MUTLIMEDIA DEVELOPMENT

WITH

APP INVENTOR

MAKE QUIZ WITH APP INVENTOR

QUIZ APP

FEATURES OF THE APP

Quiz Development with App Inventor

- Introduction to Database
- Database concepts in App Inventor
- Input form for entering of information
- Displaying items from multiple lists
- Sharing a web database with 2 phones

QUIZ APP

WHAT YOU'LL CREATE

MakeQuiz and TakeQuiz are two apps that let students take quiz created by their teacher.

- On top of that, parents can create fun trivia apps for their children during a long road trip.

- Grade school teachers can build "Math Blaster" quizzes, and college students can build quizzes to help their study groups prepare for a final.

QUIZ APP

OVERVIEW

You'll design two apps, MakeQuiz for the "teacher" and TakeQuiz for the "student".

With MakeQuiz:

- The user enters questions and answers in an input form.
- The previously entered question-answer pairs are displayed.
- The quiz is stored persistently, in a database.

TakeQuiz will differ in that the questions asked will be those that were entered into the database using MakeQuiz.

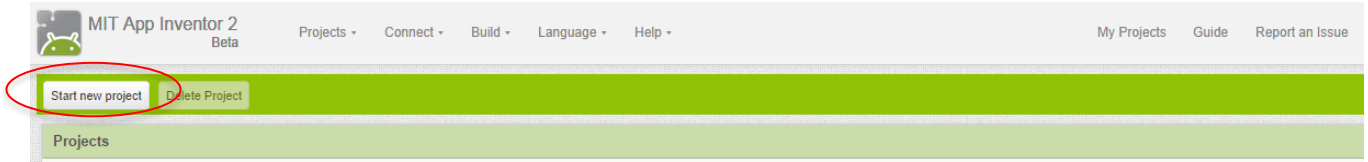
QUIZ APP

INITIAL STEPS

1. Go to “http://ai2.appinventor.mit.edu/”

2. Sign-in with your Gmail account. If you do not have a Gmail account, you can create a free account at “https://www.google.com.sg/” .

3. Click ‘Start new project’



4. Enter Application Name for project : **MakeQuiz**

5. You’ll be presented with the Component Designer

QUIZ APP

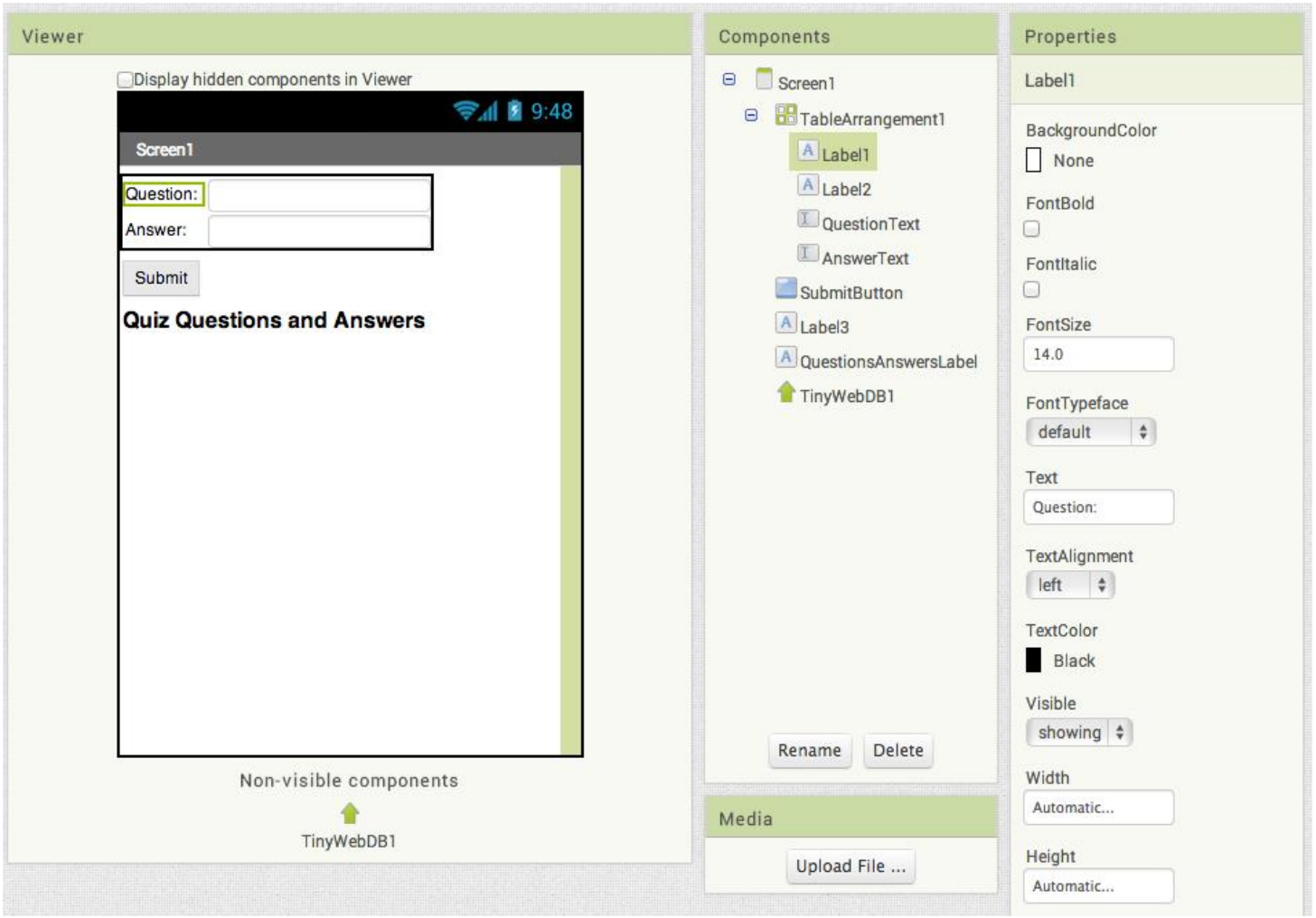
COMPONENT DESIGNER

- Use the Component Designer to create the interface for MakeQuiz.
- Drag each component from the Palette into the Viewer and name it as specified in the table. Note that you can leave the header label names (Label1 – Label4) as their defaults (you won't use them in the Blocks Editor anyway).

Component type	Palette group	What you'll name it	Purpose
TableArrangement	Screen Arrangement	TableArrangement1	Format the form, including the question and answer.
Label	Basic	Label1	The "Question:" prompt.
TextBox	Basic	QuestionText	The user enters questions here.
Label	Basic	Label2	The "Answer:" prompt.
TextBox	Basic	AnswerText	The user enters answers here.
Button	Basic	SubmitButton	The user clicks this to submit a QA pair.
Label	Basic	Label3	Display "Quiz Questions and Answers."
Label	Basic	QuestionsAnswersLabel	Display previously entered QA pairs.
TinyWebDB	Not ready for prime time	TinyWebDB1	Store data to and retrieve data from the database.

