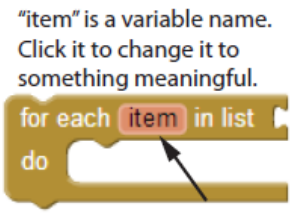
Iterating Over a List with the `for` each Loop

Iteration means to repeat the same process over and over until you reach the result you're looking for. To iterate a list generally means to step through all of the list items, one at a time, until you reach the end.

Iterating Over a List with the `for each` Loop

- The `for each` loop is designed to work with a list.
- When the loop executes, it iterates once for each item in the list.

Figure 7-16 The `for each` Loop (*Source:* MIT App Inventor 2)



- The `for each` block has a variable named `item` after the words "for each".

Iterating Over a List with the `for each` Loop

The `for each` loop executes in the following manner:

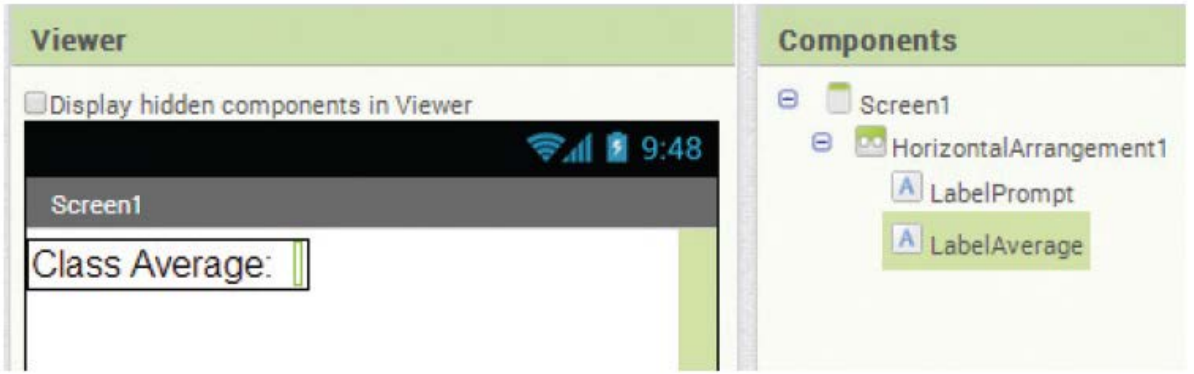
- The `item` variable is assigned the first value in the list.
- The blocks that appear inside the `for each` block are executed.
- The `item` variable is assigned to the next value in the list.
- The blocks that appear inside `for each` block are executed again.
- This continues until the `item` variable has been assigned the last value in the list.

Iterating Over a List with the `for each` Loop

Test Scores Example

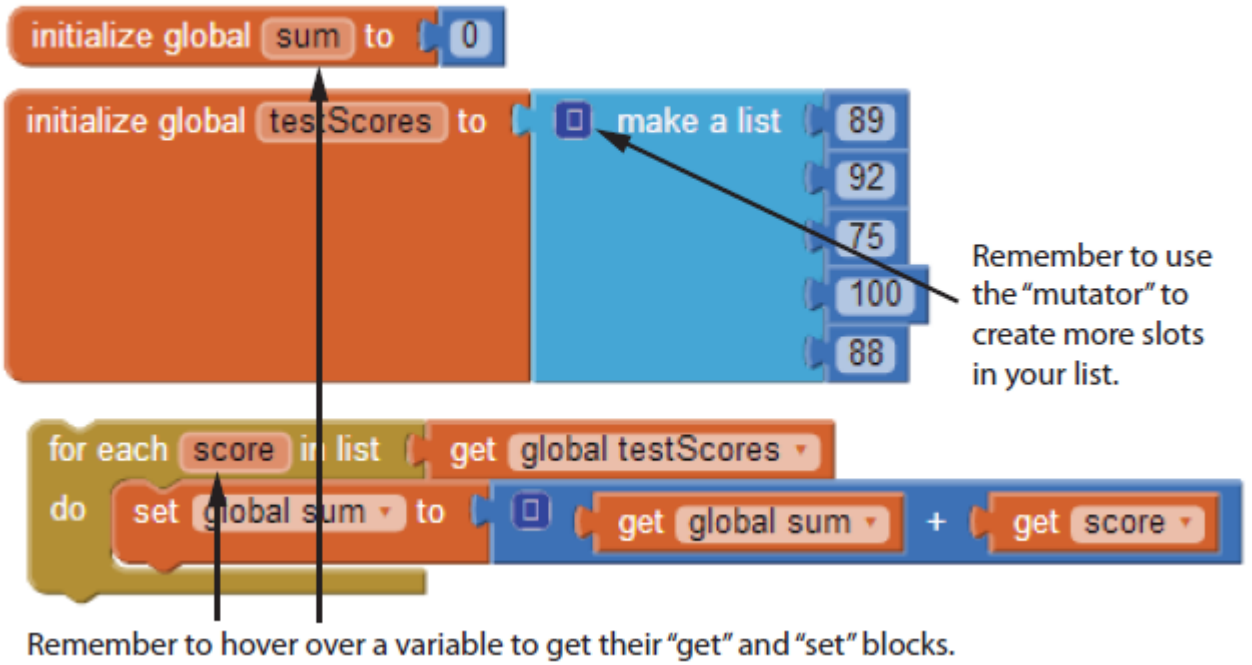
- In the Test Scores example, a list of a class's test scores is created and stored to a variable named `TestScores`.
- We will use a `for each` loop to iterate through the list and accumulate the sum of the scores and calculate the class average.

