Worksheet 1

Google Account & Connecting to AppInventor

Activity: You will create a Google Account and use it to login to the AppInventor site.
Time: 15 Minutes

App Inventor was developed by Google and is now owned and developed by the Massachusetts Institute of Technology (MIT) and can be accessed through this website: http://appinventor.mit.edu/explore/.
You need three things to use App Inventor:

- *A computer*—Windows, Macintosh, or GNU/Linux.
- *An internet connection and browser*—Chrome, Firefox, or Safari. (Internet Explorer support is planned for the future.)
- *A Google account*—Free, and available at https://accounts.google.com/signup. Note that to set up your own account, you have to be age 13 or older in most countries. If you're under 13, a parent can sign up for an account and work alongside you. (We know—the kids will teach the grownups!)
- Android phone or tablet

(Source: Book "Hello App Inventor!" Beer P., Simmons C., Publications *Manning Shelter Island*)

TASK	DONE?
Google account Should you already have a Google Account, consider helping out your fellow students who don't. Otherwise, open a **browser** and type in https://accounts.google.com/SignUp .	
• **Fill in** the required information.	
• You should also have an **active phone number** so as to verify your account.	
• Write down your **username** and **password** for future reference.	
Connecting to AppInventor • In the address bar of your browser type http://ai2.appinventor.mit.edu .	
• After this you will be presented with the environment of AppInventor.	

Worksheet 2 (part A)

AppInventor Environment

Activity: You will be introduced to the main parts of AppInventor.
Time: 10 Minutes

Sign in with your Google account at http://ai2.appinventor.mit.edu

In all the App Inventor apps you'll build, you'll use the same three steps with three different screens:

1. **Design** the app screen by using the *app Designer*.
2. **Tell** the app **what to do** by programming the *Blocks Editor*.
3. **Test** the program using your *phone* or *emulator*.

Designer

The AppInventor Designer lets you

a) *Create* a new project,

b) *Add* components and

c) *design* the look of the app.

Blocks Editor

- The Blocks Editor lets you *control* how the app works by using *programming blocks*. (You can toggle between Designer and Blocks as you program.)

Testing(*)

- Finally, you'll test the program on your phone.
- You can see if the app looks and works OK.

(*) Testing on your smartphone

- You will need an Android smartphone to download from Google Play the "MIT AI2 Companion"

Worksheet 2 (part B)

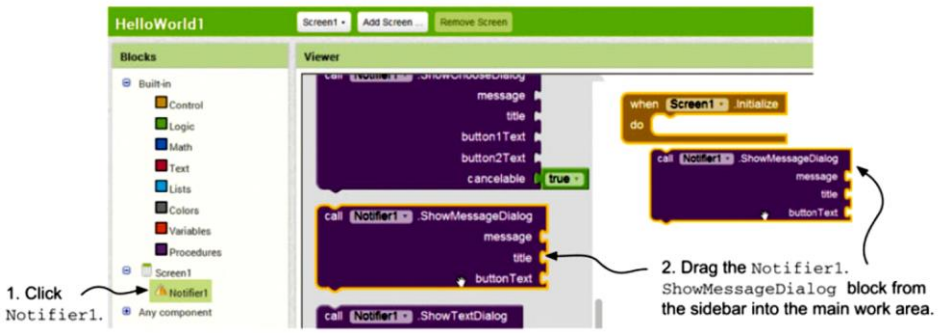
My first app: Hello World!

Activity: You will create an app that displays a pop-up message saying “Hello World!”
Time: 30 Minutes

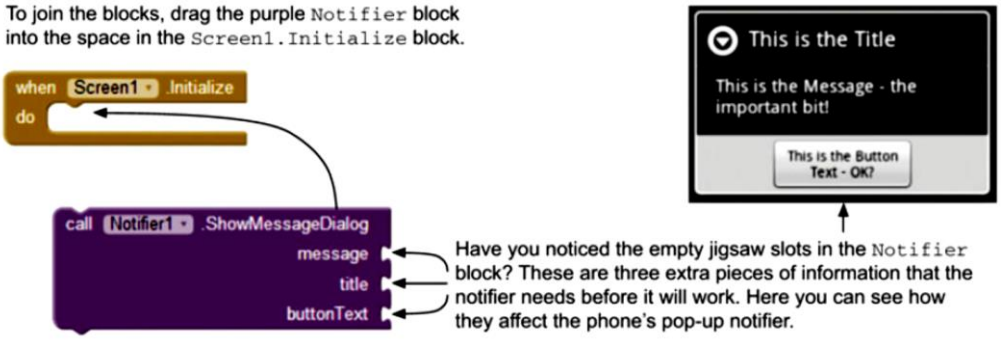
Follow your facilitator and complete the tasks below (put a mark if completed).
Don’t hesitate to ask if there is something you are not sure of.

TASK	DONE?
Starting a new project 1. From the menu click “Project” and then choose “Start New Project”. 2. Enter the project name, `HelloWorld`, and then click OK.	
TIP: • No spaces are allowed in project names or component names. One way to separate words is to use *camel case*, i.e. capital letters to indicate the start of each word. • App Inventor projects are automatically saved every few seconds as you work on them.	
Adding a Notifier component to the project 	

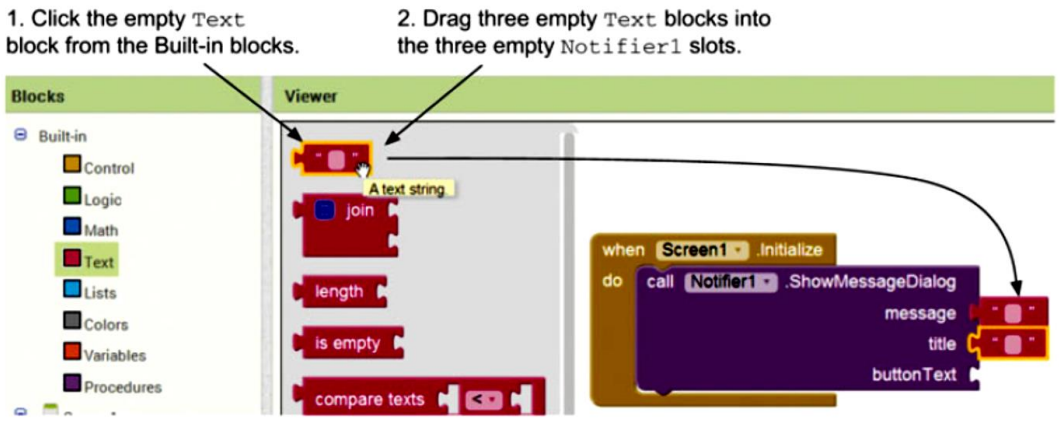
Writing the program using blocks

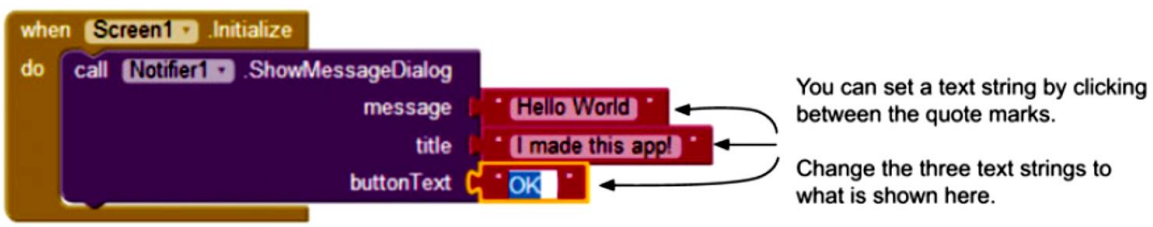


Now you join the blocks



The message, title, and button text that the notifier needs are all pieces of text—in programming, we call them *text strings*. To make text strings, you use a Built-in Text block.



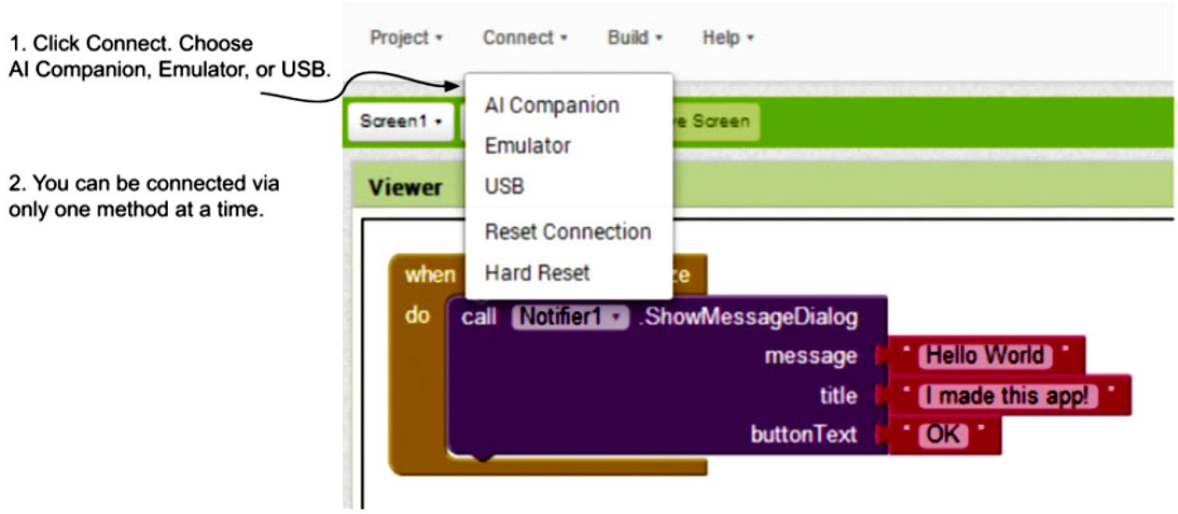


TIP:

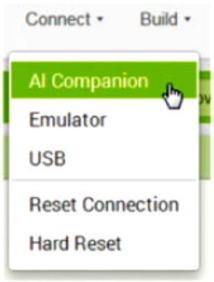
Before testing the app you should download the "MIT AI2 Companion" from Google Play.

Testing the app

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



- Connect your smartphone on the Wi-Fi network.
- Choose AI Companion. A code will appear on your computer screen. You can enter or scan this code into your phone by running the AI Companion phone app.



1. Choose AI Companion from the Connect menu.

2. A unique app code appears in both QR and text form.

3. On your phone, start the MIT AI2 Companion app.

4. 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.

(Source: Book "Hello App Inventor!" Beer P., Simmons C., Publications *Manning Shelter Island*)

Worksheet 2 (part C)

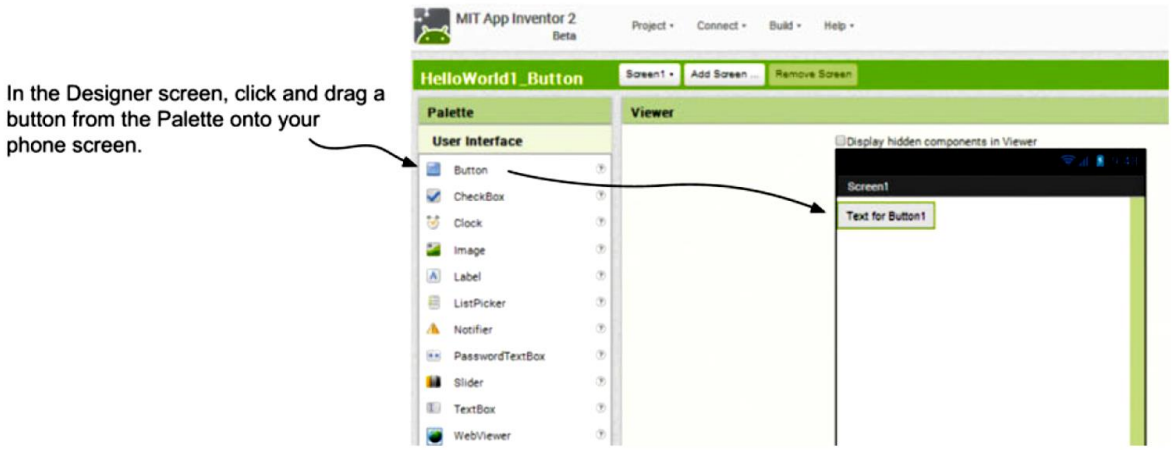
Adding functionality: Hello World! App, version 2

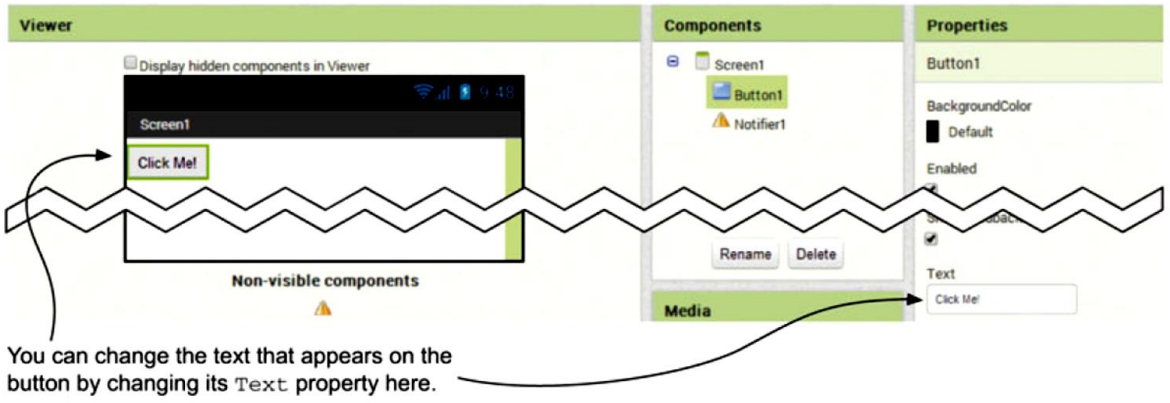
Activity: You will add a button to a new copy of your app.
Time: 15 Minutes

The problem in the Hello World! App is that the `Screen1.Initialize` event handler you use to trigger the app only happens once: when the app first runs.

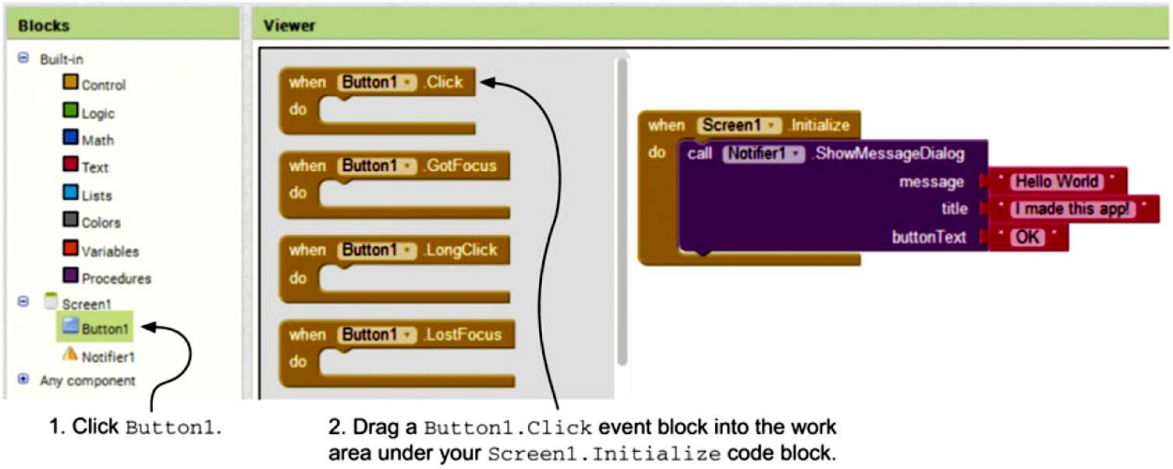
It would be better to have an event like a *button press* that the user can touch to trigger the event handler whenever they want to see the message.

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.

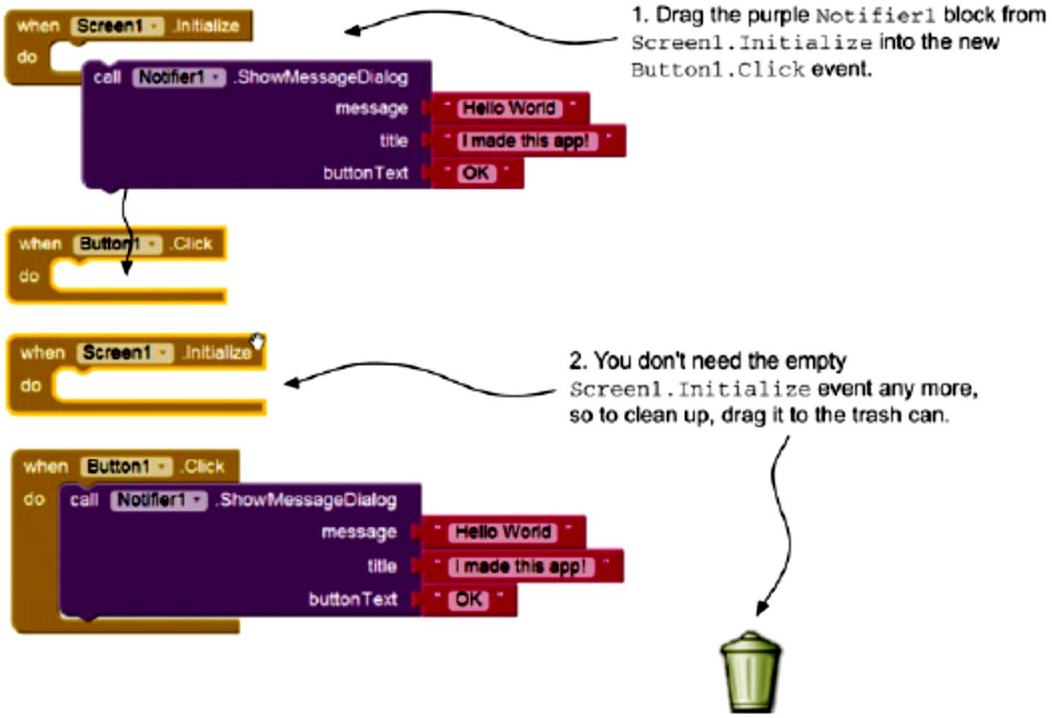
TASK	DONE?
1. Saving a new copy of Hello World! You call the new project `HelloWorld1_Button` so that when you look at the list of projects, you know what makes this version different from any others. Giving items sensible names will help you later when things get more complicated and you've created lots of different projects. 1. Menu Project → Save As… 2. Call your new project `HelloWorld1_button` 3. Click OK.	
2. Adding a Button component  You need to tell the user what to do with the button. Change the button to say `Click Me!`	



3. Programming the blocks



Now drag the **Notifier** block's code from `Screen1.Initialize` into `Button1.Click`:



4. Testing your app Connect your smartphone or tablet by choosing from the Connect menu “AI Companion” at the top of your screen.	
Taking it further 1. Add a new button and notifier to your app. Make the notifier say “Goodbye World” if the user clicks the second button. 2. Try changing the color properties of **Screen1** and **Button1**. Also change the **Font** and **Size** properties of `Button1`.	
Don’t forget to Sign out from AppInventor once you’re finished with your work.	