QUIZ APP

COMPONENT DESIGNER



QUIZ APP

COMPONENT DESIGNER – PROPERTIES SETUP

1. Set the Text of Label1 to “Question”, the Text of Label2 to “Answer”, and the text of Label3 to “Quiz Questions and Answers”.

2. Set the FontSize of Label3 to 18 and check the FontBold box.

3. Set the Hint of QuestionText to “Enter a question” and the Hint of AnswerText to “Enter an answer”.

4. Set the Text of SubmitButton to “Submit”.

5. Set the Text of QuestionsAnswersLabel to “Questions and Answers”.

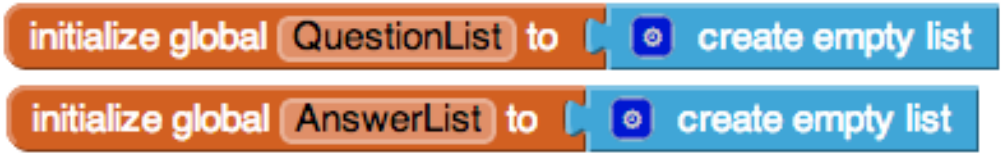
6. Move the QuestionText, AnswerText, and their associated labels into TableArrangement1.

QUIZ APP

BLOCK EDITOR – ADDING BEHAVIORS TO COMPONENTS

7. You'll first define some global variables for the QuestionList and AnswerList.

8. The lists are defined without items in the slots. This is because with MakeQuiz and TakeQuiz, all data will be created by the app user (it is dynamic, user-generated data)

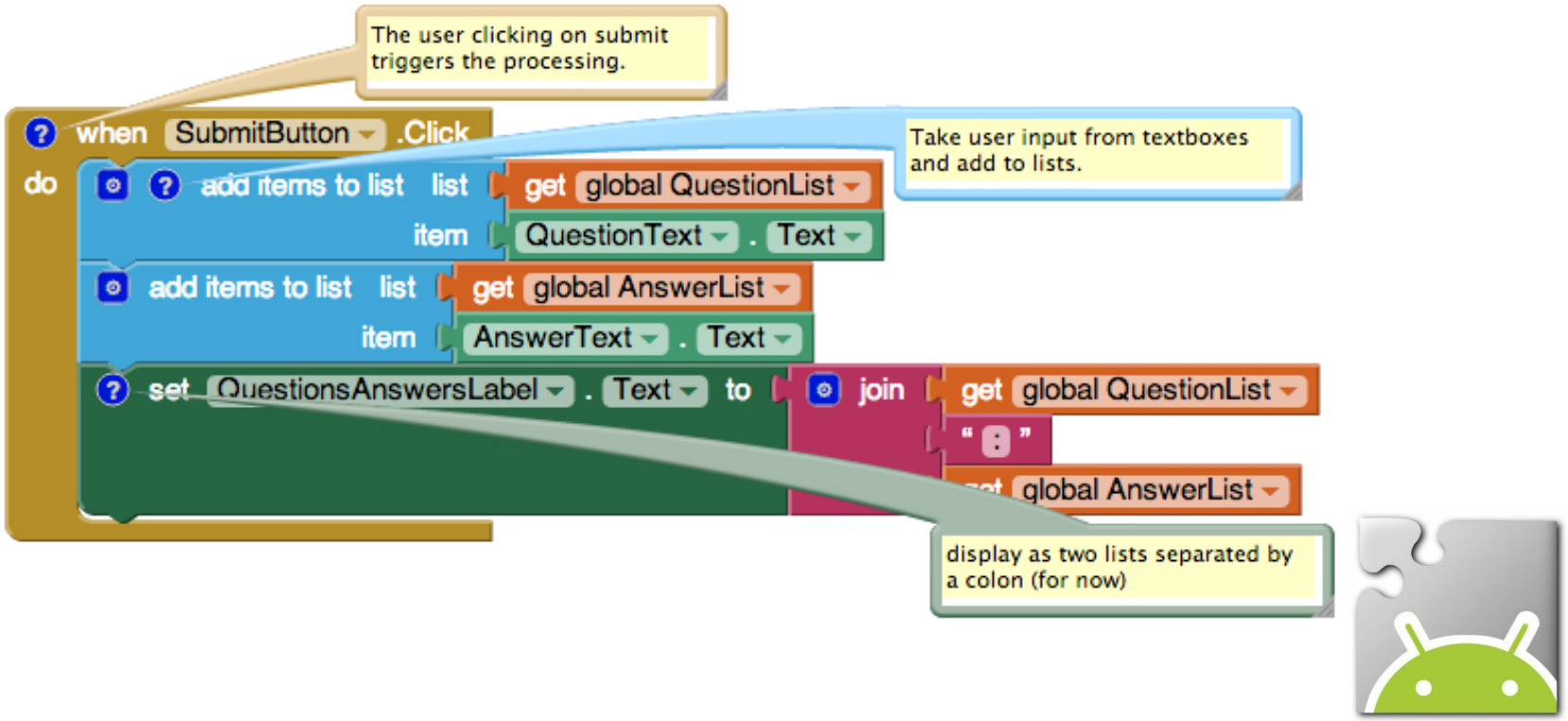


Note: The lists are defined without items in the slots. This is because with MakeQuiz and TakeQuiz, all data will be created by the app user (it is dynamic, user-generated data).

QUIZ APP

COMPONENT DESIGNER – RECORDING THE USER'S ENTRIES.

