



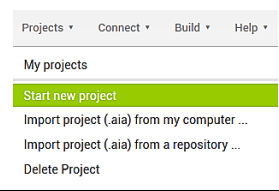
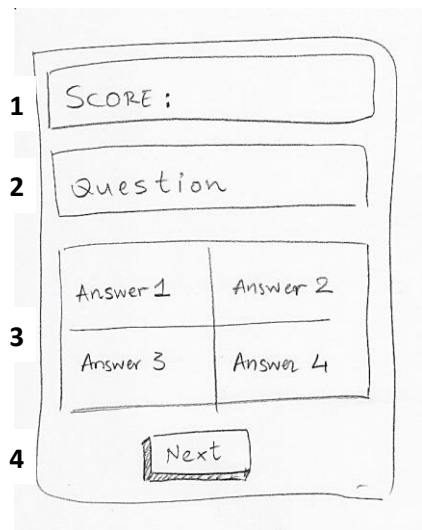
## Worksheet 4 (Part A)

### Creating a simple Quiz

**Activity:** You will create a simple quiz with two questions.  
First, you will **design the interface** of the app screen in AppInventor.

**Time:** 35 Minutes

*Follow your facilitator and complete the tasks below (put a mark if completed).  
Don't hesitate to ask if there is something you are not sure of.*

TASK	DONE?
<p><b>Assigning Teams</b></p> <ul style="list-style-type: none"> <li>To accomplish this task you have to team up with your host/guest fellow student.</li> </ul>	
<p><b>Connecting to AppInventor</b></p> <ul style="list-style-type: none"> <li>Open a browser, e.g. Firefox, Chrome, MS Edge, Safari.</li> <li>In the address bar of your browser type <a href="http://ai2.appinventor.mit.edu">http://ai2.appinventor.mit.edu</a> .</li> <li>Sign in with your Google Account.</li> <li>After this you're presented with the AppInventor environment.</li> </ul>	
<p><b>Starting a new project</b></p> <ol style="list-style-type: none"> <li>From the menu click "Projects" and then choose "Start New Project".</li> <li>Enter the project name, <b>SimpleQuiz</b>, and then click OK.</li> </ol>	
<p><b>Designing the interface</b></p> <ul style="list-style-type: none"> <li>Make a simple draft of your Quiz interface on paper.</li> </ul> <p><i>How do you want it to look like? What components should it include?</i></p> <ul style="list-style-type: none"> <li>We will use the "Layout" tools to arrange all the components on the screen (points 1, 2, 3 and 4).</li> </ul> <p>Choose and drag the components from the Palette category "Layout" in the following order:</p> <p align="center">point 1: <b>HorizontalArrangement</b> point 2: <b>HorizontalArrangement</b> point 3: <b>TableArrangement</b> point 4: <b>HorizontalArrangement</b></p>	



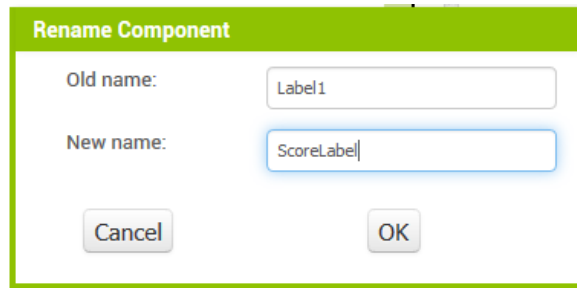
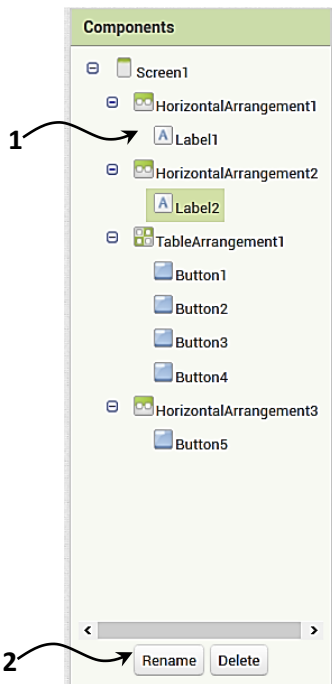
- For every component drawn on the screen change the “Width” to **Fill Parent**.