(Source: Book “Hello App Inventor!” Beer P., Simmons C., Publications *Manning Shelter Island*)

Worksheet 3

Designing the User Interface (UI)

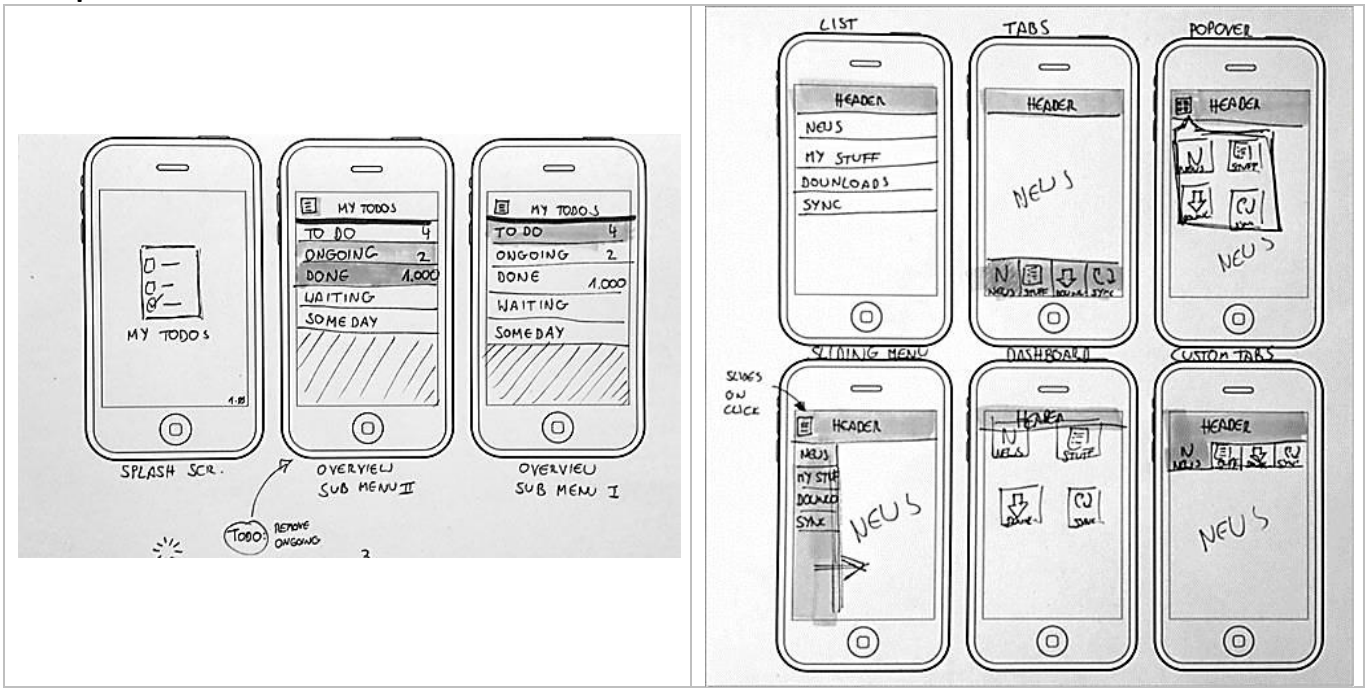
Activity: You will design drafts of the Quiz User Interface.
Time: 30 Minutes

The User Interface (UI) is about

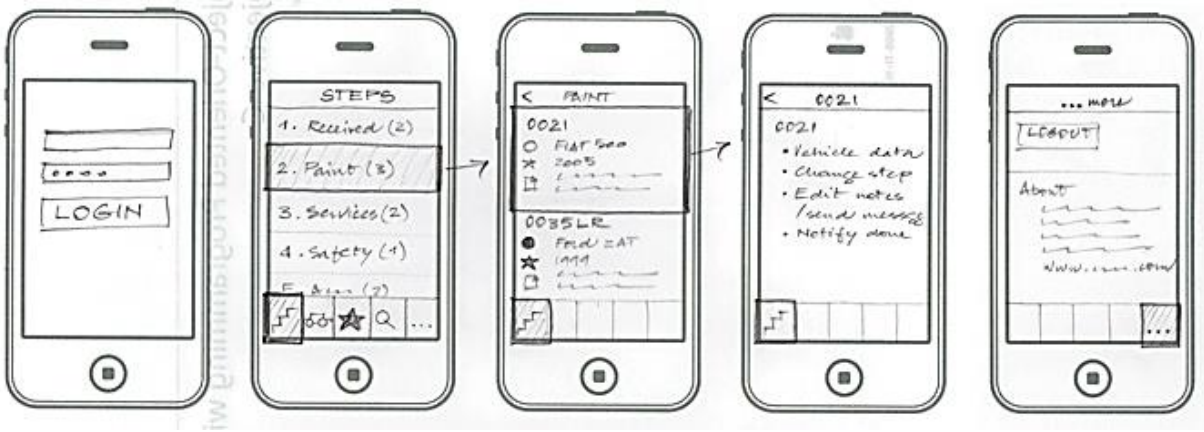
- How the app looks – graphic design, typography (fonts), and color
- How people tell the app what they want to do
- How the app gives information back to the user through the screen, speakers, or *haptic* feedback (buzzing the phone's little motor)

(Source: Book "Hello App Inventor!" Beer P., Simmons C., Publications *Manning Shelter Island*)

Examples



(Source: https://www.smashingmagazine.com/2013/06/sketching-for-better-mobile-experiences/)



(Source: http://lrcommunicationdesign.com/RapidRecon-web-application-design-example.html)

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.

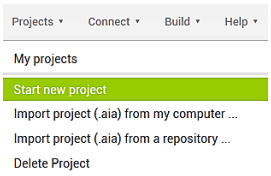
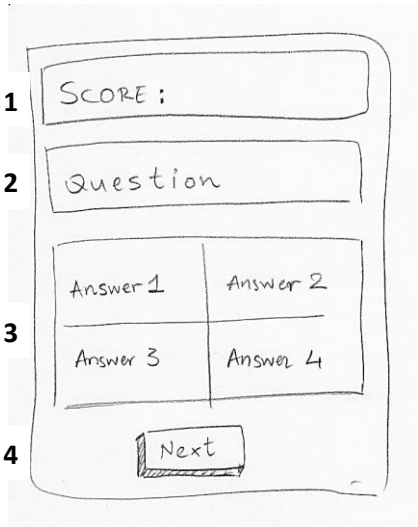
TASK	DONE?
Assigning Groups • You will be assigned in intercultural-mixed groups. • Think of a name for your team. • Choose who will present your work.	
User Interface of the app • How should the first screen of the Quiz app look like? • What functions should it have? • Brainstorm your ideas inspired from other smartphone applications. • Make drafts on the template provided. Ask for more copies if you need.	
Present your results • Present your ideas to the other group members. • Explain your thoughts.	

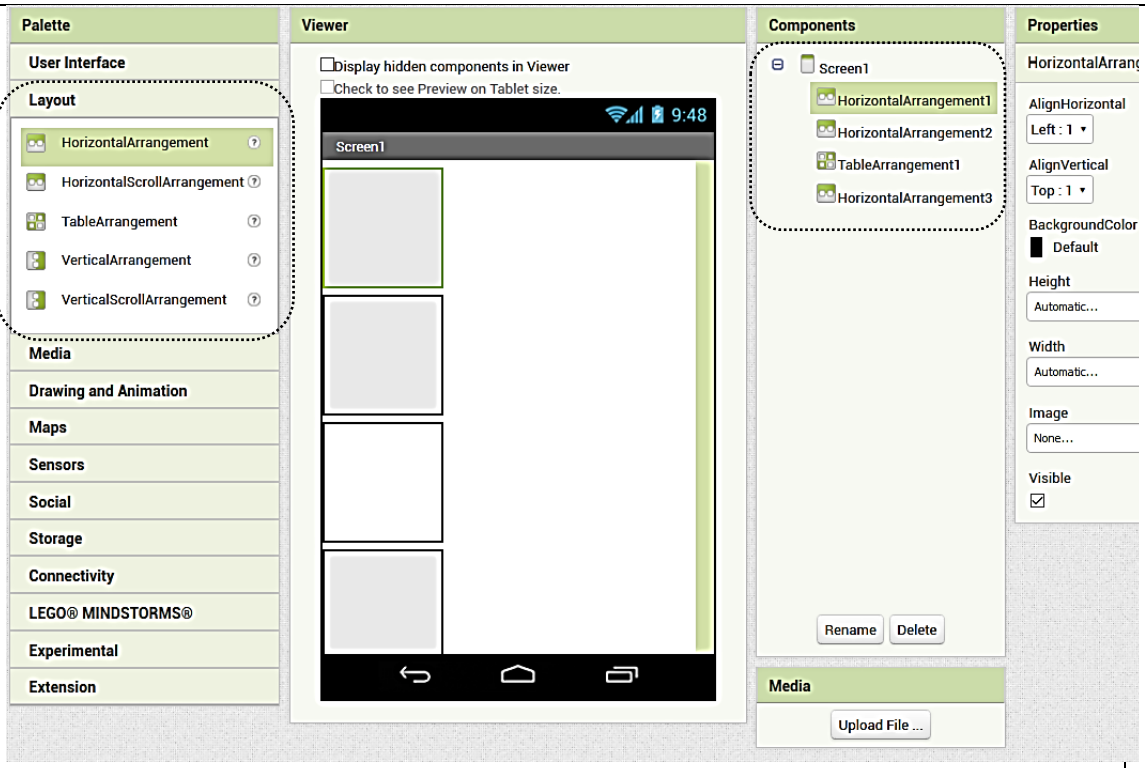
Worksheet 4 (Part A)

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

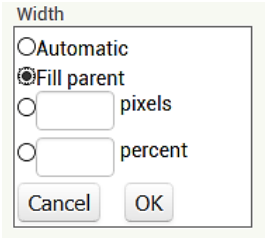
Follow your facilitator and complete the tasks below (put a mark if completed).
Don't hesitate to ask if there is something you are not sure of.

TASK	DONE?
Assigning Teams • To accomplish this task you have to team up with your host/guest fellow student.	
Connecting to AppInventor • Open a browser, e.g. Firefox, Chrome, MS Edge, Safari. • In the address bar of your browser type http://ai2.appinventor.mit.edu . • Sign in with your Google Account. • After this you're presented with the AppInventor environment.	
Starting a new project 1. From the menu click "Projects" and then choose "Start New Project". 2. Enter the project name, **`SimpleQuiz`**, and then click OK. 	
Designing the interface • Make a simple draft of your Quiz interface on paper. *How do you want it to look like?* *What components should it include?* • We will use the "Layout" tools to arrange all the components on the screen (points 1, 2, 3 and 4). Choose and drag the components from the Palette category "Layout" in the following order: point 1: **`HorizontalArrangement`** point 2: **`HorizontalArrangement`** point 3: **`TableArrangement`** point 4: **`HorizontalArrangement`** 	



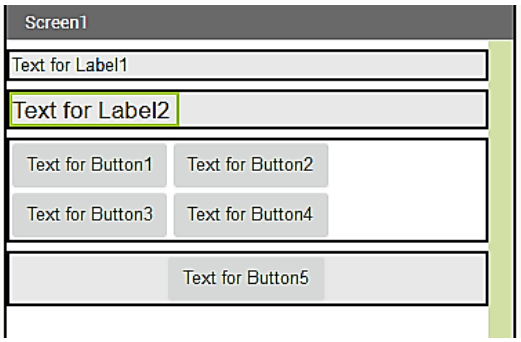
- For every component drawn on the screen change the "Width" to **`Fill Parent`**.

What do you notice?

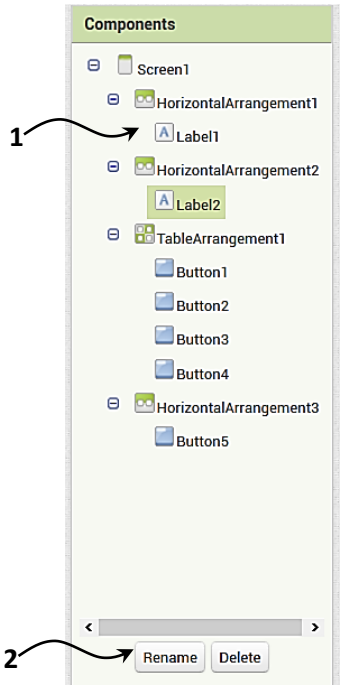


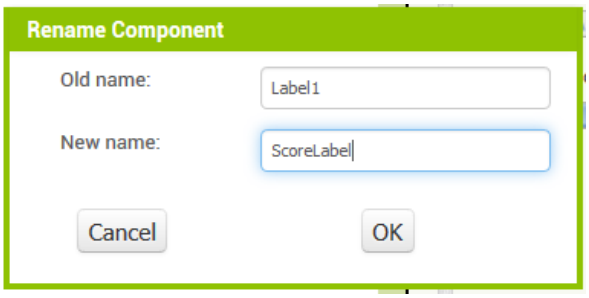
- We need "Labels" for text output, such as the *score* and the *question*.
  Then, we want the user to "click on" the answers while choosing, so we decide to draw buttons for our 4 possible answers.
  We also need a "Button" to click in order to proceed to the next question.

- Drag from the Palette the appropriate components to the screen, either **`Label`** or **`Button`**, as shown below.



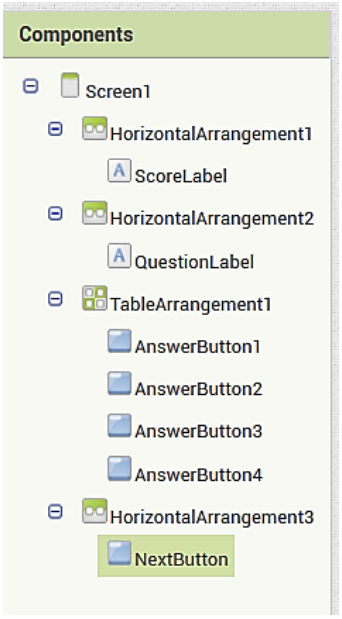
- Change the names of the labels and the buttons in "Components" by clicking first the name and then "Rename" as shown on the next page.





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

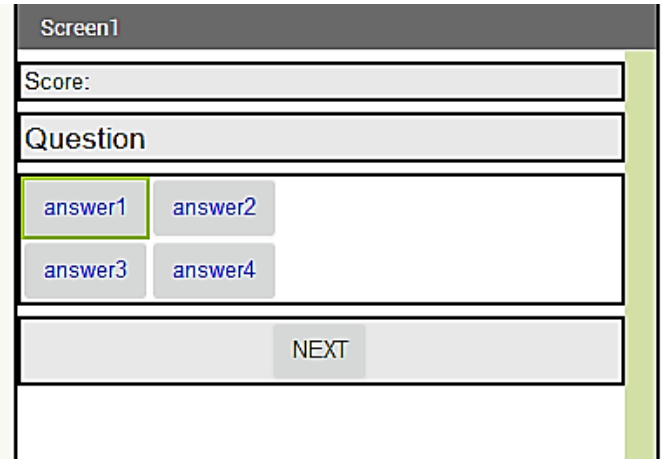


Changing Properties

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



Worksheet 4 (Part B)

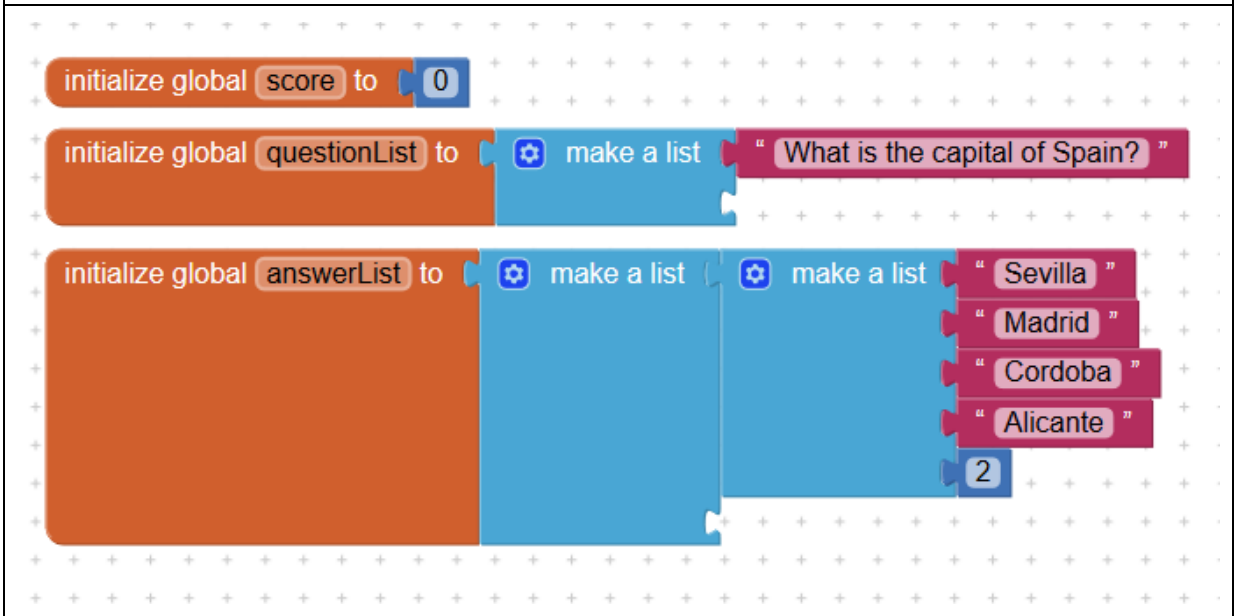
Creating a simple Quiz

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?
"What should the app do?" First, we have to think about how we want the app to "behave". How should the components interact? For example, • When the screen initializes (the app starts) the first question and 4 possible answers should be shown. • Then the user clicks on an answer. • The app evaluates if it's correct and • …gives feedback by changing the color of the correct answer button to GREEN • Maybe all the other buttons should be deactivated to prevent the user on trying different choices. • If the answer is correct the score should be updated "+1". Finally, the user can move to the next question.	
Blocks editor Switch to the BLOCKS editor (upper right corner). Create/Initialize 3 variables: the **`score`**, a **`questionList`** and an **`answerList`**  • When the app starts, we initialize our **`score`** to 0, • …create a list with one question "*What is the capital of Spain?*" • and create a second list within a list of possible answers.	

Follow the instructions as shown below.