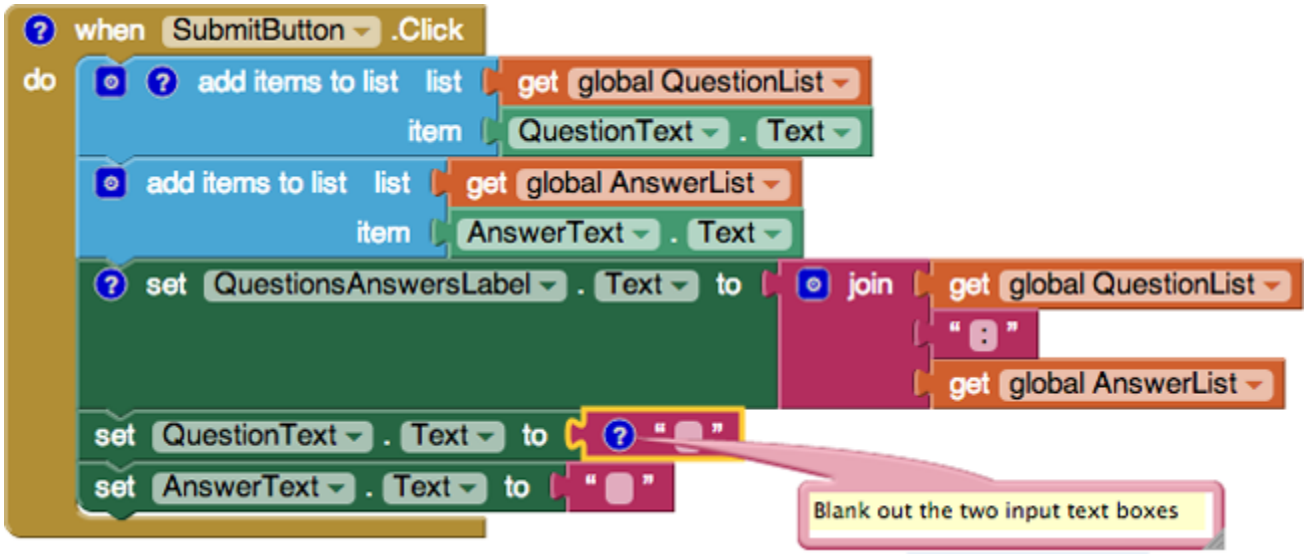
9. The first behavior you'll build is for handling the user's input. Specifically, when the user enters a question and answer and clicks Submit, you'll use add item to list blocks to update the QuestionList and AnswerList.



MULTIMEDIA APP

BLOCK EDITOR – BLANKING OUT QUESTION AND ANSWER

In this app, when a user submits a question-answer pair, you'll want to clear the QuestionText and AnswerText text boxes so that they're ready for a new entry instead of showing the previous one. The blocks should appear as those shown in Figure



Quiz App

Block Editor – Displaying Question-Answer Pairs on Multiple Lines

The task here is a bit more complicated, as you're dealing with two lists. Because of its complexity, you'll put the blocks for it in a procedure named displayQAs, and call that procedure from the SubmitButton.Click event handler.

To display question-answer pairs on separate lines, you'll need to do the following:

- Use a foreach block to iterate through each question in the QuestionList.
- Use a variable answerIndex so that you can grab each answer as you iterate through the questions.
- Use make text to build a text object with each question and answer pair, and a newline character (\n) separating each pair.

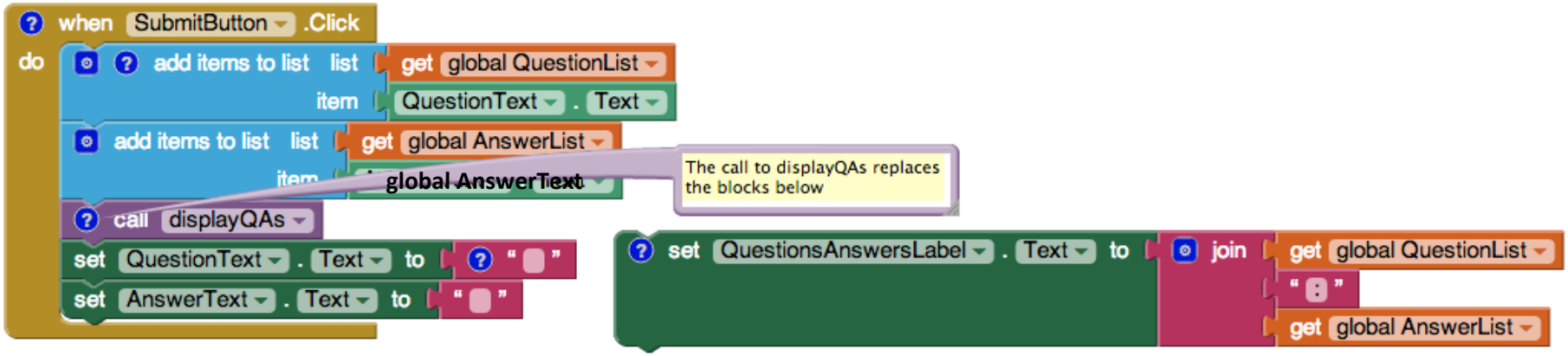
QUIZ APP

BLOCK EDITOR –

The blocks should appear as:

QUIZ APP

BLOCK EDITOR – CALLING THE NEW PROCEDURE



QUIZ APP

BLOCK EDITOR – DATABASE STORAGE

So far, you've created an app that puts the entered questions and answers into a list. But what happens if the quiz maker closes the app?

- Storing the data persistently will allow the quiz maker to view or edit the latest update of the quiz each time the app is opened.
- Persistent storage is also necessary because the TakeQuiz app needs access to the data as well.

- For this purpose you'll be using the TinyWebDB component to store and retrieve data in a database. TinyWebDB stores data in databases that live on the Web.

- Because **TinyWebDB** stores data on the Web, the quiz taker can access the quiz questions and answers on a different device than the quiz maker's. (Online data storage is often referred to as the cloud.)

Quiz App

Block Editor – General Scheme for Making the List Data Persistent:

Here's the general scheme for making list data—like the questions and answers—persistent:

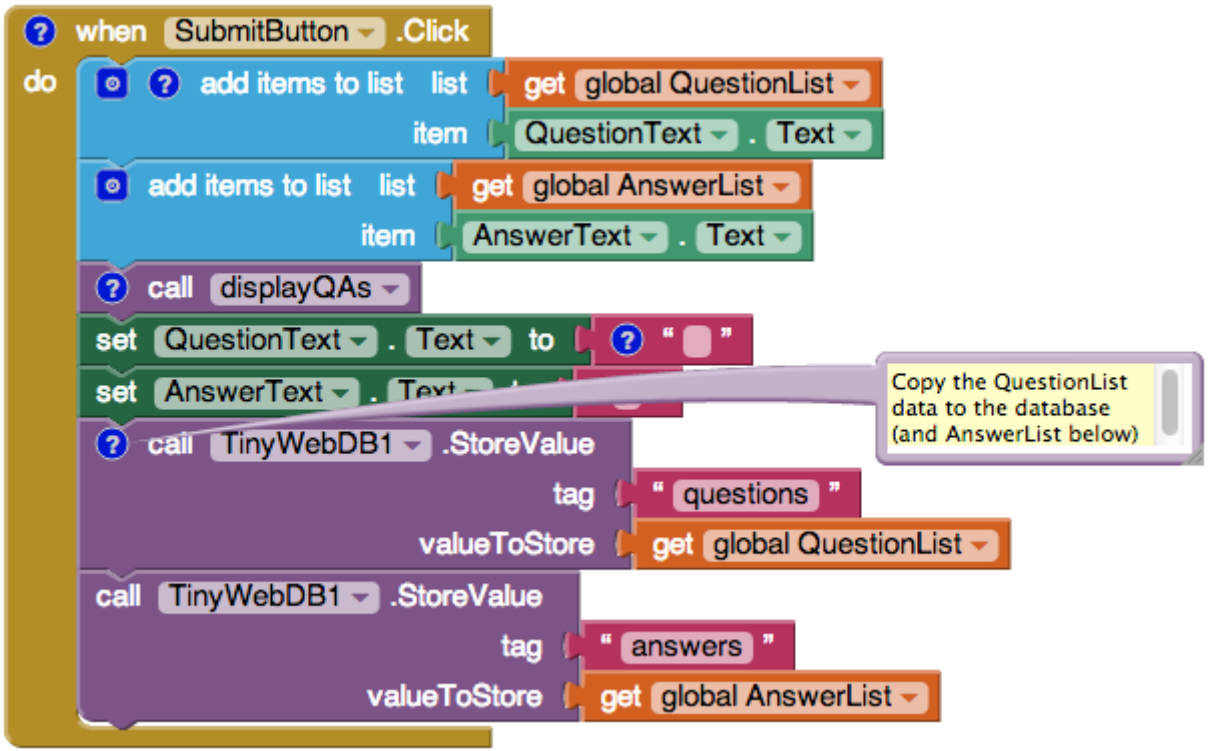
- Store a list to the database each time a new item is added to it.
- When the app launches, load the list from the database into a variable.

Start by storing the QuestionList and AnswerList in the database each time the user enters a new pair.

QUIZ APP

BLOCK EDITOR

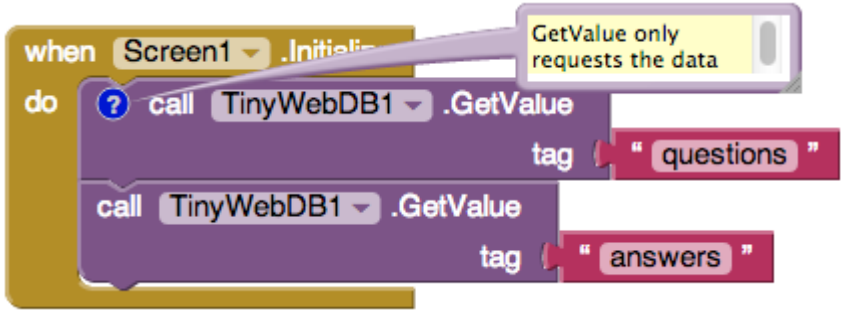
The TinyWebDB1.StoreValue blocks store data in a web database. StoreValue has two arguments: the tag that identifies the data and the value that is the actual data you want to store. As shown in Figure , the QuestionList is stored with a tag of “questions” while the AnswerList is stored with a tag of “answers.” However, for your app, you should use tags that are more distinctive than “questions” and “answers” (e.g., “DavesQuestions” and “DavesAnswers”).



QUIZ APP

BLOCK EDITOR – LOADING DATA FROM DATABASE

- Let's program the blocks for loading the lists back into the app from the web database each time the app is restarted.
- In this case, the app needs to request two lists from the **TinyWebDB** web database—the questions and the answers—so the Screen1.Initialize will make two calls to **TinyWebDB.GetValue.** The blocks should appear as:



TinyWebDB.GetValue only requests the data from the web database; it doesn't immediately receive a value. Instead, when the data arrives from the web database, a **TinyWebDB.GotValue** event is triggered. You must also program another event handler to process the data that is returned.

QUIZ APP

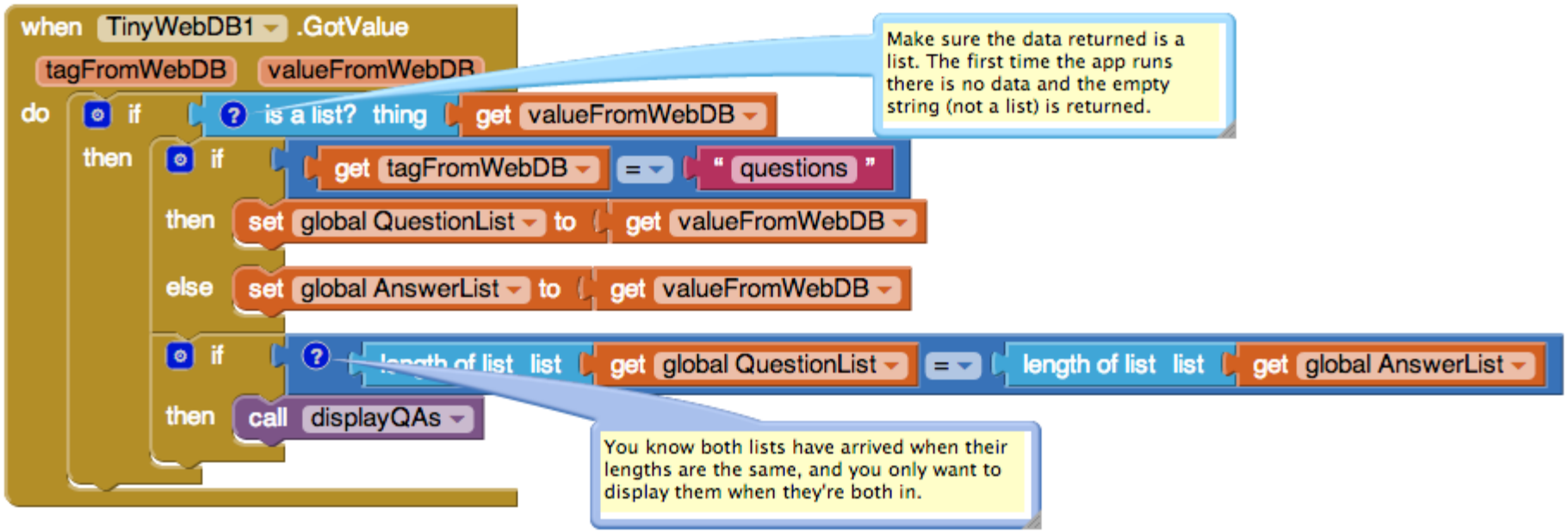
BLOCK EDITOR – LOADING DATA FROM DATABASE

When the TinyWebDB.GotValue event occurs, the data requested is contained in an argument named valueFromWebDB. The tag you requested is contained in the argument tagFromWebDB.

In this app, since two different requests are made for the questions and answers, GotValue will be triggered twice. To avoid putting questions in your AnswerList or vice versa, your app needs to check the tag to see which request has arrived, and then put the value returned from the database into the corresponding list (QuestionList or AnswerList). Now you're probably realizing how useful those tags really are!