Figure 7-17 Test Scores App Design (*Source:* MIT App Inventor 2)



Iterating Over a List with the for each Loop

Figure 7-18 Test Scores Code in the Blocks Editor (*Source:* MIT App Inventor 2)



Iterating Over a List with the `for each` Loop

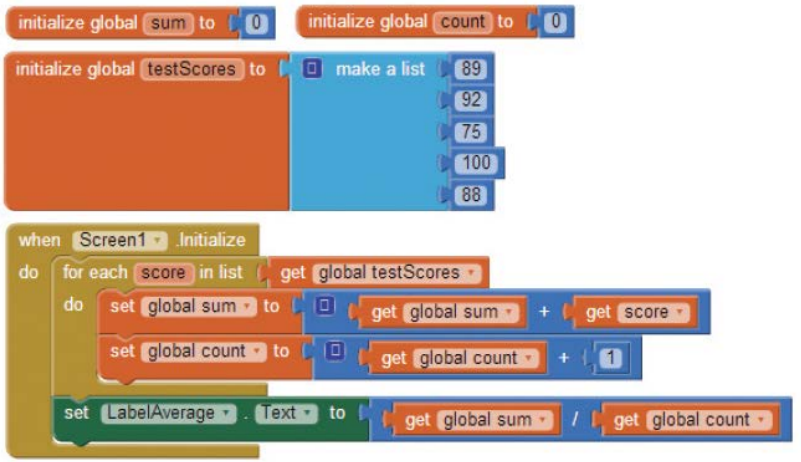
Test Scores Example

1. We create a variable `testScores` to hold the list.
2. We make the list and populate the scores with `number` blocks rather than `text` blocks.
3. We create a variable `sum` to hold the sum of numbers.
4. The `for each` block has an `item` variable and also requires a block, which is the variable that holds a list, to be plugged into it.
5. The block `get global testScores` represents the list that holds the scores, and its “get” block is plugged into the `for each` block.

Iterating Over a List with the `for each` Loop

- After the `for each` iterates through the list, the `Sum` variable will equal all the test scores added together.
- Last, we will need to divide the sum by the number of tests and place that back into the `Text` property of the label as in Figure 7-19

Figure 7-19 Calculating the Average (*Source:* MIT App Inventor 2)



Iterating Over a List with the `for each` Loop

To complete this example:

1. We added a variable named `count`, for the count.
2. We plugged the `for each` loop into the `Screen1.Initialize` event.
3. We added a statement to count by one in each iteration and assigned the results to the `count` variable.
4. We set the results of the some variable divided by the `count` variable to the `LabelAverage.Text` property.

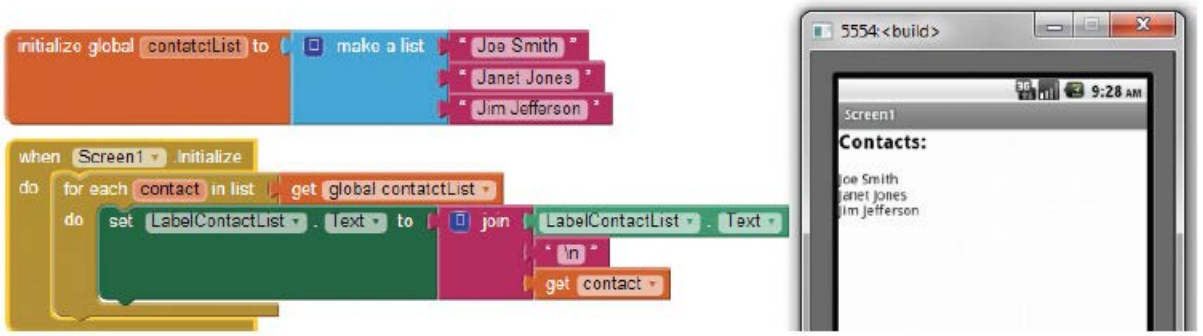
Iterating Over a List with the `for each` Loop

Contact List Example

We are going to print out each list item's value with the return character `\n`, one at a time.

The backslash (\ ) is also known as an e*scape sequence*.

Figure 7-20 Adding the Carriage Return (*Source:* MIT App Inventor 2)



Use the `join text` block to add the item plus the return character `\n` to the label's `Text` property.