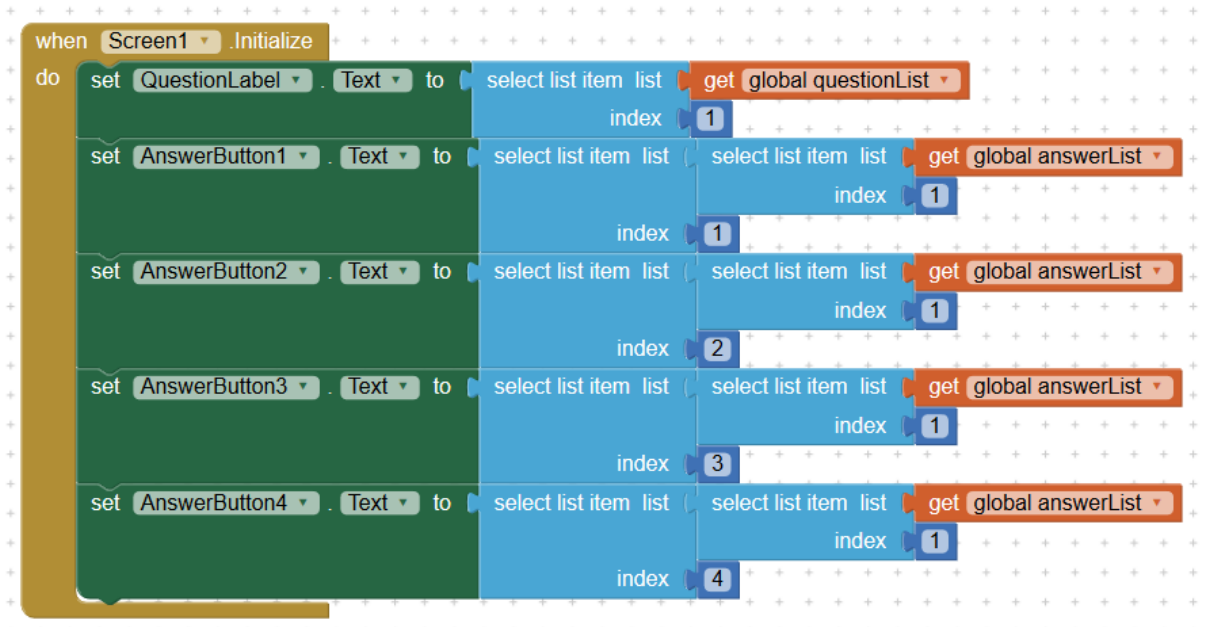


Why did we create the ***`answerList`*** *as "a list within a list"?*

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.



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 (1st in the list) you have to use the following programming block with the index number 1.

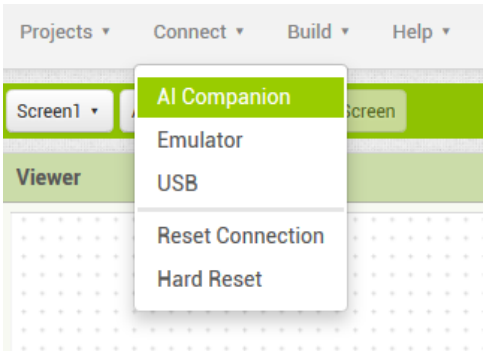
What is the index number for the item "Madrid"? How do you refer to it?

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.

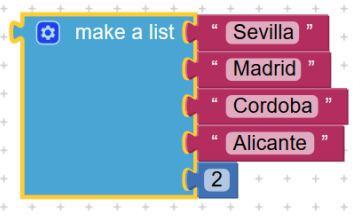
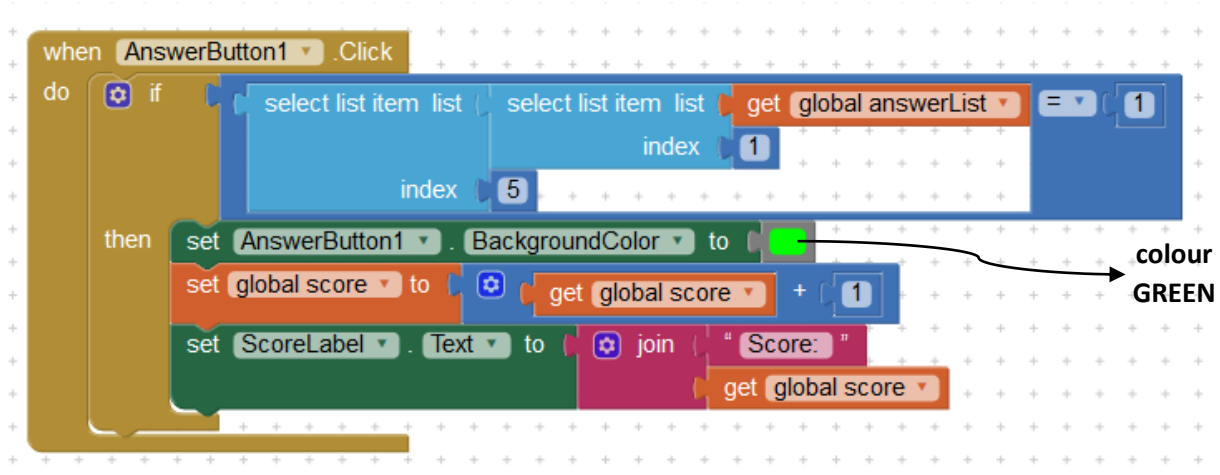
Do the buttons have some functionality?

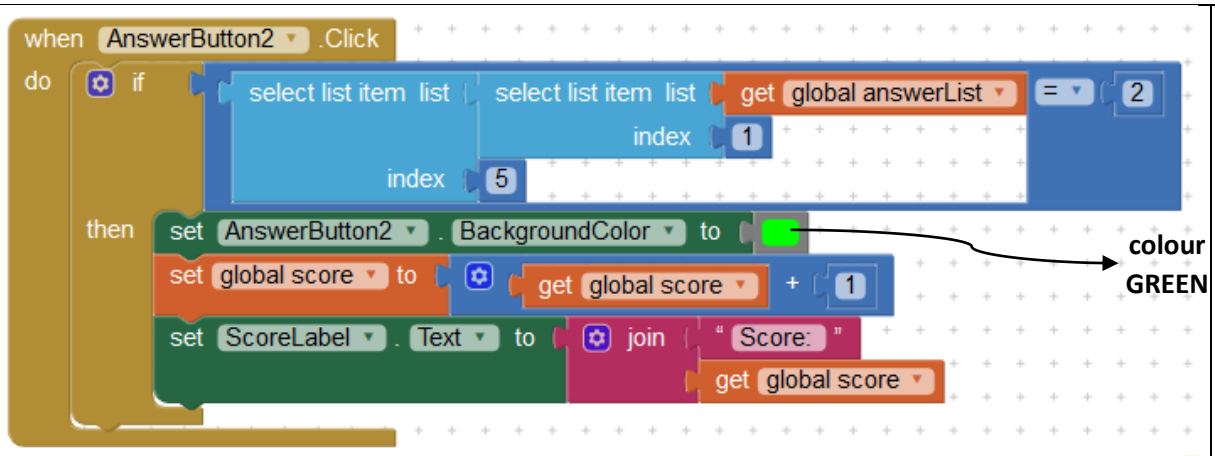
Worksheet 4 (Part C)

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?
"What should the buttons do?" If the user clicks on an Answer button, then the answer should be evaluated if it's correct. The correct answer is given by the number (in this example 2) in the list of possible answers.  • If the user clicks on the correct Answer button, ○ then **a)** it should change its background to green and **b)** update the score to +1. • If the user clicks the wrong button, then do nothing.	
Follow the instructions as shown below	
 	



Repeat the above for the remaining two (2) AnswerButtons.

TIP: To save time Right Click on the outer block and duplicate it.

Important: Make the necessary changes.

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.

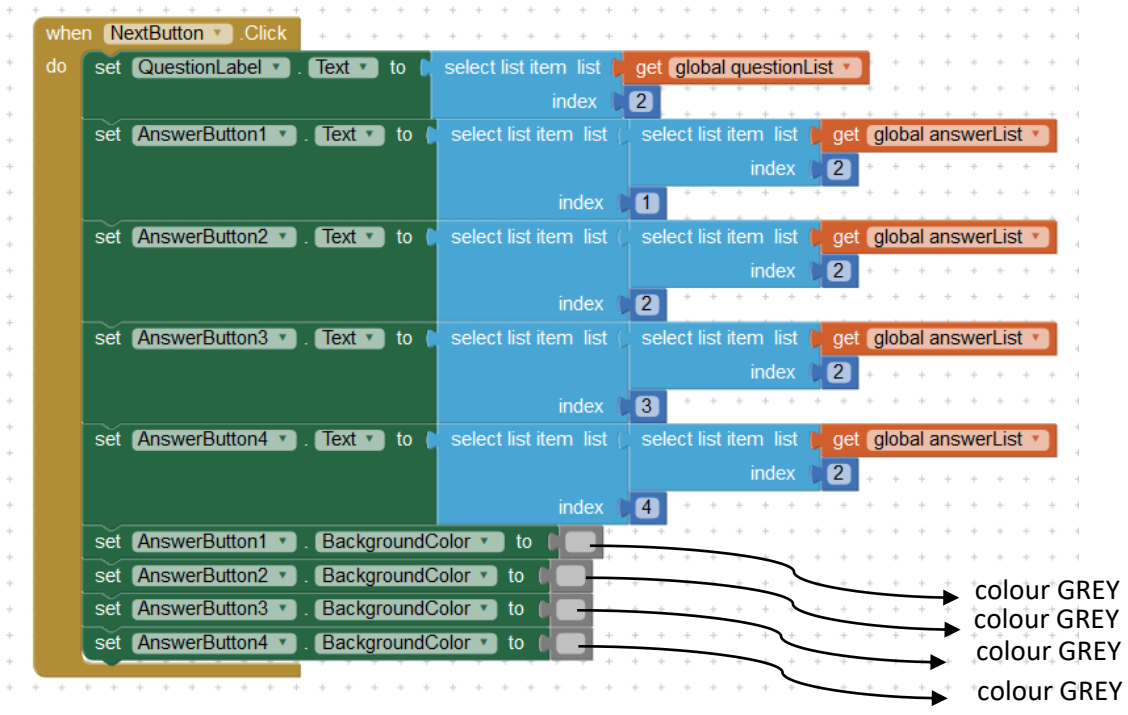
TASK	DONE?
 **"Think of a new question"** Write down your question and 4 possible answers.	
Following the previous instructions (as in Worksheet 4 part B) to add your question and answers in the programming blocks.	

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.

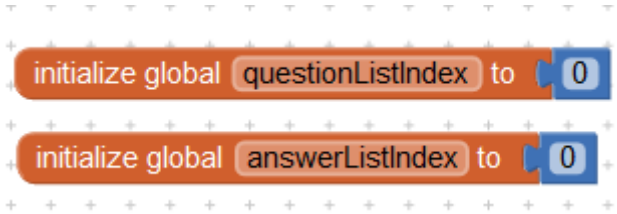
TASK	DONE?
"What actions should be taken after pressing the NEXT button?" To programme the next screen we have first to "initialize" certain components. 1. Set/Load the **`QuestionLabel`** to the new question 2. Set/Load the new answers into the **`AnswerButton`**'s. 3. Un-color the green button, i.e. all buttons should have the same grey colour.	
Follow the instructions as shown below.	
	
Test your application.	
Does your application function properly? Are they any problems? *How would you deal with them?*	

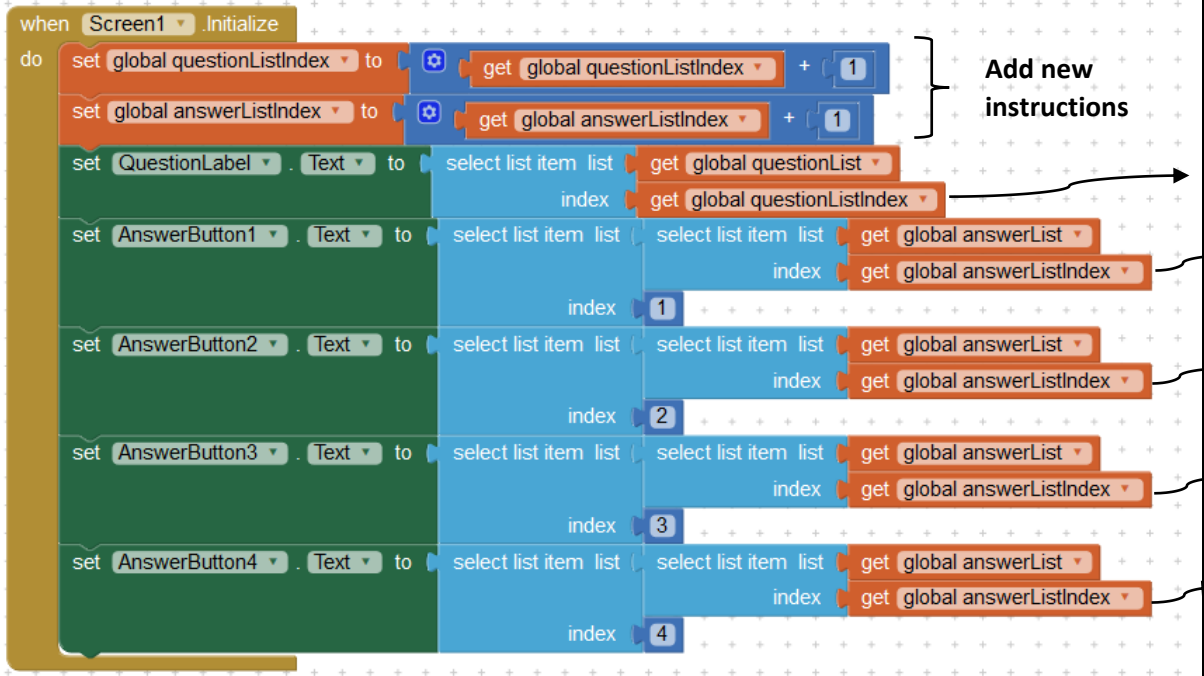
Worksheet 4 (Part F)

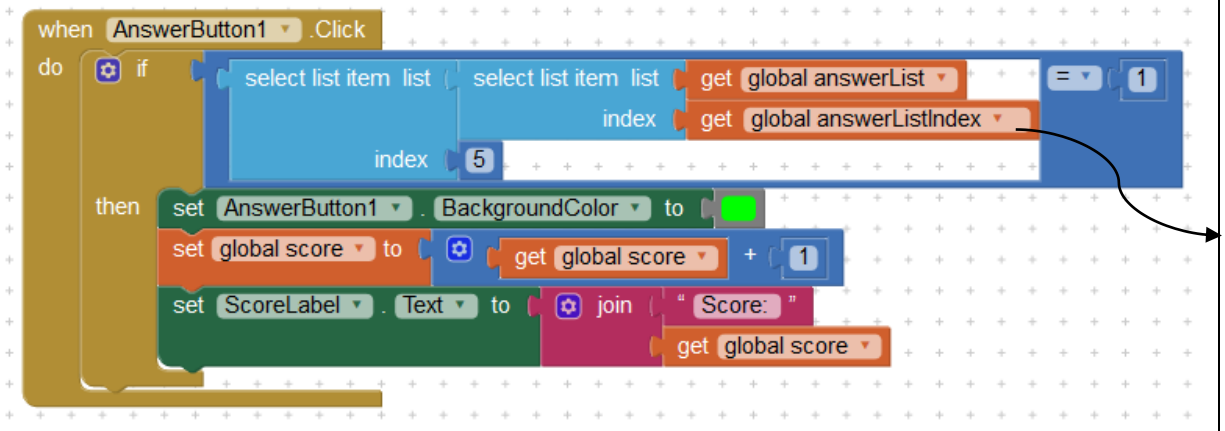
Creating a simple Quiz

Activity: Recognizing and resolving problems.
Time: 15 Minutes

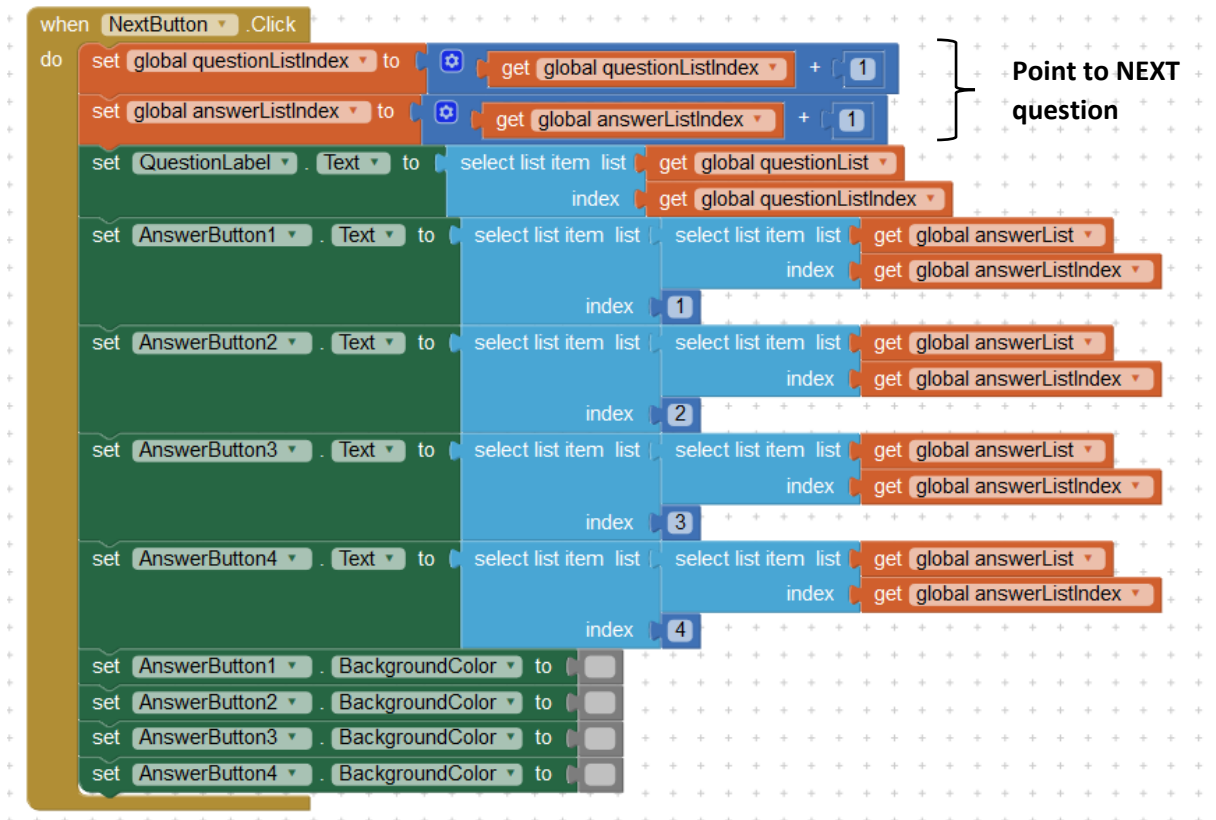
Follow your facilitator and complete the tasks below (put a mark if completed).
Don't hesitate to ask if there is something you are not sure of.

TASK	DONE?
"**Problem identification"** • We move to the next question but the the next set of answers isn't loaded. • The app doesn't highlight the correct answer (green button) when clicked. • Score is not incremented.	
"Problem resolving" • To resolve the above issues we have to make use of variables.	
Variables Variables are "containers" of information that can be manipulated. In AppInventor we use the built-in programming blocks "**`Initialize`**", "**`Get`**" and "**`Set`**" for this purpose. 	
We will create a new variable called "**`questionListIndex`**" to hold the index number of the questionList and a "**`answerListIndex`**" to hold the index number for the answerList. 	
We also have to <u>edit</u> the programming blocks to accommodate this change. **Follow the instructions as shown below.**	





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



Test your application.

Does your application function properly?

Worksheet 5

Taking it further…

Activity: Making suggestions to improve the quiz.
Time: 10 Minutes

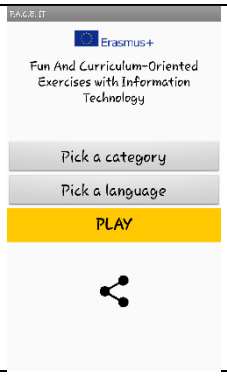
Follow your facilitator and complete the tasks below (put a mark if completed).
Don't hesitate to ask if there is something you are not sure of.