QUIZ APP

BLOCK EDITOR – PROCESSING THE LIST



QUIZ APP

BLOCK EDITOR – HOW THE BLOCKS WORK

The app calls TinyWebDB1.GetValue twice: once to request the stored QuestionList and once to request the stored AnswerList. When the data arrives from the web database from either request, the TinyWebDB1.GotValue event is triggered, as shown in Figure.

The valueFromWebDB argument of GotValue holds the data returned from the data- base request. We need the outer if block in the event handler because the database will return an empty text (“”) in valueFromWebDB if it’s the first time the app has been used and there aren’t yet questions and answers. By asking if the valueFromWebDB is a list?, you’re making sure there is some data actually returned. If there isn’t any data, you’ll bypass the blocks for processing it.

Quiz App

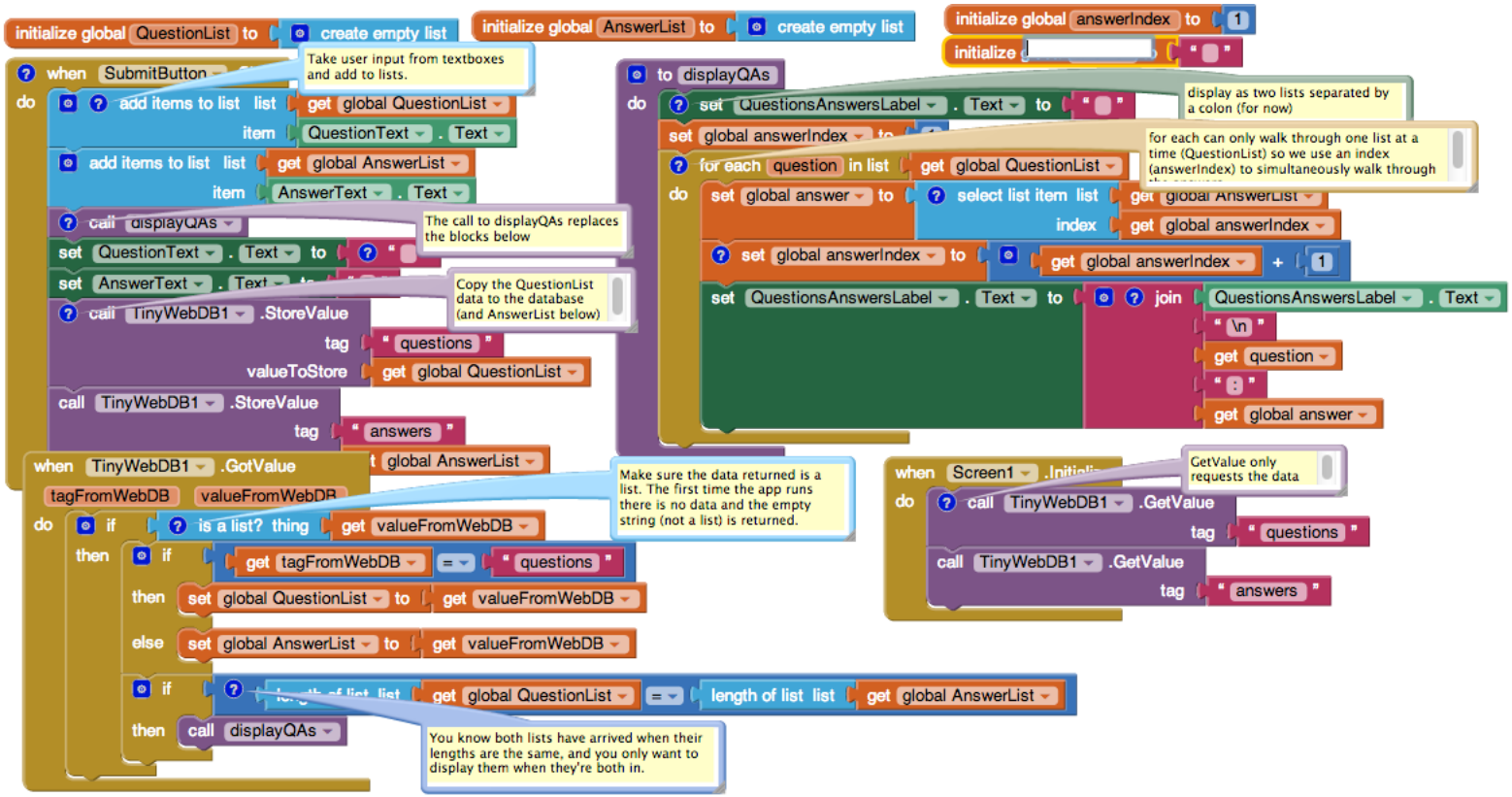
Block Editor – How the Blocks Work

If data is returned (is a list? is true), the blocks go on to check which request has arrived. The tag identifying the data is in tagFromWebDB: it will be either "questions" or "answers." If the tag is "questions," the valueFromWebDB is put into the variable QuestionList. Otherwise (else), it is placed in the AnswerList. (If you used tags other than "questions" and "answers," check for those instead.)

We only want to display the lists after both have arrived (GotValue has been triggered twice). Can you think of how you'd know for sure that you have both lists loaded in from the database? These blocks use an if test to check if the lengths of the lists are the same, as this can only be true if both have been returned. If they are, the handy displayQAs procedure you wrote earlier is called to display the loaded data.

QUIZ APP

BLOCK EDITOR – MAKEQUIZ



TAKE QUIZ

WITH

APP INVENTOR

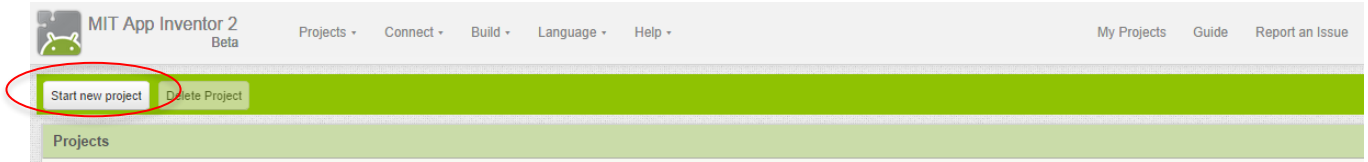
QUIZ APP

INITIAL STEPS

1. Go to “http://ai2.appinventor.mit.edu/”

2. Sign-in with your Gmail account. If you do not have a Gmail account, you can create a free account at “https://www.google.com.sg/” .