What do you notice?

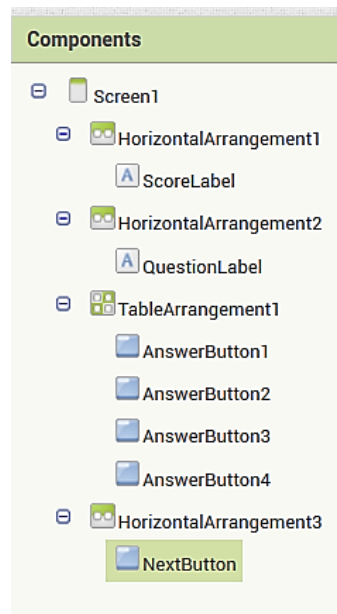
- We need “Labels” for text output, such as the *score* and the *question*. Then, we want the user to “click on” the answers while choosing, so we decide to draw buttons for our 4 possible answers. We also need a “Button” to click in order to proceed to the next question.
- Drag from the Palette the appropriate components to the screen, either **Label1** or **Button**, as shown below.

- Change the names of the labels and the buttons in “Components” by clicking first the name and then “Rename” as shown on the next page.



Repeat this for the label and button components as follows:  
 Label1 → **ScoreLabel**  
 Label2 → **QuestionLabel**,  
 Button1 → **AnswerButton1**,  
 Button2 → **AnswerButton2**,  
 Button3 → **AnswerButton3**,  
 Button4 → **AnswerButton4**,  
 Button5 → **NextButton**

- At the end it should look like this



## Changing Properties

General Rule: First click on the component, then change/edit the properties of it.

- Change the “FontSize” of the **QuestionLabel** to **18.0**
- Change the “TextColor” for **every AnswerButton** to **blue**
- Change the “AlignHorizontal” of the **HorizontalArrangement3** to **Center**.



- Change the “Text” property of every component to look like as below

Screen1	
Score:	
Question	
answer1	answer2
answer3	answer4
NEXT	




## Worksheet 4 (Part B)

### Creating a simple Quiz

**Activity:** You will program the components of your app “to tell them what to do”.

**Time:** 35 Minutes

*Follow your facilitator and complete the tasks below (put a mark if completed).  
Don't hesitate to ask if there is something you are not sure of.*

TASK	DONE?
<div style="display: flex; align-items: center; margin-bottom: 10px;"> <p><b>“What should the app do?”</b></p> </div> <p>First, we have to think about how we want the app to “behave”.</p> <p>How should the components interact? For example,</p> <ul style="list-style-type: none"> <li>When the screen initializes (the app starts) the first question and 4 possible answers should be shown.</li> <li>Then the user clicks on an answer.</li> <li>The app evaluates if it's correct and</li> <li>...gives feedback by changing the color of the correct answer button to GREEN</li> <li>Maybe all the other buttons should be deactivated to prevent the user on trying different choices.</li> <li>If the answer is correct the score should be updated “+1”.</li> </ul> <p>Finally, the user can move to the next question.</p>	
<p><b>Blocks editor</b></p> <p>Switch to the BLOCKS editor (upper right corner).</p> <p>Create/Initialize 3 variables: the <b>score</b>, a <b>questionList</b> and an <b>answerList</b></p> <div style="display: flex; justify-content: space-around; margin: 10px 0;"> <div style="border: 1px solid #ccc; padding: 5px; width: 45%;"> <p style="font-size: small; margin: 0;">Blocks</p> <ul style="list-style-type: none"> <li>Built-in</li> <li>Control</li> <li>Logic</li> <li>Math</li> <li>Text</li> <li>Lists</li> <li>Colors</li> <li style="background-color: #e0e0e0;">Variables</li> <li>Procedures</li> <li>Screen1</li> <li>HorizontalArrangemen</li> </ul> </div> <div style="border: 1px solid #ccc; padding: 5px; width: 45%;"> <p style="font-size: small; margin: 0;">Viewer</p>  </div> </div> <ul style="list-style-type: none"> <li>When the app starts, we initialize our <b>score</b> to 0,</li> <li>...create a list with one question “What is the capital of Spain?”</li> <li>and create a second list within a list of possible answers.</li> </ul>	