TASK	DONE?
"Further ideas" • What are some drawbacks of this app? • How could you improve them? • What functionality would you add/remove? • Would you change the interface design? • …	
Discuss your ideas/suggestion in the class. **Save a new copy of your application and implement the changes.**	

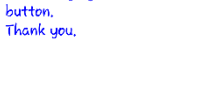
Explaining the concept

You will create the very first version (v1) of the “F.A.C.E. IT” Quiz app(lication).
The user will choose a *category* and a *language* to play the Quiz.
He/She will proceed through the questions by choosing an answer (correct or wrong).
At the end the final score will be shown.

- This will be the initial user interface.
- At the top there is an “Erasmus+” logo with the title of the Quiz application.
- Below, a list picker for categories and one for languages.
- …followed by a “Play” button to start the game.
- At the bottom, a Share Application icon.



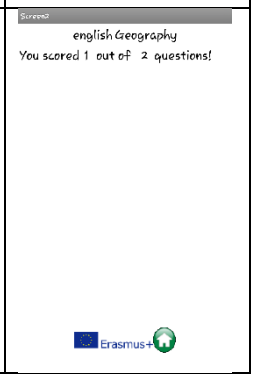
- Since we have to keep it simple the Quiz app will be limited to 1 category (Geography) and 1 language (English).
- Should someone pick a different set (category, language) a message should inform him/her about the only option available.



- The user has to choose the only working combination of “Geography” and “english”. After choosing a language an icon with the country flag will appear next to it.
- Pressing the “PLAY” button will start the game.

- The second screen will appear.
- At the top it will inform the user about the current *language* and *category*.
- The score will be set initially to zero (0).
- The question will be in blue color.
- The answers will be buttons to click on.
- At the bottom there will be an “Erasmus+” logo and a “Home” button to start over.

• After clicking on an answer,
  ○ …the correct answer will be highlighted in green,
  ○ …the score will be updated with +1 for correct answering or nothing and
  ○ …the “NEXT” button will appear at the bottom.
	

• We will provide <u>only</u> 2 questions • …to keep it as simple as possible.	
• At the end the final score will be displayed. • The user will have to click the “Home” button to start over again.	

Let’s start!

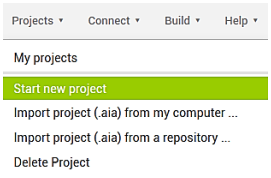
Worksheet 5 (Part A)

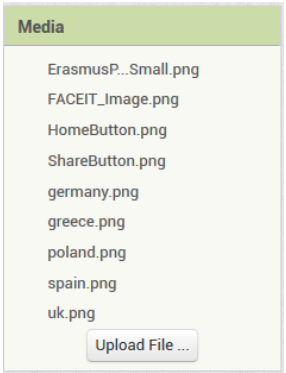
Creating the user interface of the Quiz app

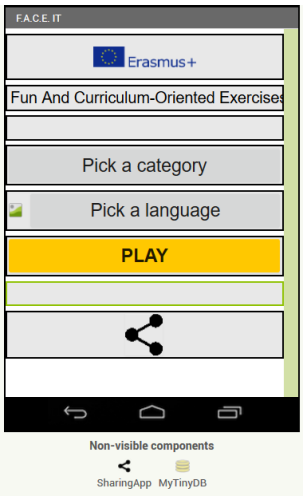
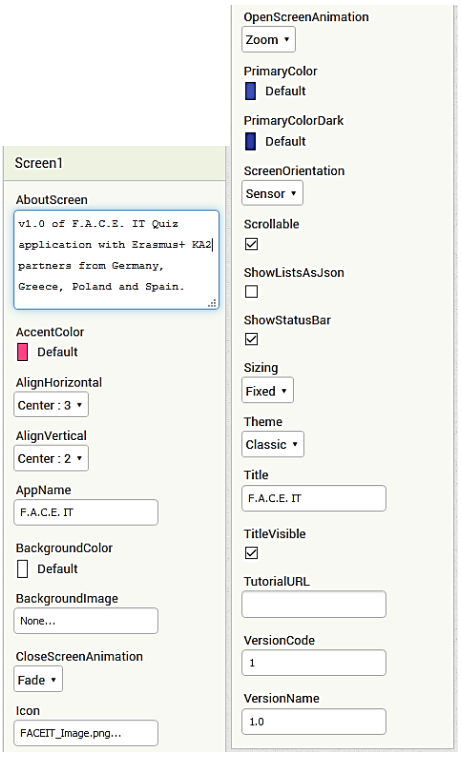
Activity: You will create a simple **user interface** for the Quiz app which will allow the user to choose the **category** of the questions and the **language**.

Time: **30** Minutes

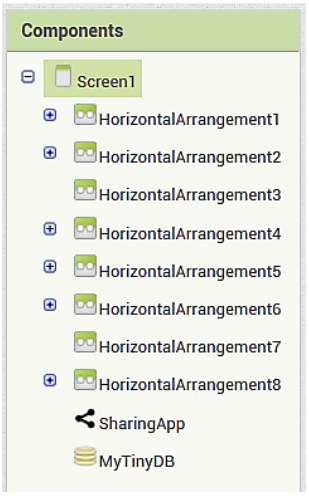
Follow your facilitator and complete the tasks below (put a mark if completed).
Don't hesitate to ask if there is something you are not sure of.

TASK	DONE?
Connecting to AppInventor • Open a browser, e.g. Firefox, Chrome, MS Edge, Safari. • In the address bar of your browser type http://ai2.appinventor.mit.edu . • Sign in with your Google Account. • After this you're presented with the AppInventor environment.	
Starting a new project • From the menu click "Projects" and then choose "Start New Project". • Enter the project name, **`FACE_IT_v1`**, and then click OK. 	

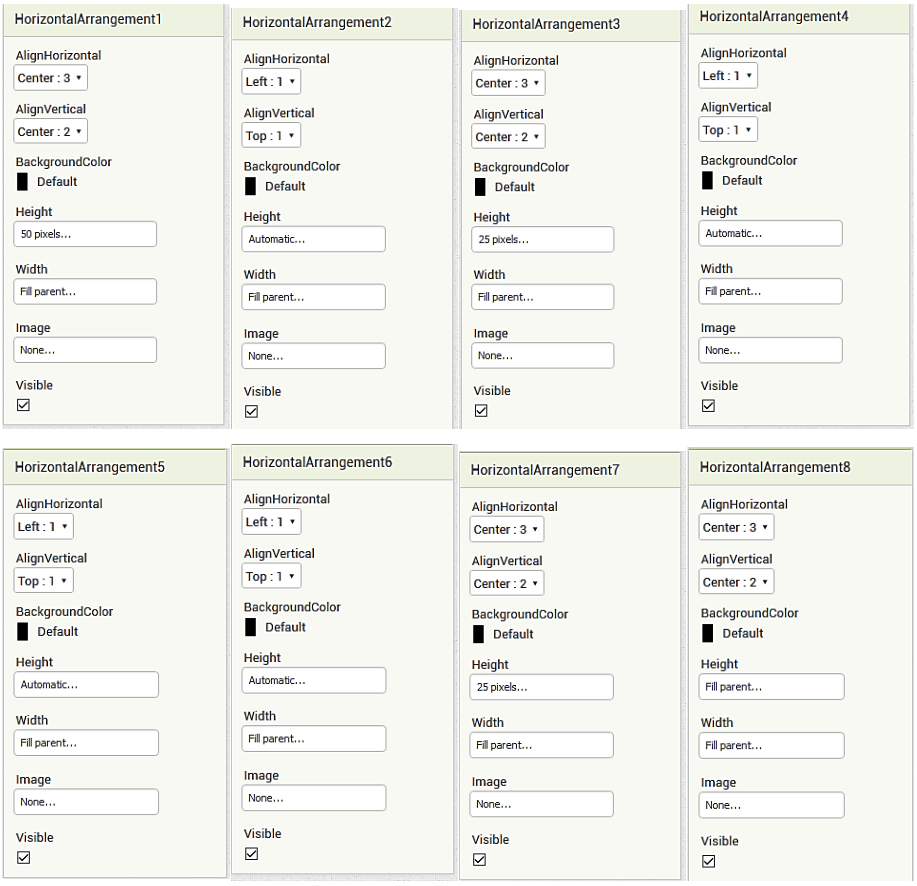
Uploading images to AppInventor
• You will need 9 pictures for this version of the app.
• The images are in a zipped file format located in the Twinspace Material folder.
  ○ Sign in to your Twinspace account.
  ○ Follow the path "Material → Files → DE-Workshops" and download the file "QuizAppImages.zip" or directly under http://twinspace.etwinning.net/files/collabspace/1/21/721/44721/files/b3f920b7.zip
  ○ After downloading unzip the files at your Desktop.
• Upload each one of the files to your AppInventor project.
NOTE: You cannot upload all files at once.
• After completing your Media section should look like this
 	

TASK	Screenshot
• This is a screenshot of the user interface of your **`Screen1`** which you will design.	
• Edit the **`Screen1`** properties as shown. **NOTE**: The screenshots are splitted in two halfs. AboutScreen: "v1.0 of F.A.C.E. IT Quiz application with Erasmus+ KA2 partners from Germany, Greece, Poland and Spain."	

- The interface consists of
  8 `HorizontalArrangements`,
  1 `SharingApp` and
  1 `TinyDB`.



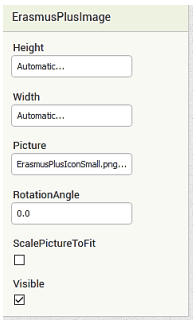
- Check and edit the properties of all **8 `HorizontalArrangements`** as shown.



HorizontalArrangement1

- From the Palette "User Interface", drag the **`Image`** component onto your **`HorizontalArrangement1`**.

- Rename it to **ErasmusPlusImage** and
- …edit the properties as shown:



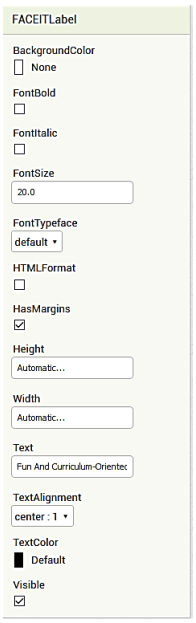
HorizontalArrangement2

- From the Palette "User Interface", drag the **`Label`** component onto your **`HorizontalArrangement2`**.

Fun And Curriculum-Oriented Exercises

- Rename it to **FACEITLabel** and
- …edit the properties as shown:

Text property is
"*Fun And Curriculum-Oriented Exercises with Information Technology*"

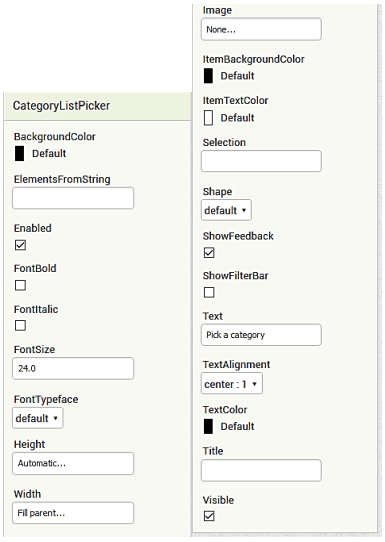


HorizontalArrangement4

- From the Palette "User Interface", drag the **`ListPicker`** component onto your **`HorizontalArrangement4`**.

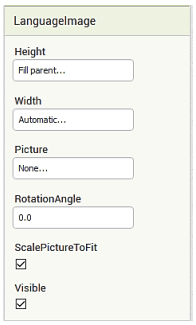
Pick a category

- Rename it to **CategoryListPicker** and
- …edit the properties as shown:

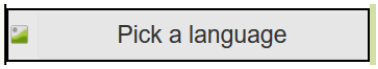


HorizontalArrangement5

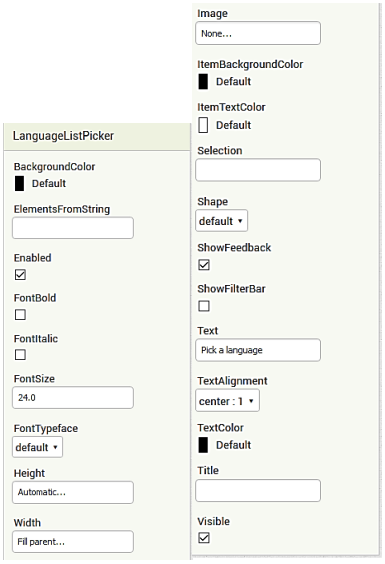
- From the Palette "User Interface", drag the **`Image`** component onto your **`HorizontalArrangement5`**.
- Rename the **`Image`** to **LanguageImage** and
- …edit the properties as shown.



- From the Palette "User Interface", drag the **`ListPicker`** component onto your **`HorizontalArrangement5`**.



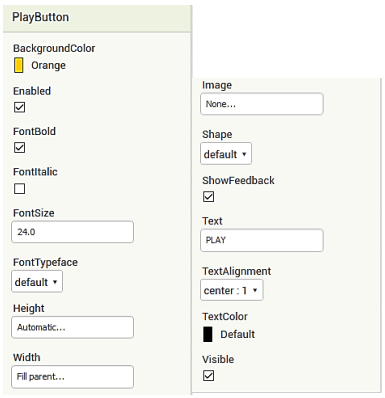
- Rename the **`ListPicker`** to **LanguageListPicker** and
- …edit the properties as shown.



HorizontalArrangement6

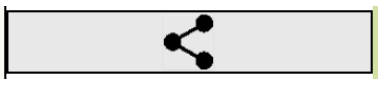
- From the Palette "User Interface", drag the **`Button`** component onto your **`HorizontalArrangement6`**.

- Rename the **`Button`** to **PlayButton** and
- …edit the properties as shown.

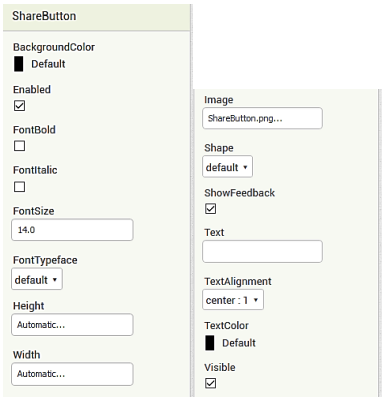


HorizontalArrangement8

- From the Palette "User Interface", drag the **`Button`** component onto your **`HorizontalArrangement8`**.

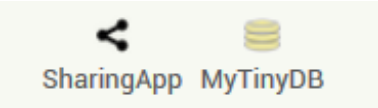


- Rename the **`Button`** to **ShareButton** and
- …edit the properties as shown.



Non-visible components

- From the Palette "Social" choose the component **`SharingApp`** and drag it to the interface.
- From the Palette "Storage" choose the component **`TinyDB`** and drag it to the interface. Rename to **`MyTinyDB`**.

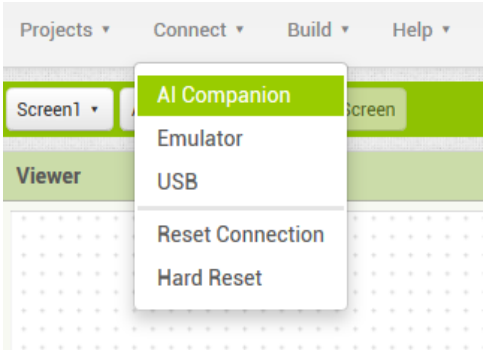


Testing the app

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.

Worksheet 5 (Part B)

Programming the user interface (`Screen1`)

Activity: You will program the components of the user interface in order to add interactivity to your application.
Time: **20** 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	Screenshot

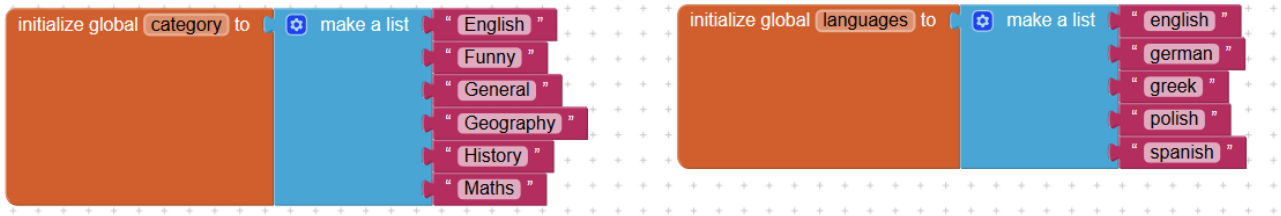
Blocks editor

Switch to the BLOCKS editor (upper right corner).

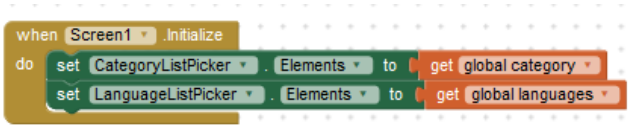
Initializing

We initialize two variables as lists

- **`category`** to accommodate a list with the choices "English", "Funny", "General", "Geography", "History", and "Maths" and
- **`language`** to accommodate a list with the choices "english", "german", "greek", "polish" and "spanish".

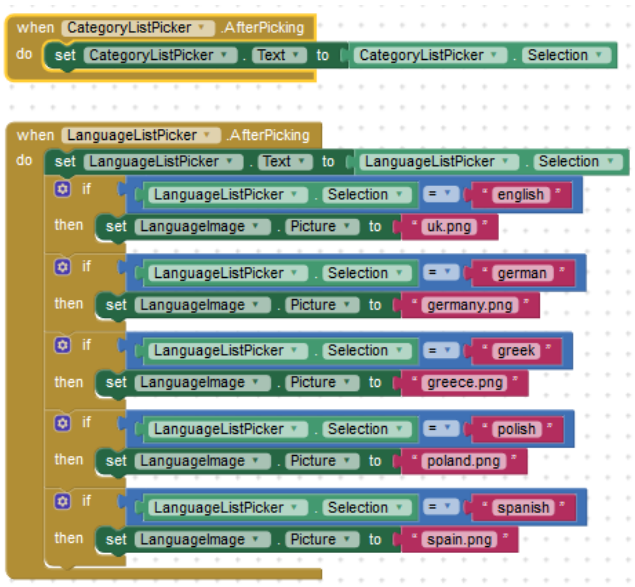


…and when **`Screen1`** is loaded both lists get their elements from their respective variables.



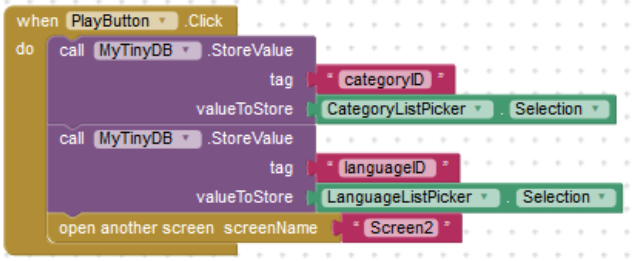
Picking elements from lists

- After the user picks a category we change the Text property of **`CategoryListPicker`** to reflect the user selection.
- Likewise, after picking a language we change the Text property of **`LanguageListPicker`** to reflect the user selection. Also, we set a picture of the respective country flag by changing the Picture property of **`LanguageImage`** as shown.



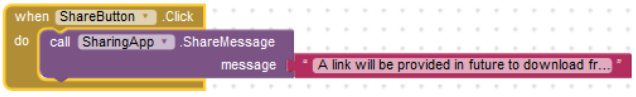
Playing

- The user has made a choice of category and language.
- Those values have to be passed on to a new screen to load the appropriate questions.
- For this purpose, we take advantage of the Database component **`TinyDB`** to share those values between two screens.