3. Click ‘Start new project’

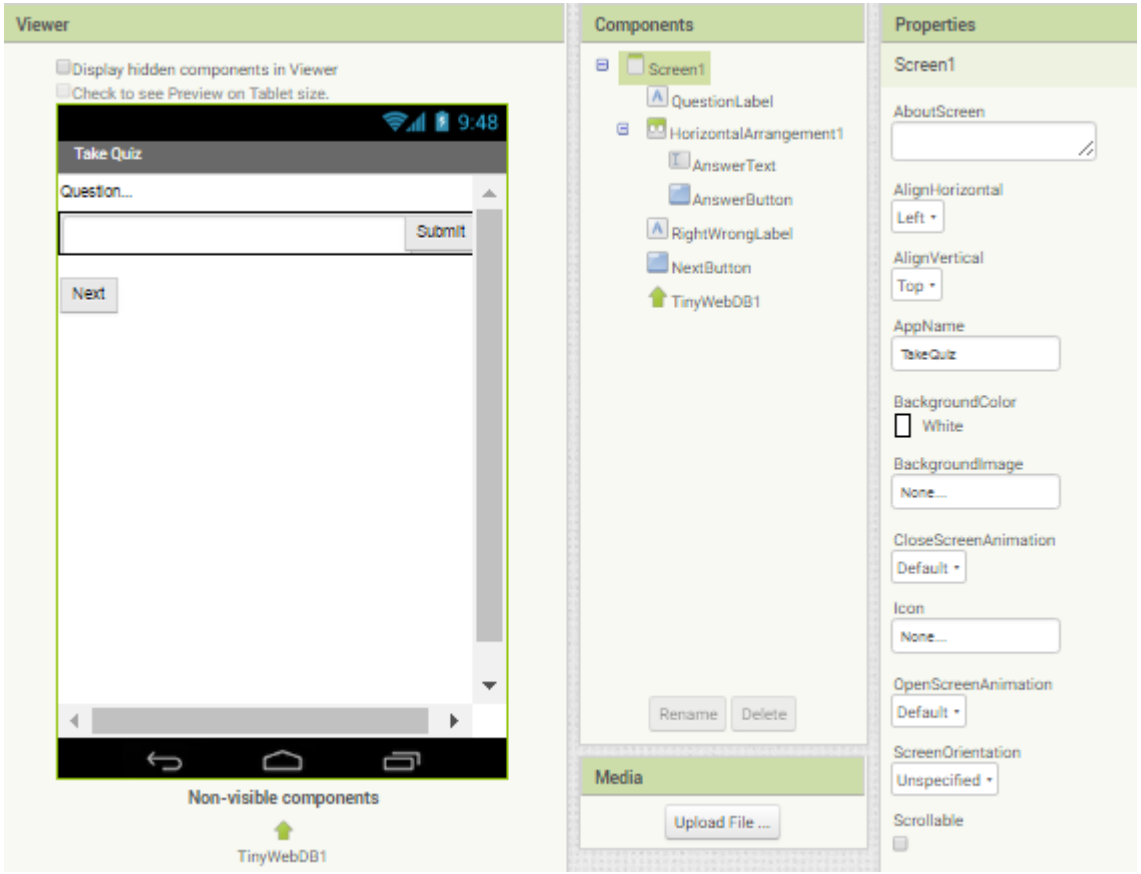


4. Enter Application Name for project : TakeQuiz

5. You’ll be presented with the Component Designer

QUIZ APP

COMPONENT DESIGNER– TAKEQUIZ:



QUIZ APP

COMPONENT DESIGNER– TAKEQUIZ:

Add the components listed in Table :

Component type	Palette group	What you'll name it	Purpose
`Label`	User Interface	`QuestionLabel`	Display the current question.
`HorizontalArrangement`	Layout	`HorizontalArrangement1`	Put the answer text and button in a row.
`TextBox`	User Interface	`AnswerText`	The user will enter his answer here.
`Button`	User Interface	`AnswerButton`	The user clicks this to submit an answer.
`Label`	User Interface	`RightWrongLabel`	Display "correct!" or "incorrect!"
`Button`	User Interface	`NextButton`	The user clicks this to proceed to the next question.

QUIZ APP

COMPONENT DESIGNER– TAKEQUIZ:

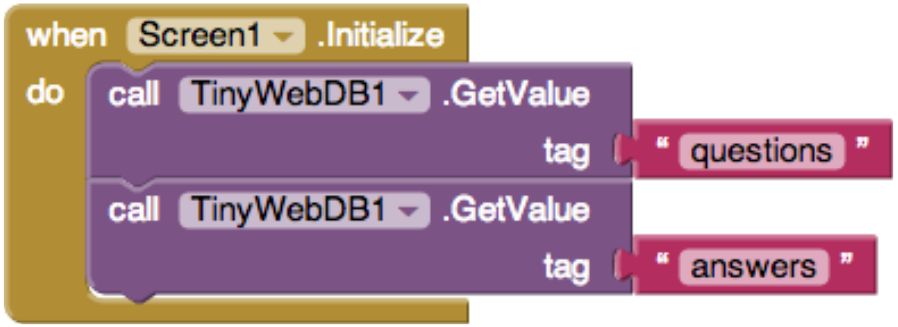
1. Set QuestionLabel.Text to “Question...” (you’ll input the first question in the Blocks Editor).
2. Set AnswerText.Hint to “Enter an answer”. Set its Text property to blank. Move it into HorizontalArrangement1.
3. Change AnswerButton.Text to “Submit” and move it into HorizontalArrangement1.
4. Change NextButton.Text to “Next”.
5. Change RightWrongLabel.Text to blank.
6. Because TakeQuiz will work with database data that resides on the Web, drag a TinyWebDB component into the app.
7. Because you don’t want the user to answer or click the NextButton until the questions are loaded, uncheck the Enabled property of the AnswerButton and NextButton.