Follow the instructions as shown below.

```

initialize global score to 0
initialize global questionList to make a list " What is the capital of Spain? "
initialize global answerList to make a list make a list " Sevilla " " Madrid " " Cordoba " " Alicante " 2
    
```



Why did we create the *answerList* as "a list within a list"?



What does the number "2" represent in the list of possible answers?

Now you have to **set** the texts of the **QuestionLabel** and all the **AnswerButton**'s.

Follow the instructions as shown below.

```

when Screen1 .Initialize
do
  set QuestionLabel .Text to select list item list get global questionList index 1
  set AnswerButton1 .Text to select list item list select list item list get global answerList index 1 index 1
  set AnswerButton2 .Text to select list item list select list item list get global answerList index 1 index 2
  set AnswerButton3 .Text to select list item list select list item list get global answerList index 1 index 3
  set AnswerButton4 .Text to select list item list select list item list get global answerList index 1 index 4
    
```



### Selecting a list item

We select a list item with the use of an “index number”.

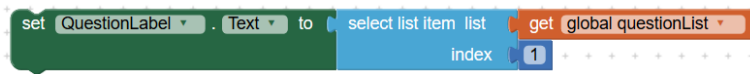
#### Example:

The `questionList` has only one item.

This item holds the text “*What is the capital of Spain?*”



If you want to use the text of this item (1<sup>st</sup> in the list) you have to use the following programming block with the index number 1.



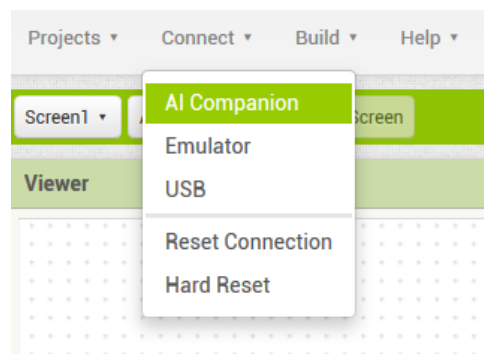
What is the index number for the item “Madrid”? How do you refer to it?

### Testing the app

**TIP:** Before testing the app you should download the “MIT AI2 Companion” from Google Play.

Connect your smartphone or tablet from the Connect menu at the top of your screen.

1. Connect your smartphone on the Wi-Fi network.
2. Choose AI Companion from the Connect menu
3. A unique app code appears in both QR and text form.
4. On your phone start the MIT AI2 Companion app.
5. Either type the app code and click “Connect with Code” or click “Scan the QR Code” and point your phone at the QR code on your computer screen.



**Try your app by pressing the buttons.**



Do the buttons have some functionality?