Sharing the application

- Last, we want to offer the opportunity to share the application through social media.
- At this point, we haven't yet any functional link to Google Play.
- That's why we'll show only a message with the text "*A link will be provided in future to download from Google Play.*"



Testing the app

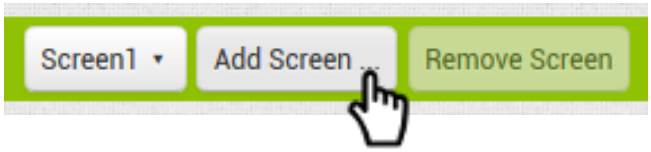
- Up until this point you've created the first screen (**`Screen1`**) and added functionality to its componets. Before proceeding with the next task you should test your app.

Worksheet 5 (Part C)

Creating the Question interface

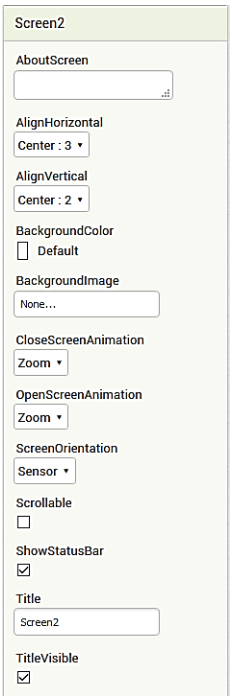
Activity: You will create a second screen for the interface of the questions.
Time: **30** Minutes

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.

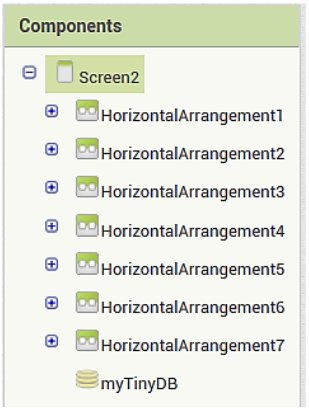
TASK	DONE?
Adding a Screen Click on the **`Add Screen`** button and add a new screen with the name **`Screen2`**. 	

TASK	Screenshot
• This is a screenshot of the interface of your **`Screen2`** which you will design.	

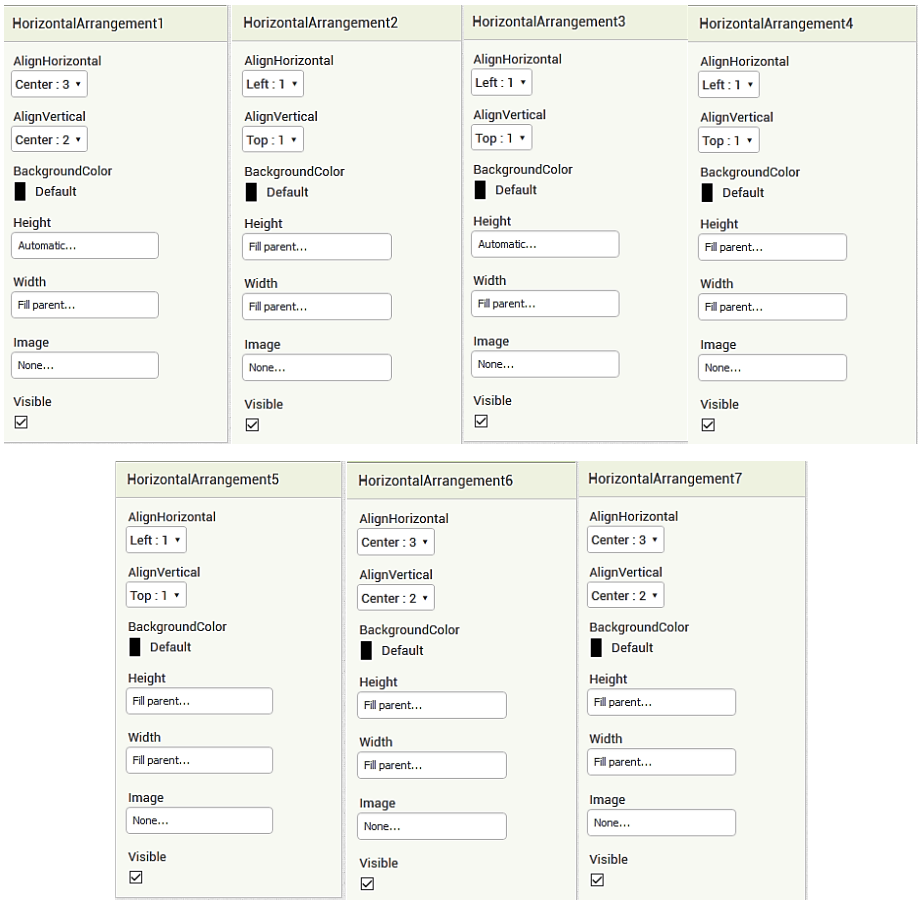
- Edit the **`Screen2`** properties as shown.



- The interface consists of **7 `HorizontalArrangements`** and **1 `TinyDB`**.

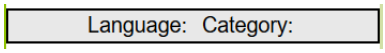


- Check and edit the properties of all **7 `HorizontalArrangements`** as shown.



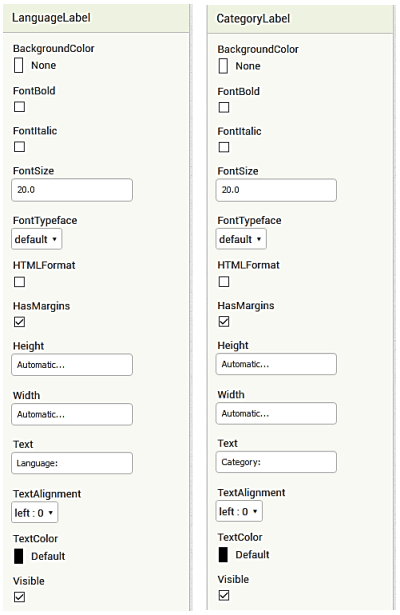
HorizontalArrangement1

- From the Palette "User Interface", drag two **`Label`** components onto your **`HorizontalArrangement1`**.



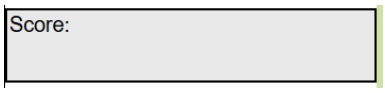
- Rename the first label to **LanguageLabel** and
- …edit the properties as shown.

- Rename the second label to **CategoryLabel** and
- …edit the properties as shown.

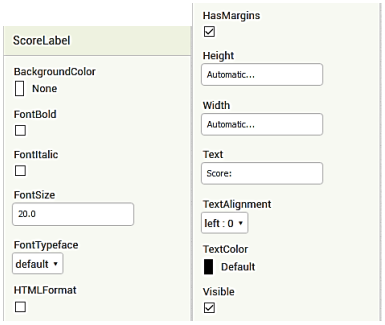


HorizontalArrangement2

- From the Palette "User Interface", drag a **`Label`** component onto your **`HorizontalArrangement2`**.



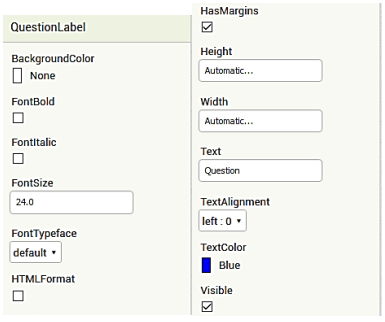
- Rename the label to **ScoreLabel** and
- …edit the properties as shown.



HorizontalArrangement3

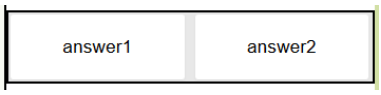
- From the Palette "User Interface", drag a **`Label`** component onto your **`HorizontalArrangement3`**.

- Rename the label to **QuestionLabel** and
- …edit the properties as shown.

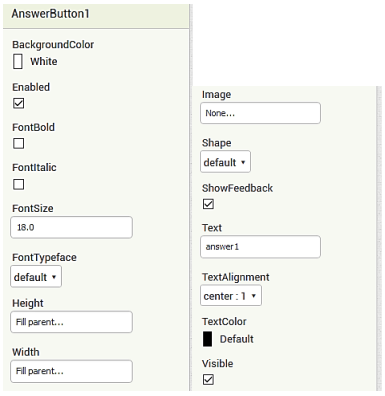


HorizontalArrangement4

- From the Palette "User Interface", drag two **`Button`** components onto your **`HorizontalArrangement4`**.

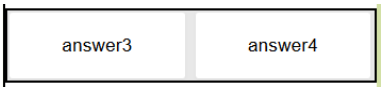


- Rename the first button to **AnswerButton1** and
- …the second button to **AnswerButton2**.
- Edit the properties as shown.

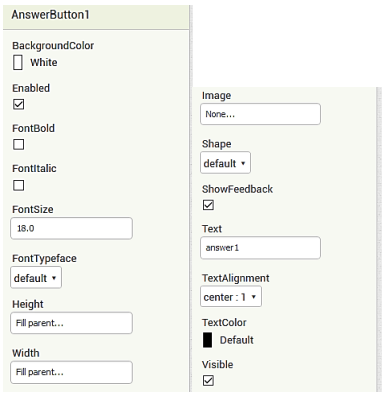


HorizontalArrangement5

- From the Palette "User Interface", drag two **`Button`** components onto your **`HorizontalArrangement5`**.



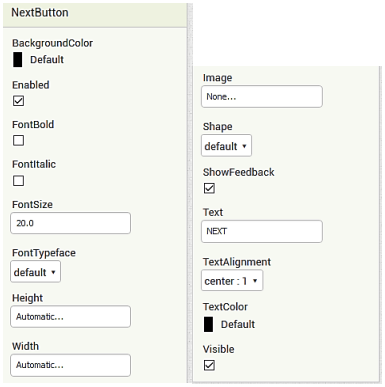
- Rename the first button to **AnswerButton3** and
- …the second button to **AnswerButton4**.
- Edit the properties as shown.



HorizontalArrangement6

- From the Palette "User Interface", drag a **`Button`** component onto your **`HorizontalArrangement6`**.

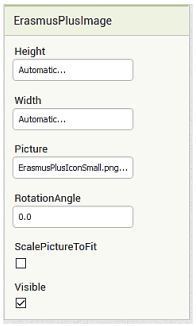
- Rename the button to **NextButton** and
- …edit the properties as shown.



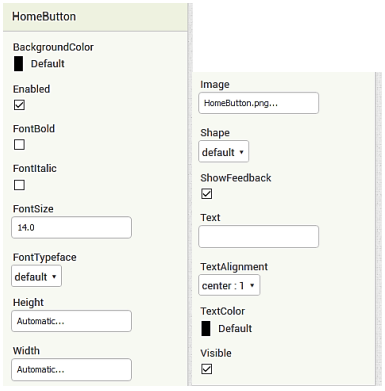
HorizontalArrangement7

- From the Palette "User Interface", drag an **`Image`** and a **`Button`** component onto your **`HorizontalArrangement7`**.

- Rename the image to **ErasmusPlusImage** and
- …edit the properties as shown.

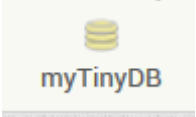


- Rename the button to **HomeButton** and
- …edit the properties as shown.



Non-visible components

- From the Palette "Storage" choose the component **`TinyDB`** and drag it to the interface. Rename to **`MyTinyDB`**.



Testing the app

- Up until this point you've created successfully the design of the second screen (**`Screen2`**). Before proceeding with the next task you should test your app.

Worksheet 5 (Part D)

Programming the Question interface (`Screen2`)

Activity: You will program the components of the Question interface in order to pick the right list of user's choice of category and language. Then to proceed through the questions, to evaluate the user's answer, to update the score and finally to show a message of the final score.

Time: **45** 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	Screenshot

Blocks editor

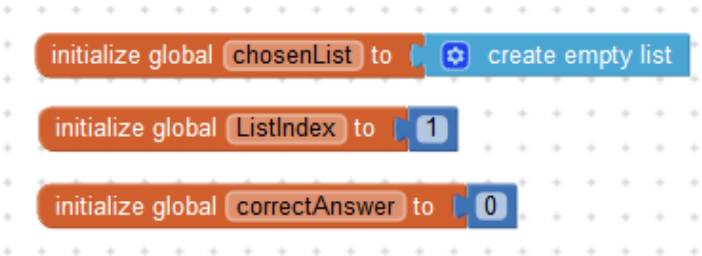
Switch to the BLOCKS editor (upper right corner).

Initializing

We will use a set of variables which have to be initialized with a proper value before using.

- Variables **`category`** and **`language`** will hold the shared values of the user's choice of category and language from **`Screen1`**. Initially they will hold an empty text string.

- The variable **`chosenList`** will be used to load the appropriate Question-Answers of the user's choice. Initially it will hold an empty list.
- The variable **`ListIndex`** will point to the elements in the list and the variable **`correctAnswer`** will hold the correct answer for every question.



- The variable **`score`** will hold the current score of the user. Initially it is set to **0**.
- The variable **`userAnswer`** will be used to compare user's choice with the **`correctAnswer`**. Both of them are initially set to **0**.

Initializing the Question interface

- The Question interface (**`Screen2`**) gets the values of the **`category`** and the **`language`** from the shared Database **`myTinyDB`**.
- Also, sets the labels of **`CategoryLabel`** and **`LanguageLabel`** respectively to inform the user during the game.

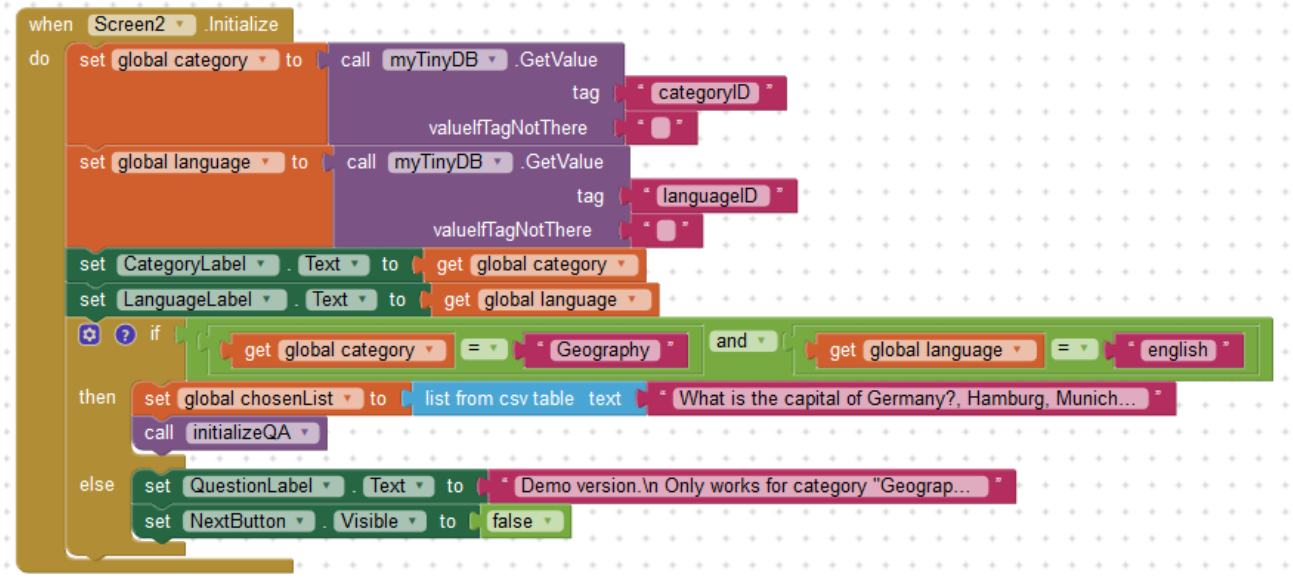
  IMPORTANT: In order to keep it simple we will create a quiz with only 2 questions and for 1 category in 1 language. For this purpose we have chosen *Geography* and *english*.

- If the criteria of "Geography" and "english" are met, the **`chosenList`** is loaded with the appropriate list from a csv (comma separated value) table.
- You have to fill the data of the csv table in the text field as follows
  What is the capital of Germany?, Hamburg, Munich, Berlin, Hannover, 3\n
  Which is the largest river in Germany?, Elbe, Danube, Rhine, Amazon, 2\n

  Pay attention to the punctuation, such as the comma (**,**) and the question mark (**?**).
  Each question ends with a new line character "**\n**".

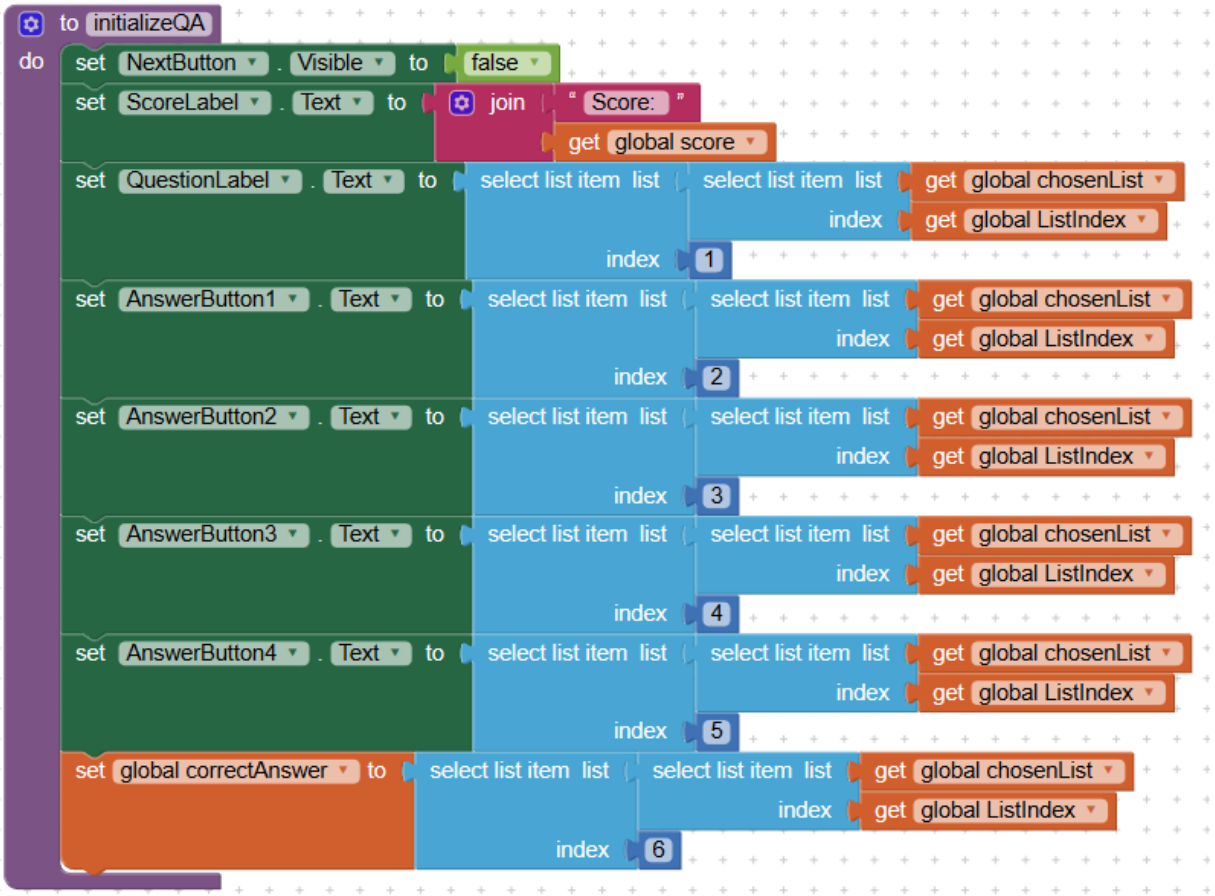
  IMPORTANT: At this point the procedure **`initializeQA`** must be called. Since you haven't created it yet you will add this programming block later on once you've built it.