QUIZ APP

BLOCK EDITOR – TAKEQUIZ: AN APPLICATION FOR TAKING THE QUIZ IN THE DATABASE

8. Now, add the blocks so that the quiz given to the user is loaded from the database. The resulting blocks should appear as shown in Figure

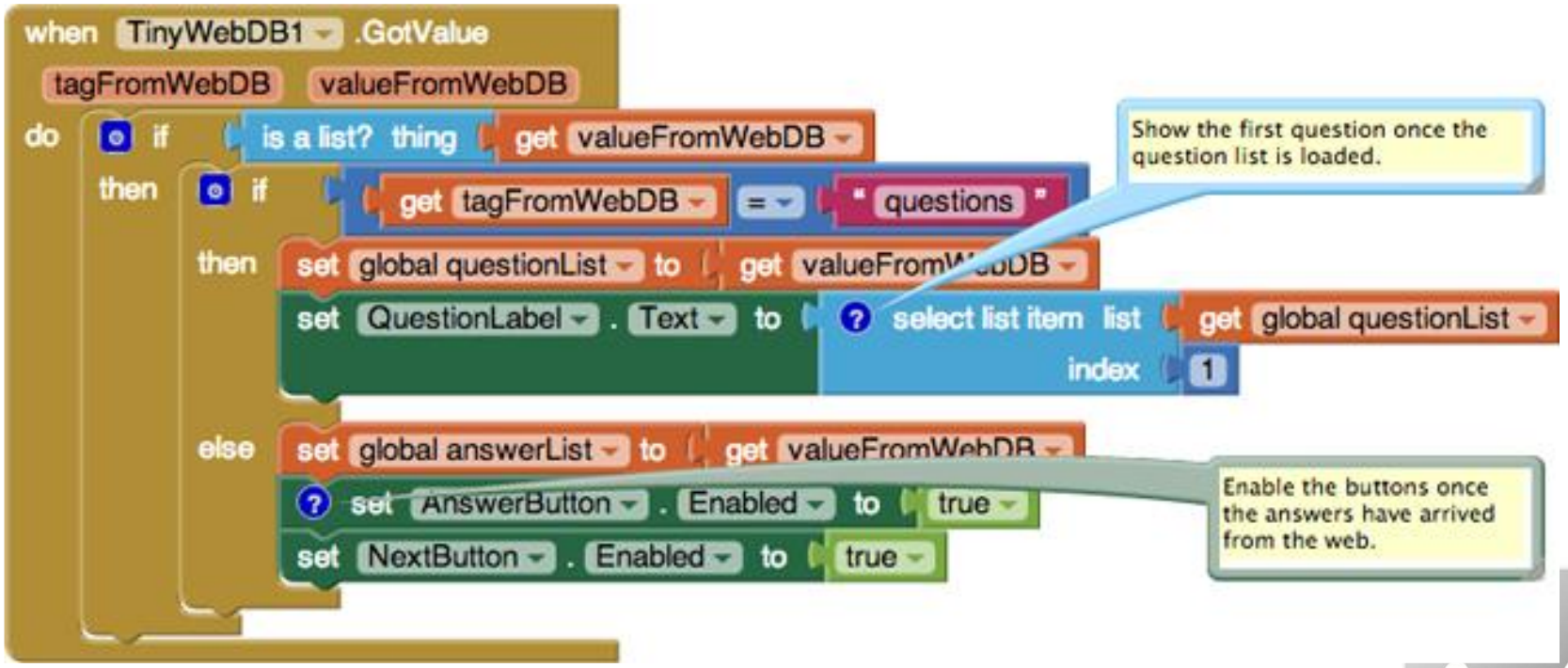
9. Now, modify your Screen1.Initialize so that it calls TinyWebDB.GetValue twice to load the lists, just as you did in MakeQuiz. The blocks should look as they do in Figure



QUIZ APP

BLOCK EDITOR – TAKEQUIZ: AN APPLICATION FOR TAKING THE QUIZ IN THE DATABASE

10. Finally, drag out a TinyWebDB.GotValue event handler. This event handler should look similar to the one used in MakeQuiz, but here you want to show only the first question and none of the answers. Try making these changes yourself first, and then take a look at the blocks in Figure to see if they match your solution.



QUIZ APP

BLOCK EDITOR – HOW THE BLOCK WORKS

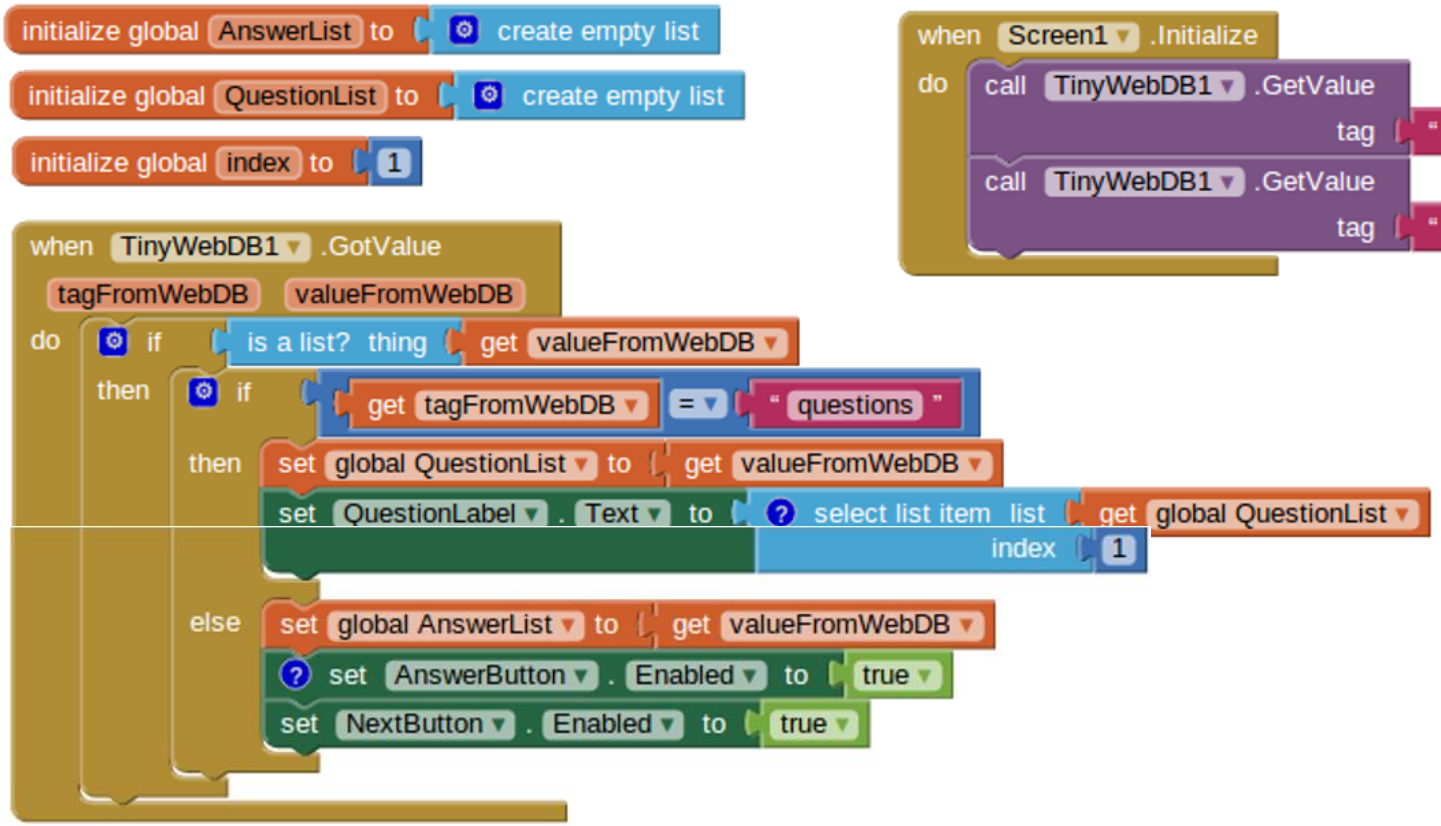
When the app starts, Screen1.Initialize is triggered and the app requests the questions and answers from the web database. When each request arrives, the Tiny WebDB.GotValue event handler is triggered. The app first checks if there is indeed data in valueFromWebDB using is a list? If it finds data, the app asks which request has come in, using tagFromWebDB, and places the valueFromWebDB into the appropriate list.