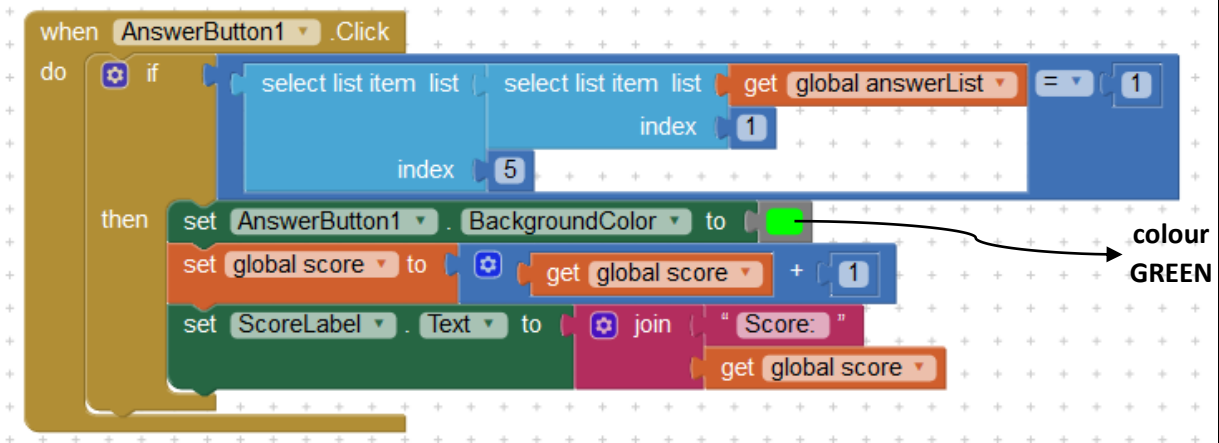
## Worksheet 4 (Part C)

### Creating a simple Quiz

**Activity:** Adding functionality to the buttons.

**Time:** 15 Minutes

Follow your facilitator and complete the tasks below (put a mark if completed).  
 Don't hesitate to ask if there is something you are not sure of.

TASK	DONE?
<div>  </div> <p><b>“What should the buttons do?”</b></p> <p>If the user clicks on an Answer button, then the answer should be evaluated if it's correct.</p> <p>The correct answer is given by the number (in this example 2) in the list of possible answers.</p> <div>  </div> <ul style="list-style-type: none"> <li>•</li> <li>• If the user clicks on the correct Answer button,       <ul style="list-style-type: none"> <li>○ then <b>a)</b> it should change its background to green and <b>b)</b> update the score to +1.</li> </ul> </li> <li>• If the user clicks the wrong button, then do nothing.</li> </ul>	
<p><b>Follow the instructions as shown below</b></p>	
<div>  </div>	





<pre> when AnswerButton2.Click do   if (select list item list index 5 = get global answerList)   then     set AnswerButton2.BackgroundColor to colour GREEN     set global score to get global score + 1     set ScoreLabel.Text to join "Score: " and get global score </pre>	
<p><b>Repeat the above for the remaining two (2) AnswerButtons.</b></p> <p><b>TIP:</b> To save time <u>Right Click</u> on the <u>outer block</u> and <u>duplicate</u> it.</p> <p><b>Important:</b> Make the necessary changes.</p>	



## Worksheet 4 (Part D)


### Creating a simple Quiz

**Activity:** Adding a second question with four possible answers.

**Time:** 10 Minutes

*Follow your facilitator and complete the tasks below (put a mark if completed).*

*Don't hesitate to ask if there is something you are not sure of.*

TASK	DONE?
 <p><b>“Think of a new question”</b></p> <p>Write down your question and 4 possible answers.</p>	
<p><b>Following the previous instructions (as in Worksheet 4 part B) to add your question and answers in the programming blocks.</b></p>	