- If the criteria are not met, a message will inform the user to choose "Geography" and "english". The message will be
  Demo version.\n Only works for category "Geography" and language "english".\nPlease try again. Click Home button.\nThank you.

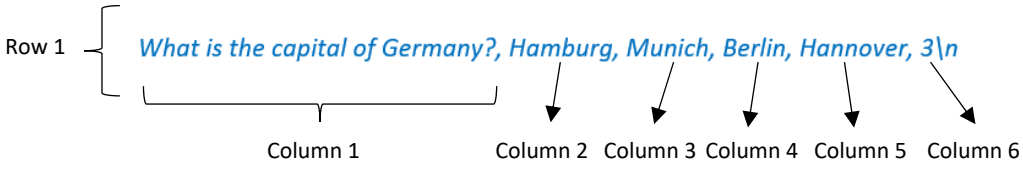


Procedure `initializeQA`

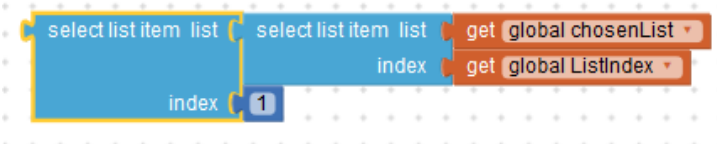
- This procedure will be called each time to set the labels of **`Screen2`** with the content of the next question, the possible answers, and the score respectively.
- In order to avoid an "empty" response from the user the **`NextButton`** is hidden (set to false). It will only be shown once the user makes a choice, i.e. clicks on an **`AnswerButton`**.



NOTE: We use a table for storing our questions, answers and an index to the correct answer. The table consists of rows and columns separated by commas. Each row ends with a new line character "\n".



Column1 holds the question. Columns 2 to 5 the four possible answers. Column 6 the number for the correct answer which for the above example is 3, i.e. "Berlin".

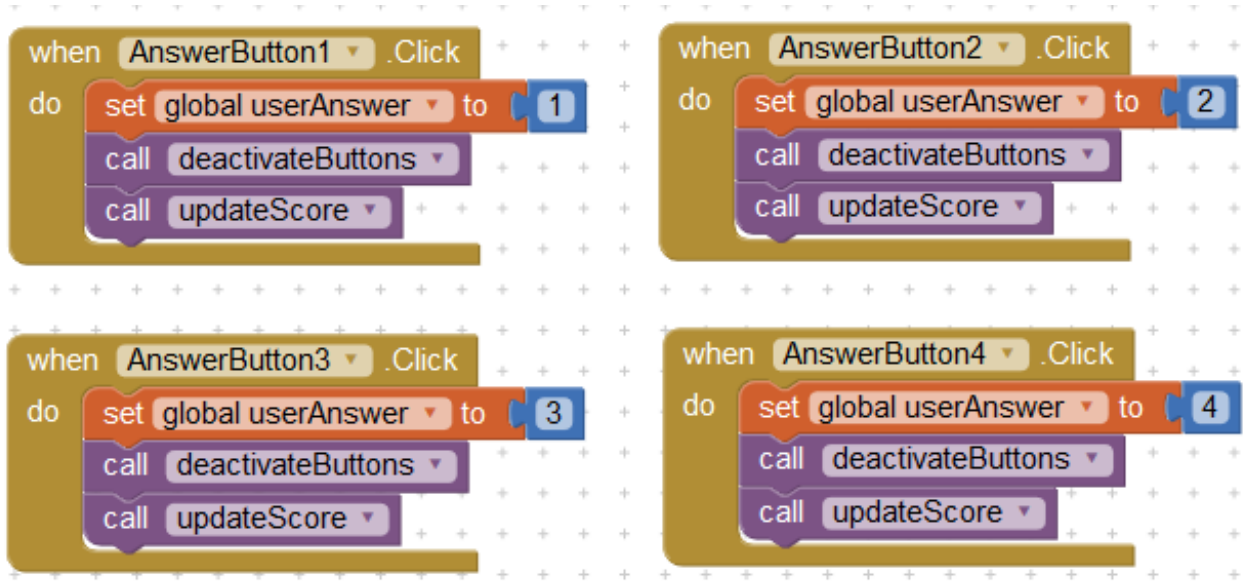


The above programming blocks translate to "*Choose from the current list* (variable chosenList) *and the row* (variable ListIndex) *the value of the first column* (number 1)", i.e. the question.

Adding functionality to the `AnswerButtonX`

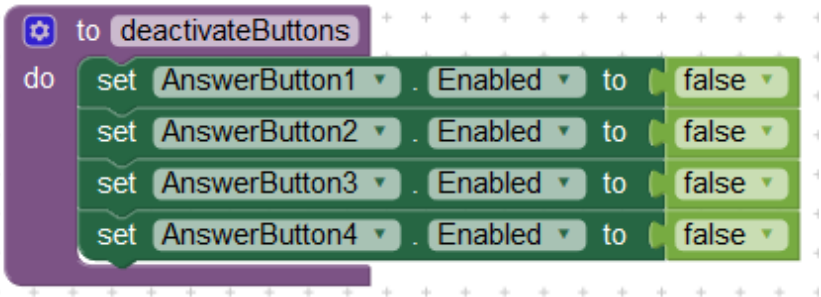
- Once the user clicks on an **`AnswerButton`** his/her choice is marked (**`userAnswer`** set to 1, 2, 3 or 4),
- …all the other buttons are deactivated (procedure **`deactivateButtons`**) to prevent the user from trying many times, and
- …the score is updated accordingly (procedure **`updateScore`**) with +1 if the user chose correctly.

  IMPORTANT: At this point the procedures **`deactivateButtons`** and **`updateScore`** must be called. Since you haven't created them yet you will add those programming block later on once you've built them.



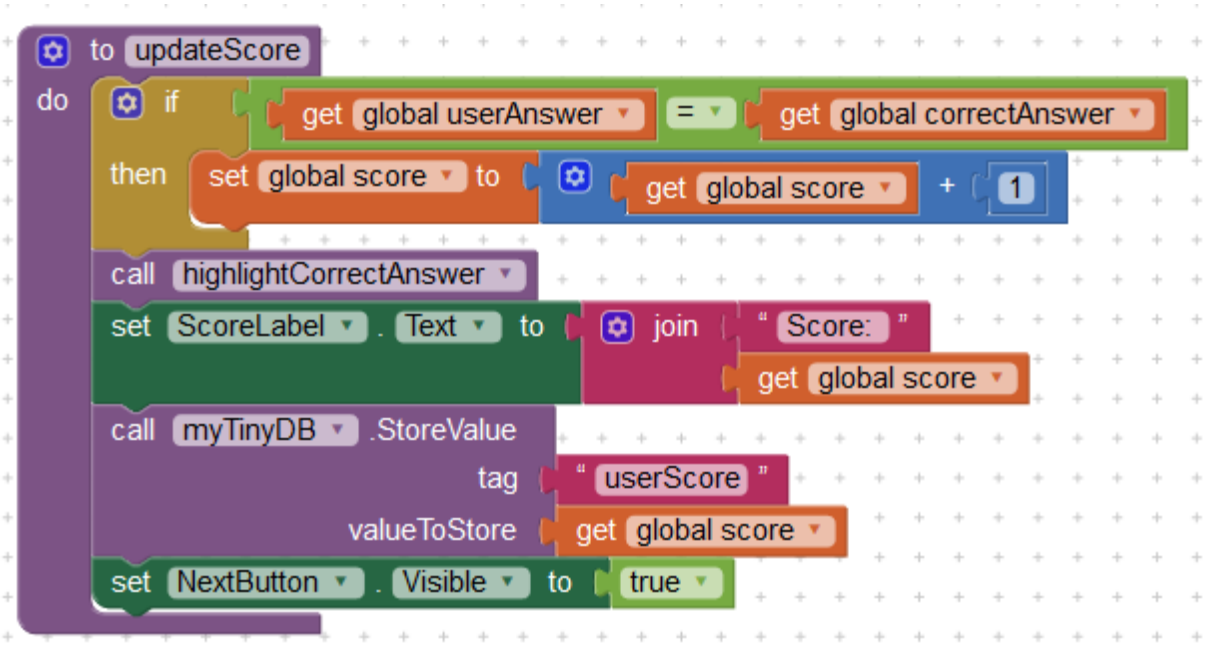
Procedure `deactivateButtons`

To deactivate the buttons we set the **`Enabled`** property to **`false`**.



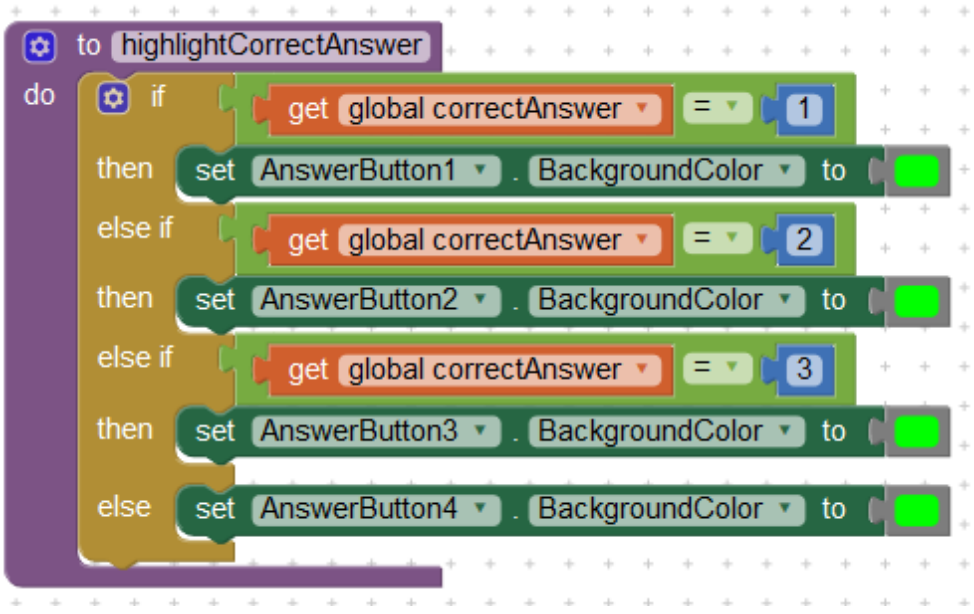
Procedure `updateScore`

- The user's answer is checked against the correct answer. If it is the same (true) the score is updated +1, otherwise not.
- The **`BackgroundColor`** of the correct answer is highlighted in green (procedure **`highlightCorrectAnswer`**).
- The value of the new score is stored in our Database **`TinyDB`**.
- The **`NextButton`** is shown, i.e. set **`Visible`** to **`true`**.



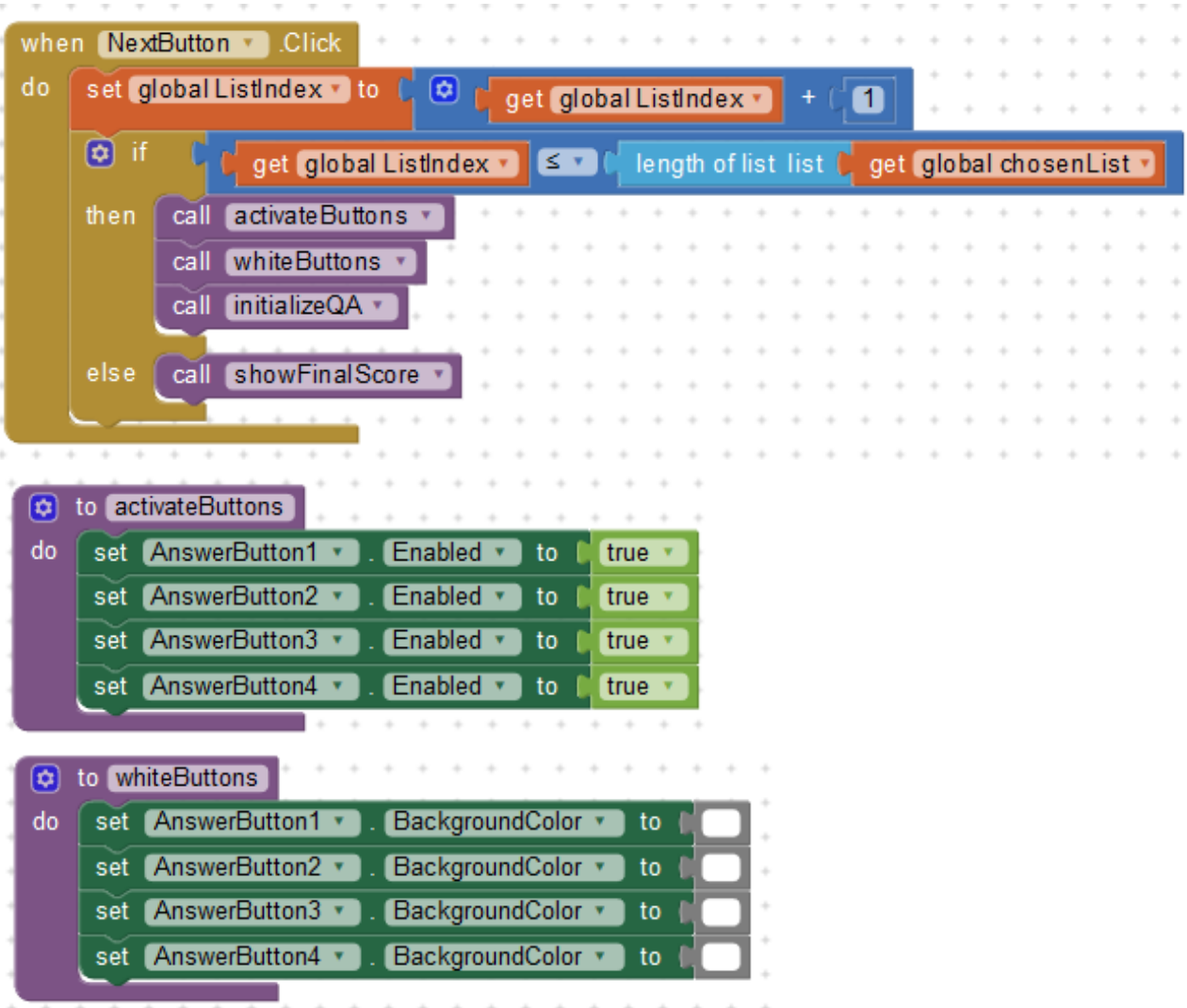
Procedure `highlightCorrectAnswer`

The **`BackgroundColor`** of the correct **`AnswerButton`** is set to green.



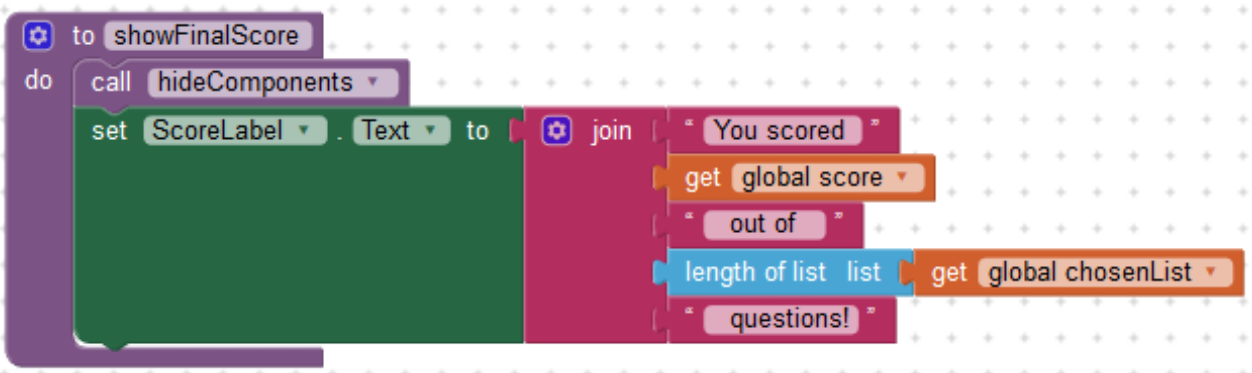
Moving to next question

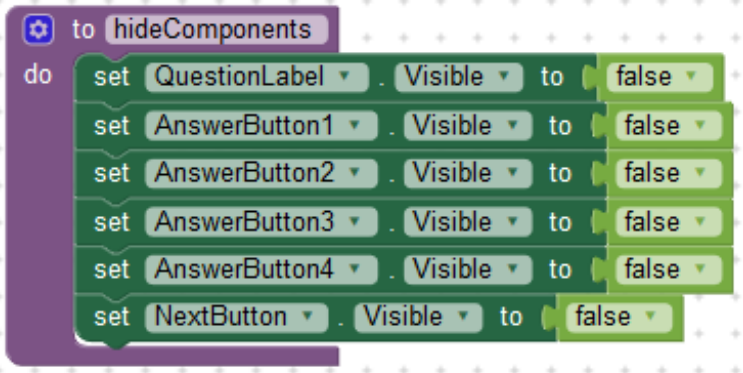
- When the user clicks on the **`NextButton`** the **`ListIndex`** points to the next question,
- …and if it hasn't reached the end of the question list,
- …activates all the buttons (procedure **`activateButtons`**),
- …changes the **`BackgroundColor`** of all the buttons (procedure **`whiteButtons`**),
- …and sets the text of the new question with its respective choices of answers.
- Otherwise, the final score is shown (procedure **`showFinalScore`**).



Show final score

- After completing the quiz challenge for a certain category the user is shown the final score.
- For this purpose, we hide some of the components such as the **`QuestionLabel`**, the **`AnswerButtonsX`** and the **`NextButton`** as shown below (procedure **`hideComponents`**).
- The message is "You scored X out of Y questions!" where X is the user's score and Y the total number of questions.





Testing the app

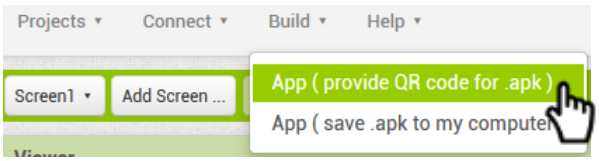
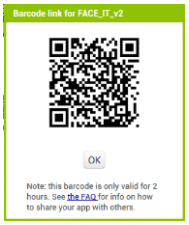
- At this point you've created two screens and added proper functionality to its componets. It's time to test your app check its behaviour. Make adjustments if necessary.