If the QuestionList is being loaded, the first question is selected from QuestionList and displayed. If the AnswerList is being loaded, the AnswerButton and NextButton are enabled so that the user can begin taking the test.
These are all the changes you need for TakeQuiz. If you've added some questions and answers with MakeQuiz and you run TakeQuiz, the questions that appear should be the ones you input.

QUIZ APP

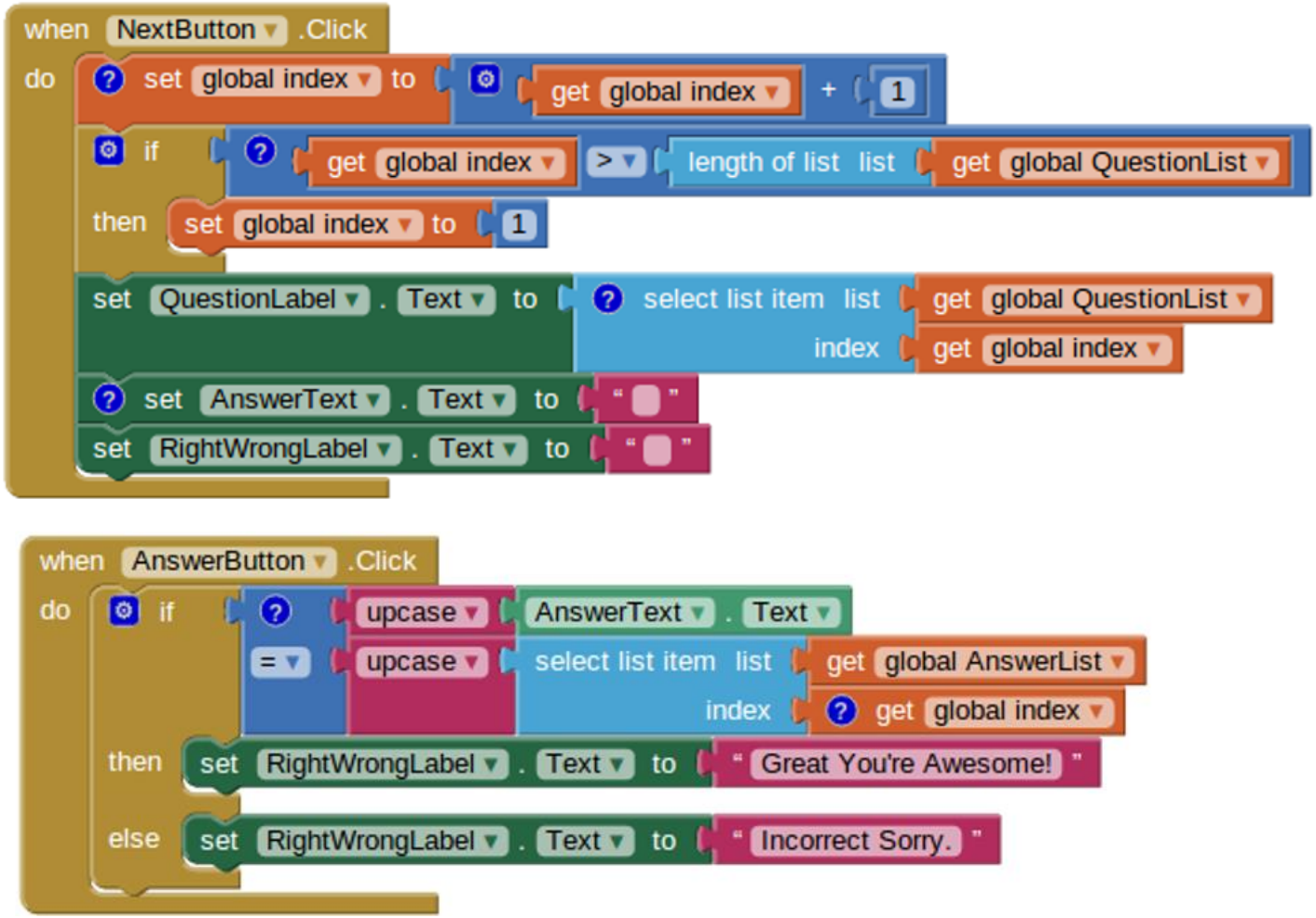
BLOCK EDITOR – THE COMPLETE APP : TAKE QUIZ

Figure 10-15 shows the blocks for the entire TakeQuiz app.



QUIZ APP

BLOCK EDITOR – THE COMPLETE APP - CONTD



Quiz App

Variations – to explore

- Allow the quiz maker to specify an image for each question. This is a little complicated because TinyWebDB doesn't allow you to store images. Therefore, the images will need to be URLs to pictures on the Web, and the quiz maker will need to enter these URLs as a third item in the MakeQuiz form. Note that you can set the Picture property of an Image component to a URL.
- Allow the quiz maker to delete items from the questions and answers. You can let the user choose a question by using the ListPicker component, and you can remove an item with the remove list item
- Let the quiz maker name the quiz. You'll need to store the quiz name under a different tag in the database, and you'll need to load the name along with the quiz in TakeQuiz. After you've loaded the name, use it to set the Screen.Title property so that it appears when the user takes a quiz.
- Allow multiple named quizzes to be created. You'll need a list of quizzes, and you can use each quiz name as (part of) the tag for storing its questions and answers.

QUIZ APP

SUMMARY

Here are some of the concepts we covered in this chapter:

• Dynamic data is information input by the app's user or loaded in from a database.A program that works with dynamic data is more abstract.

• You can store data persistently in a web database with the TinyWebDB component.

• You retrieve data from a TinyWebDB database by requesting it with TinyWebDB.GetValue. When the web database returns the data, the TinyWebDB.GotValue event is triggered. In the TinyWebDB.GotValue event handler, you can put the data in a list or process it in some way.

• TinyWebDB data can be shared among multiple phones and apps

THANK YOU

SEE YOU AGAIN