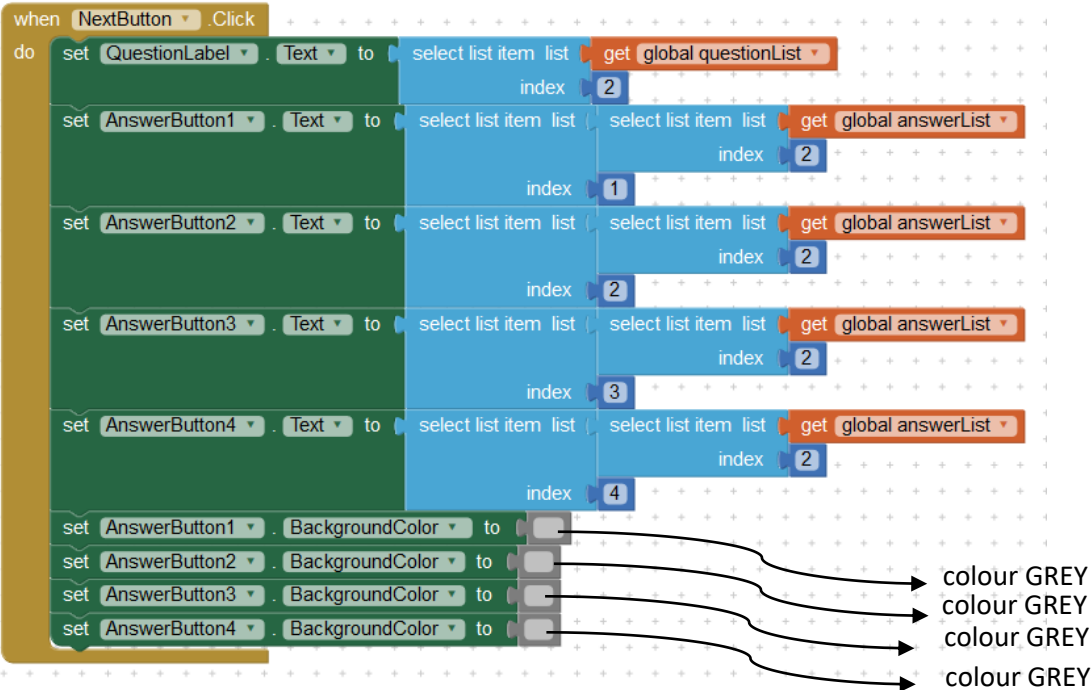
## Worksheet 4 (Part E)

### Creating a simple Quiz

**Activity:** Programming the NEXT button.

**Time:** 15 Minutes

Follow your facilitator and complete the tasks below (put a mark if completed).  
Don't hesitate to ask if there is something you are not sure of.

TASK	DONE?
<div> </div> <p><b>“What actions should be taken after pressing the NEXT button?”</b></p> <p>To programme the next screen we have first to “initialize” certain components.</p> <ol style="list-style-type: none"> <li>1. Set/Load the <b>QuestionLabel</b> to the new question</li> <li>2. Set/Load the new answers into the <b>AnswerButton</b>'s.</li> <li>3. Un-color the green button, i.e. all buttons should have the same grey colour.</li> </ol>	
<p><b>Follow the instructions as shown below.</b></p>	
 <p>The image shows a Scratch script for a 'NextButton' click event. It starts with a 'do' block containing several 'set' blocks. The first 'set' block sets 'QuestionLabel' . Text to 'select list item list' with 'get global questionList' and index '2'. The next four 'set' blocks set 'AnswerButton1' through 'AnswerButton4' . Text to 'select list item list' with 'get global answerList' and indices '2', '2', '3', and '2' respectively. The final four 'set' blocks set 'AnswerButton1' through 'AnswerButton4' . BackgroundColor to 'colour GREY'. Arrows point from the 'colour GREY' text to the 'Background Color' dropdowns in the code blocks.</p>	
<p><b>Test your application.</b></p>	
<div> </div> <p><i>Does your application function properly? Are there any problems?</i></p> <p><i>How would you deal with them?</i></p>	





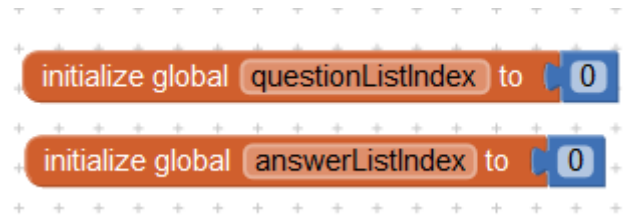
## Worksheet 4 (Part F)

### Creating a simple Quiz

**Activity:** Recognizing and resolving problems.

**Time:** 15 Minutes

*Follow your facilitator and complete the tasks below (put a mark if completed).  
Don't hesitate to ask if there is something you are not sure of.*