Worksheet 5 (Part E)

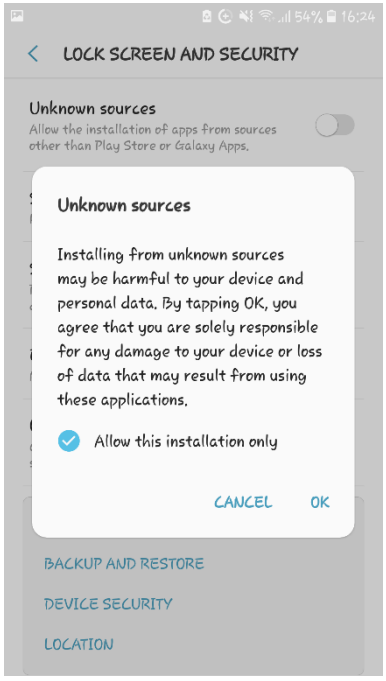
Downloading and installing the Application

Activity: You will download and install your recently-created Quiz App to your smartphone.
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?
Before downloading • AppInventor will bundle all your components and programming blocks of your Quiz app into an APK file (Android Package Kit). This package file format is used by the Android operating system for distribution and installation of mobile apps. Just like Windows systems use an .exe file for installing software. • There are two options to install the app to your smartphone: …either through a download link provided by a QR code …or by saving it first on the computer desktop. • We will go for the first option (QR code). Follow the screenshot instructions below  • After selecting the above choice, AppInventor will compile all parts, build the APK file (you will notice the progress bars) and provide the QR Code to download the file like shown below.  **NOTE**: In order to read the above QR code you have to have a "QR Reader". If you don't have any on your smartphone or tablet download one of your choice from Google Play.	

- Your security settings of your smartphone may prevent you from “installing from unknown sources”. For this time only, allow the installation since it’s your app you’ve built.



- After installation you are ready to try your application.

EXAMPLE for Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

DESCRIPTION
"What is software documentation?" Software documentation is written text or illustration that accompanies computer software or is embedded in the source code. It either explains how it operates or how to use it. (Wikipedia) Documentation is often divided into the following categories: • Installation: describes how to install a programme or device • Reference: detailed descriptions of particular items presented in alphabetical order. • Tutorial: teaches a user how to use the product. (www.webopedia.com)
PREPARATION
Building working groups • Students get in 8 intercultural mixed groups. • Each group gets a designated letter from A to H (i.e. 8 groups are formed). • Once you are in your group choose a catchy name, e.g. *App Rangers*, *Lions*, etc. • Each group gets a specific task of the Quiz documentation (see next page).
Connecting to AppInventor (Greek students only) • Open a browser, e.g. Chrome, Firefox. • In the address bar of your browser type the URL http://ai2.appinventor.mit.edu . • Sign in with your Google Account. • After this you're presented with the AppInventor environment.
Load the Quiz file • A final version of the Quiz file has been sent to the Greek students' e-mail accounts. • Import this file into your AppInventor account. • You are now ready to study the components.

GROUP **X**

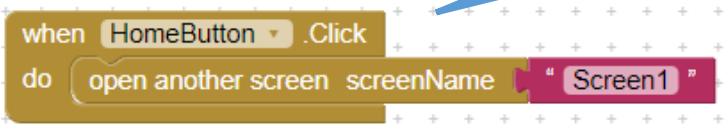
Group Name: _____

Students: _____

TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

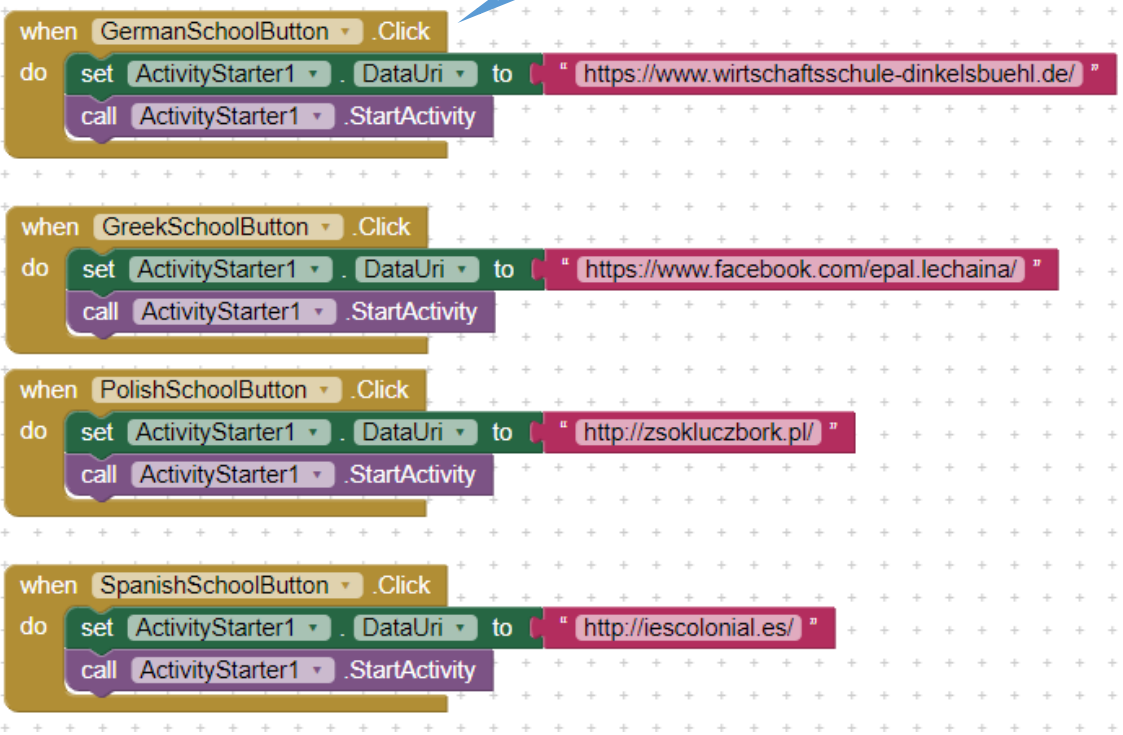
HelpScreen (Blocks View)

When the Home button is clicked it returns to the Home Screen (Sreen 1)



These are buttons to the webpages of each partner school.

Activity Starter is used to realize the opening of the web browser of the smartphone or tablet.



Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

DESCRIPTION
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Load the Quiz file • A final version of the Quiz file has been sent to the Greek students' e-mail accounts. • Import this file into your AppInventor account. • You are now ready to study the components.

GROUP **A**

Group Name: _____

Students: _____

TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

Screen 1 (Designer View)

Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

DESCRIPTION
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Load the Quiz file • A final version of the Quiz file has already been sent to the Greek students' e-mail account as an attachment. • Import this file into your AppInventor account. • You are now ready to study the components.

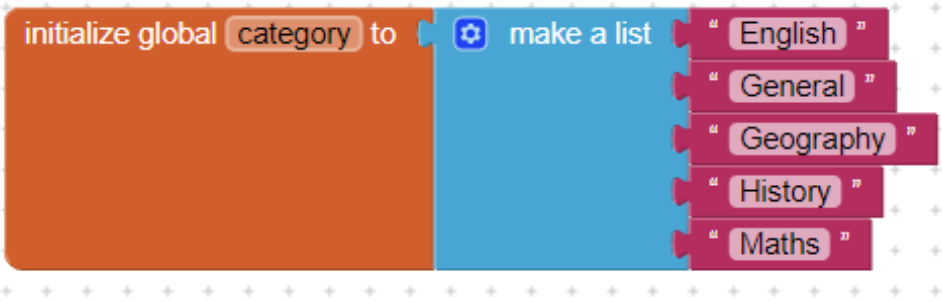
GROUP **B**

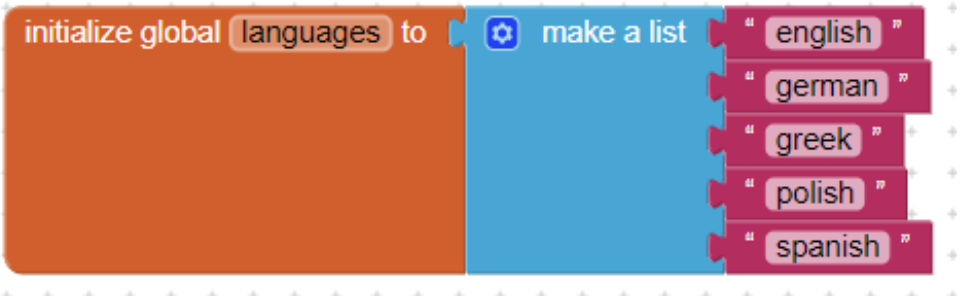
Group Name: _____

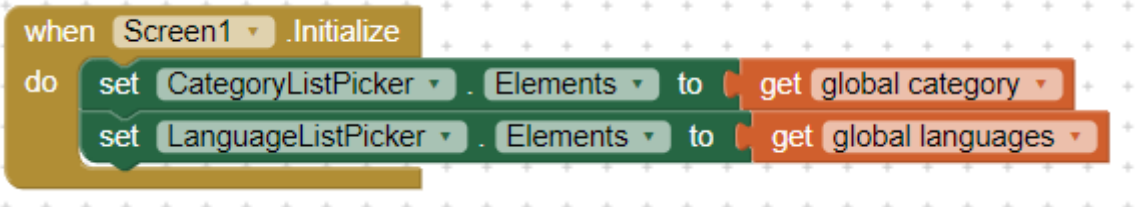
Students: _____

TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

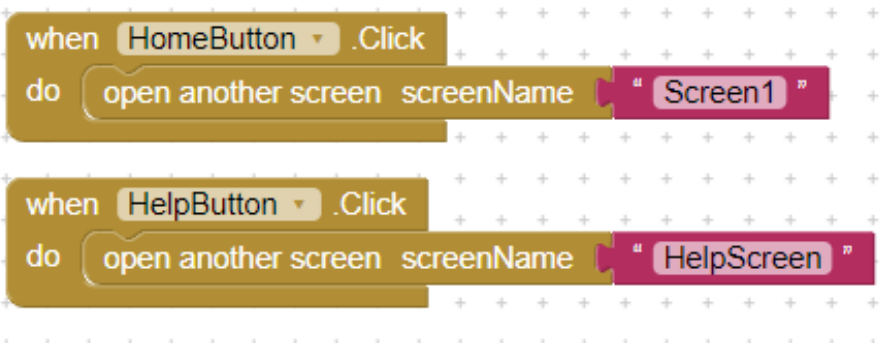
Screen 1 (Blocks View)



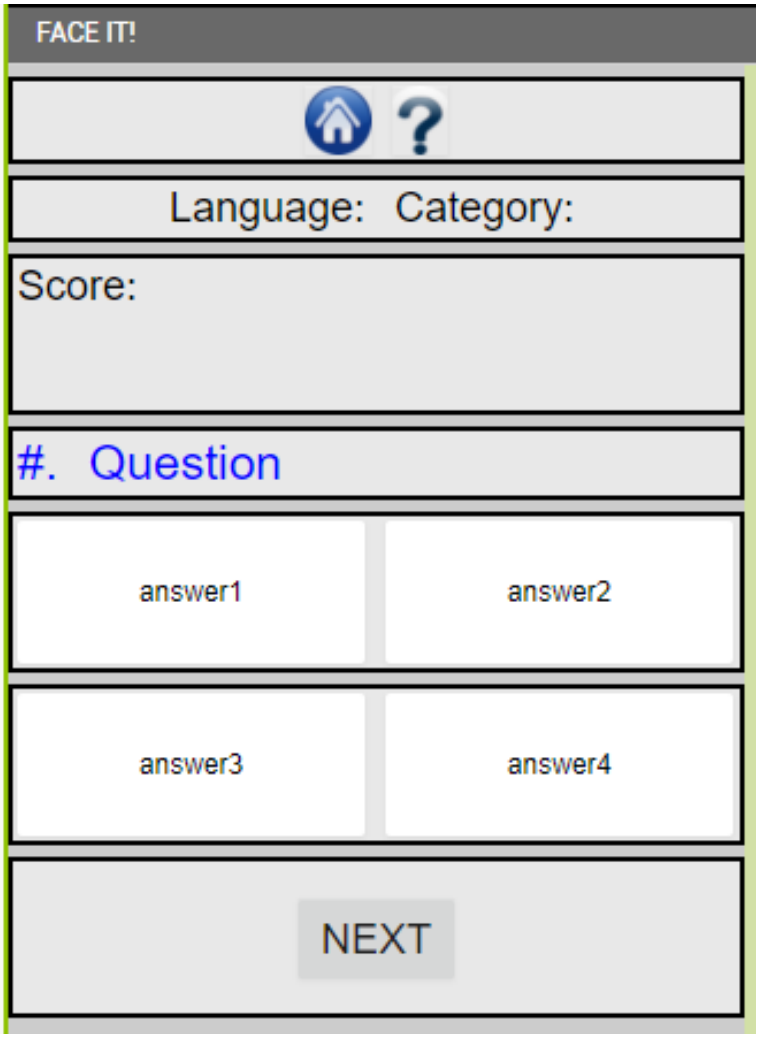




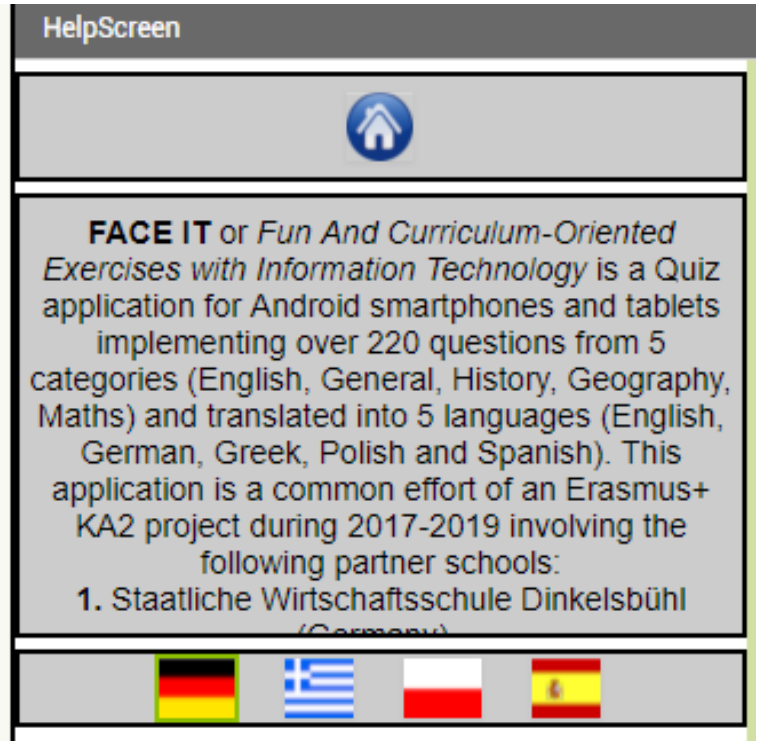
Screen 2 (Blocks View)



Screen 2 (Designer View)



HelpScreen (Designer View)



Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

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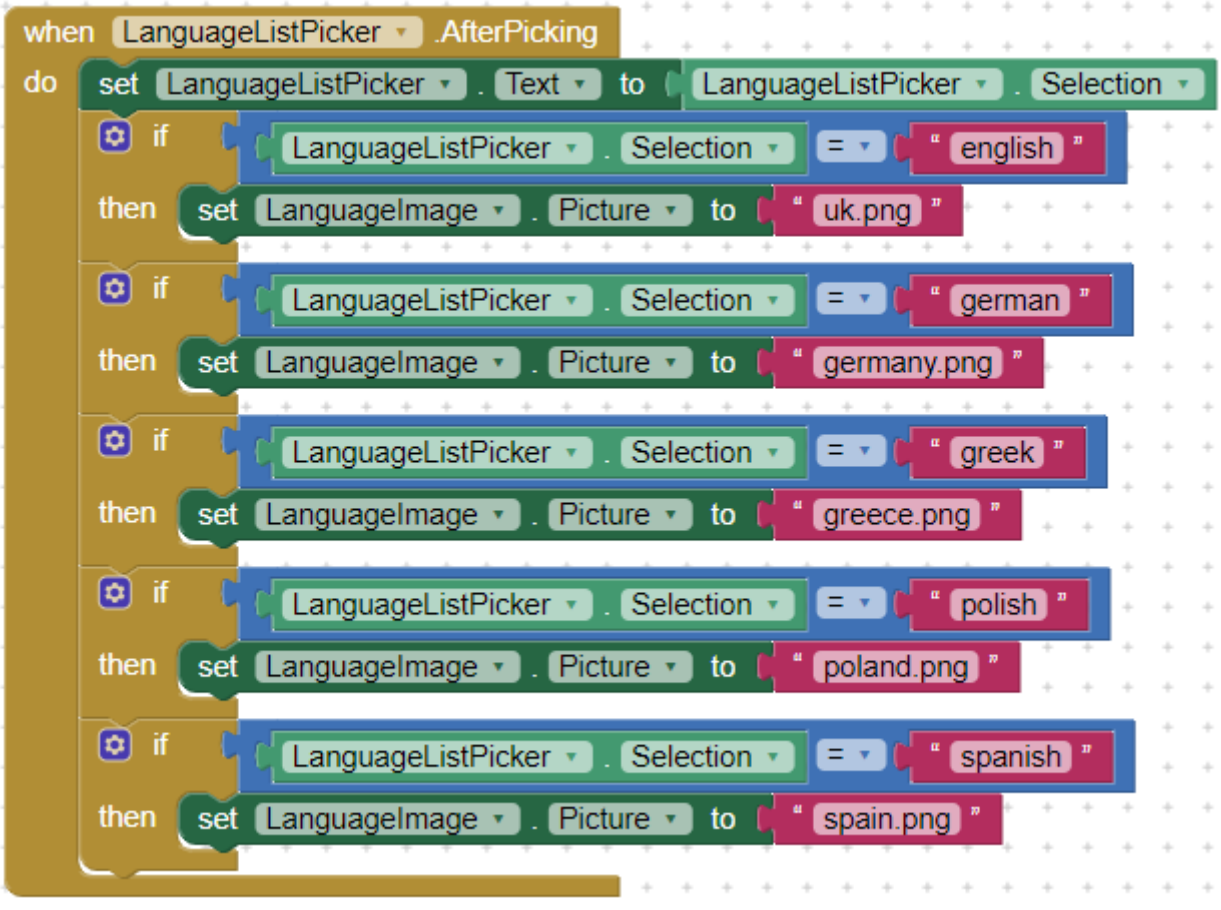
GROUP **C**

Group Name: _____

Students: _____

TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

Screen 1 (Blocks View)



Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

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Connecting to AppInventor (Greek students only) • Open a browser, e.g. Chrome, Firefox. • In the address bar of your browser type the URL http://ai2.appinventor.mit.edu . • Sign in with your Google Account. • After this you're presented with the AppInventor environment.
Load the Quiz file • A final version of the Quiz file has already been sent to the Greek students' e-mail account as an attachment. • Import this file into your AppInventor account. • You are now ready to study the components.