TASK	DONE?
<p><b>“Problem identification”</b></p> <ul style="list-style-type: none"> <li>We move to the next question but the the next set of answers isn't loaded.</li> <li>The app doesn't highlight the correct answer (green button) when clicked.</li> <li>Score is not incremented.</li> </ul>	
<p><b>“Problem resolving”</b></p> <ul style="list-style-type: none"> <li>To resolve the above issues we have to make use of variables.</li> </ul>	
<div style="display: flex; align-items: center;">  <p><b>Variables</b></p> </div> <p>Variables are “containers” of information that can be manipulated.</p> <p>In AppInventor we use the built-in programming blocks “<b>Initialize</b>”, “<b>Get</b>” and “<b>Set</b>” for this purpose.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;">  </div>	
<p>We will create a new variable called “<b>questionListIndex</b>” to hold the index number of the questionList and a “<b>answerListIndex</b>” to hold the index number for the answerList.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;">  </div>	
<p>We also have to <u>edit</u> the programming blocks to accommodate this change.</p> <p>Follow the instructions as shown below.</p>	



<pre> when Screen1.Initialize do   set global questionListIndex to (get global questionListIndex + 1)   set global answerListIndex to (get global answerListIndex + 1)   set QuestionLabel.Text to (select list item list (get global questionList) (get global questionListIndex))   set AnswerButton1.Text to (select list item list (select list item list (get global answerList) (get global answerListIndex)) (1))   set AnswerButton2.Text to (select list item list (select list item list (get global answerList) (get global answerListIndex)) (2))   set AnswerButton3.Text to (select list item list (select list item list (get global answerList) (get global answerListIndex)) (3))   set AnswerButton4.Text to (select list item list (select list item list (get global answerList) (get global answerListIndex)) (4))         </pre>	<p><b>Add new instructions</b></p> <p>Get <u>first</u> question</p> <p>Get <u>first</u> answer choice</p> <p>Get <u>second</u> answer choice</p> <p>Get <u>third</u> answer choice</p> <p>Get <u>fourth</u> answer choice</p>
<pre> when AnswerButton1.Click do   if (select list item list (select list item list (get global answerList) (get global answerListIndex)) (5))   then     set AnswerButton1.BackgroundColor to green     set global score to (get global score + 1)     set ScoreLabel.Text to (join ("Score: " (get global score)))         </pre>	<p>Get <u>first</u> answer choice</p>

**Repeat this for the remaining three (3) answer programming blocks.**



<pre> when NextButton .Click do   set global questionListIndex to (get global questionListIndex) + 1   set global answerListIndex to (get global answerListIndex) + 1   set QuestionLabel .Text to (select list item list (get global questionList) index (get global questionListIndex))   set AnswerButton1 .Text to (select list item list (select list item list (get global answerList) index (get global answerListIndex)) index 1)   set AnswerButton2 .Text to (select list item list (select list item list (get global answerList) index (get global answerListIndex)) index 2)   set AnswerButton3 .Text to (select list item list (select list item list (get global answerList) index (get global answerListIndex)) index 3)   set AnswerButton4 .Text to (select list item list (select list item list (get global answerList) index (get global answerListIndex)) index 4)   set AnswerButton1 .BackgroundColor to #   set AnswerButton2 .BackgroundColor to #   set AnswerButton3 .BackgroundColor to #   set AnswerButton4 .BackgroundColor to #         </pre> <p style="text-align: right;">} Point to NEXT question</p>	
<p><b>Test your application.</b></p>	
<p> Does your application function properly?</p>	



## Worksheet 5

### Taking it further...

**Activity:** Making suggestions to improve the quiz.

**Time:** 10 Minutes

*Follow your facilitator and complete the tasks below (put a mark if completed).  
Don't hesitate to ask if there is something you are not sure of.*

TASK	DONE?
<p><b>“Further ideas”</b></p> <ul style="list-style-type: none"> <li>What are some drawbacks of this app?</li> <li>How could you improve them?</li> <li>What functionality would you add/remove?</li> <li>Would you change the interface design?</li> <li>...</li> </ul>	
<p><b>Discuss your ideas/suggestion in the class.</b></p> <p><b>Save a new copy of your application and implement the changes.</b></p>	