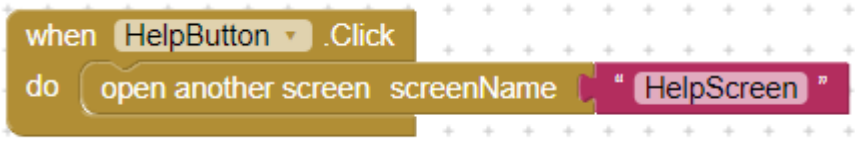
GROUP **D**

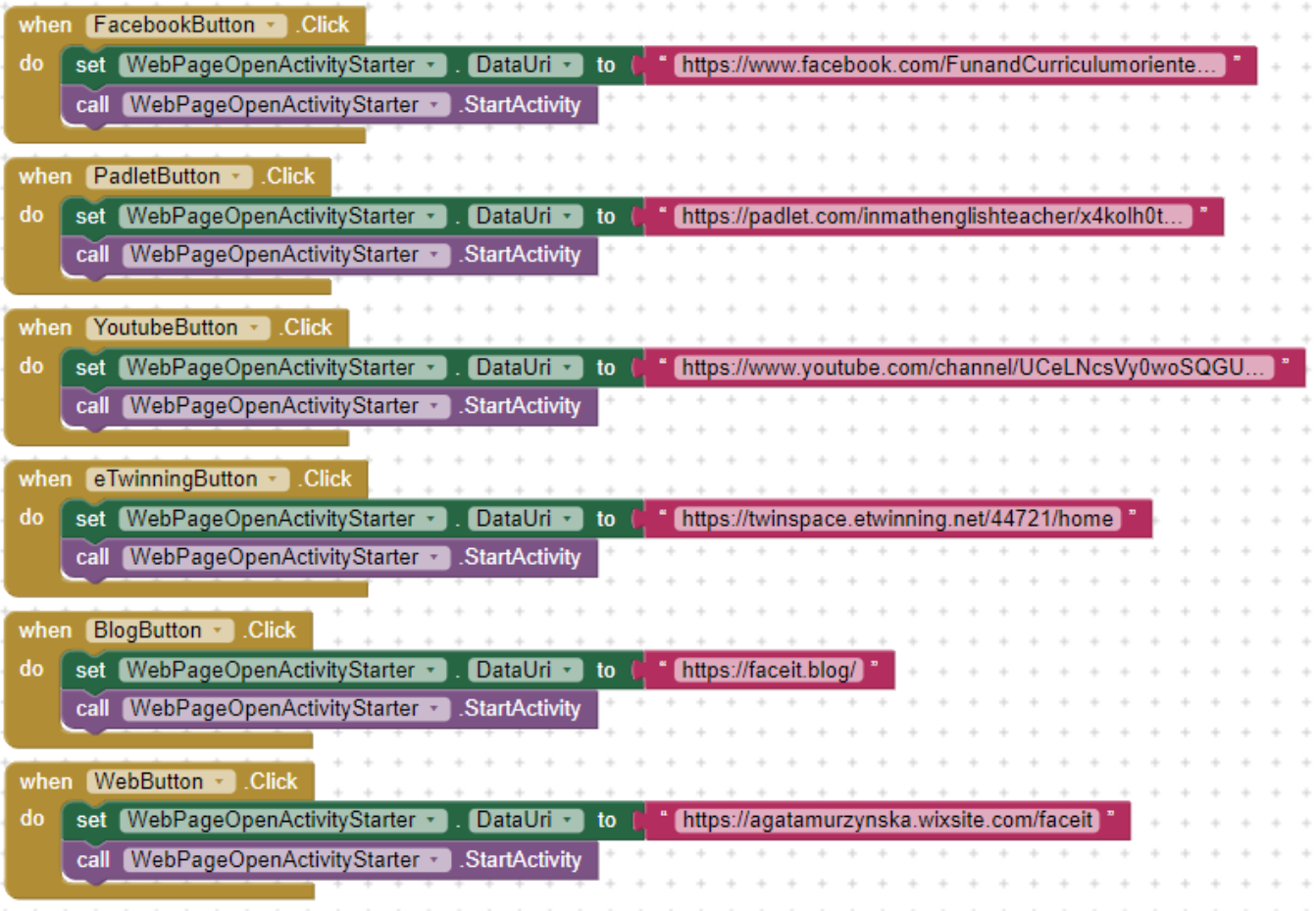
Group Name: _____

Students: _____

TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

Screen 1 (Blocks View)





Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

DESCRIPTION
"What is software documentation?" Software documentation is written text or illustration that accompanies computer software or is embedded in the source code. It either explains how it operates or how to use it. (Wikipedia) Documentation is often divided into the following categories: • Installation: describes how to install a programme or device • Reference: detailed descriptions of particular items presented in alphabetical order. • Tutorial: teaches a user how to use the product. (www.webopedia.com)
PREPARATION
Building working groups • Students get in 8 intercultural mixed groups. • Each group gets a designated letter from A to H (i.e. 8 groups are formed). • Once you are in your group choose a catchy name, e.g. *App Rangers*, *Lions*, etc. • Each group gets a specific task of the Quiz documentation (see next page).
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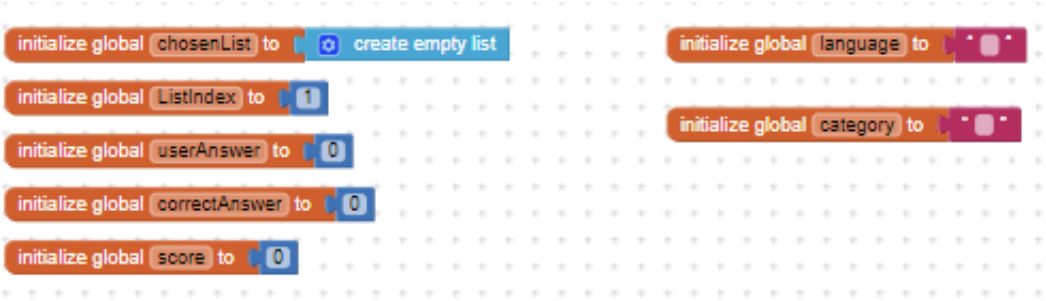
GROUP **E**

Group Name: _____

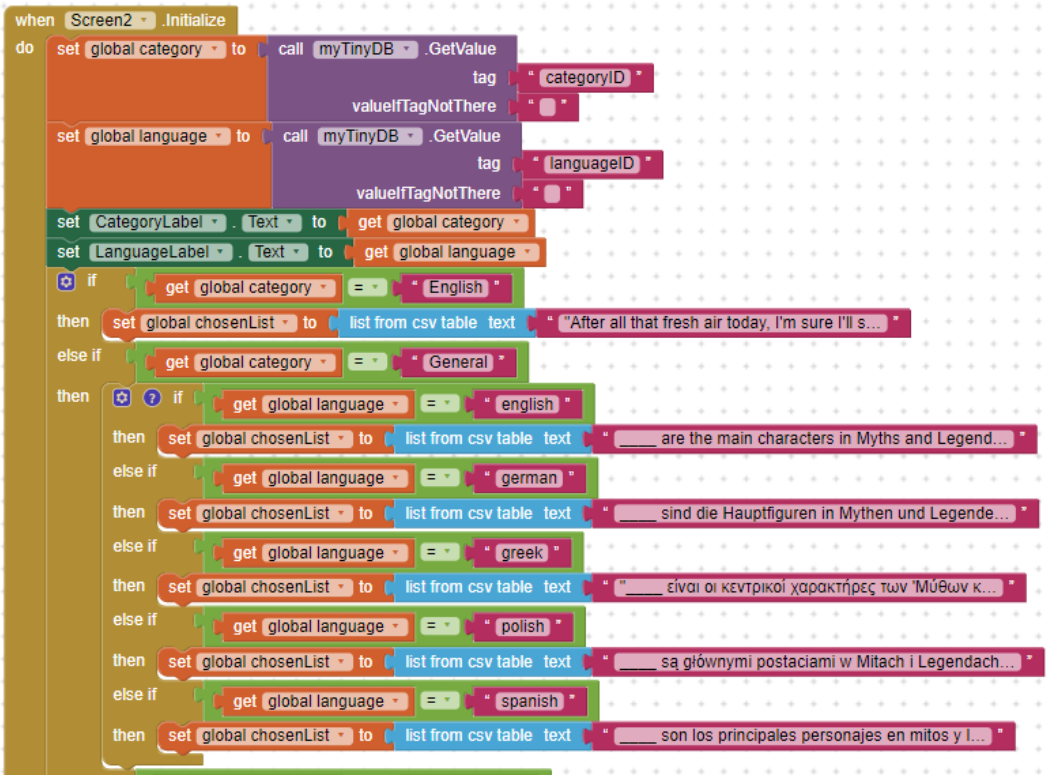
Students: _____

TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

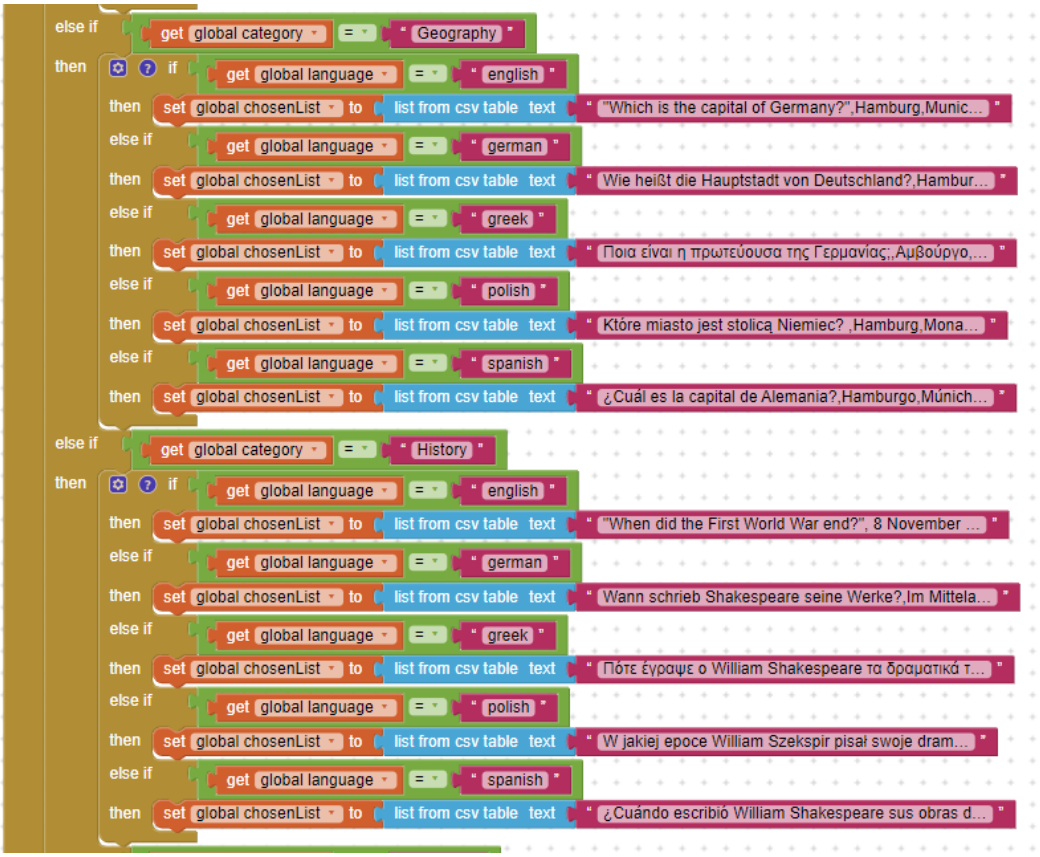
Screen 2 (Blocks View)



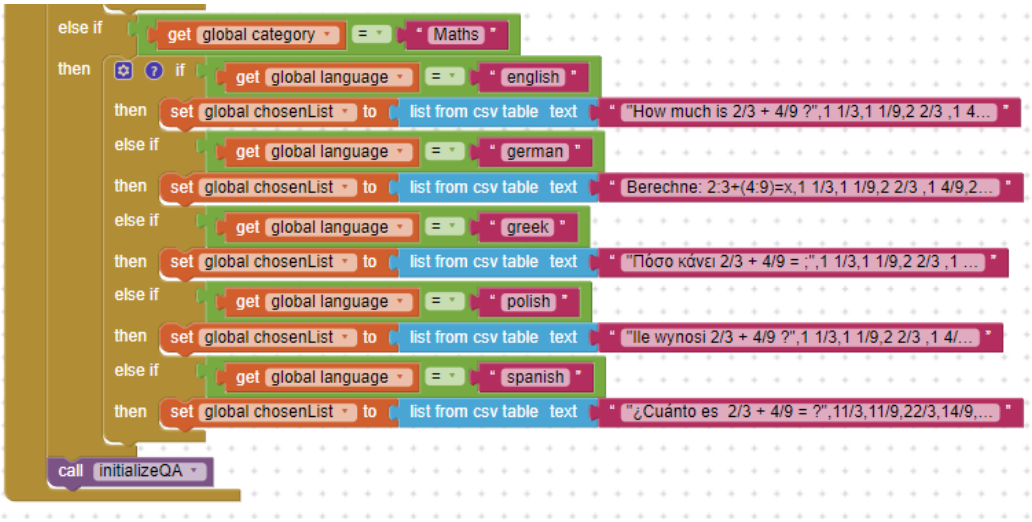
Screen 2 (Blocks View)



Screen 2 (Blocks View)



Screen 2 (Blocks View)



Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

DESCRIPTION
"What is software documentation?" Software documentation is written text or illustration that accompanies computer software or is embedded in the source code. It either explains how it operates or how to use it. (Wikipedia) Documentation is often divided into the following categories: • Installation: describes how to install a programme or device • Reference: detailed descriptions of particular items presented in alphabetical order. • Tutorial: teaches a user how to use the product. (www.webopedia.com)
PREPARATION
Building working groups • Students get in 8 intercultural mixed groups. • Each group gets a designated letter from A to H (i.e. 8 groups are formed). • Once you are in your group choose a catchy name, e.g. *App Rangers*, *Lions*, etc. • Each group gets a specific task of the Quiz documentation (see next page).
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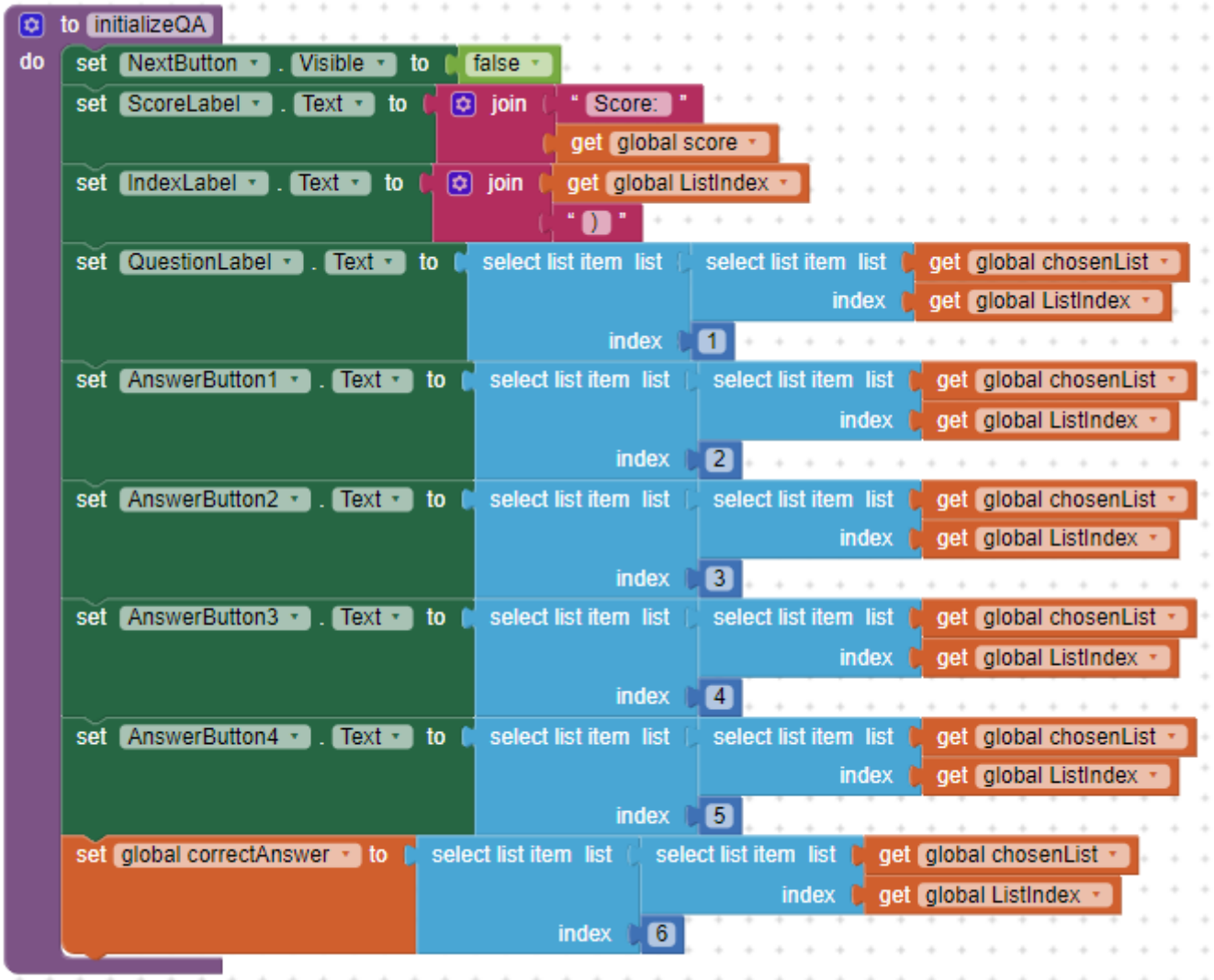
GROUP **F**

Group Name: _____

Students: _____

TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

Screen 2 (Blocks View)



Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

DESCRIPTION
"What is software documentation?" Software documentation is written text or illustration that accompanies computer software or is embedded in the source code. It either explains how it operates or how to use it. (Wikipedia) Documentation is often divided into the following categories: • Installation: describes how to install a programme or device • Reference: detailed descriptions of particular items presented in alphabetical order. • Tutorial: teaches a user how to use the product. (www.webopedia.com)
PREPARATION
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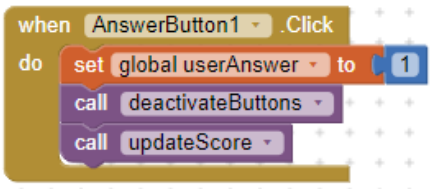
GROUP **G**

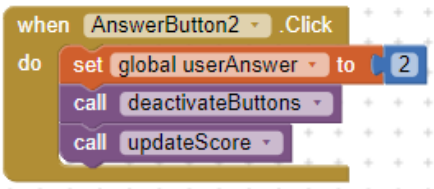
Group Name: _____

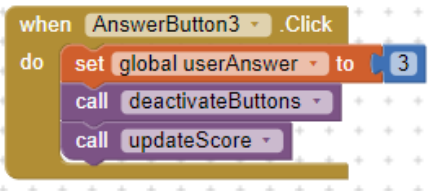
Students: _____

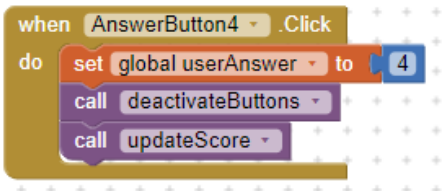
TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

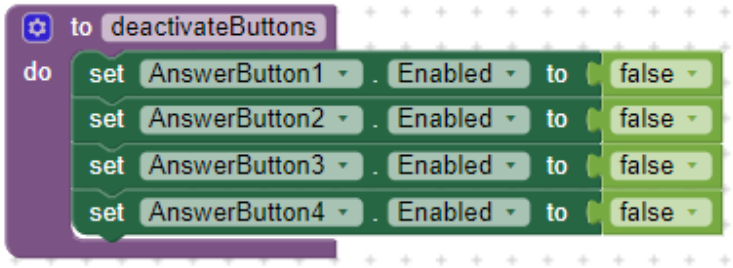
Screen 2 (Blocks View)











Worksheet 6

Software Documentation

Activity: Students study in detail and document the different parts of the Quiz Application.
Time: **30** Minutes

DESCRIPTION
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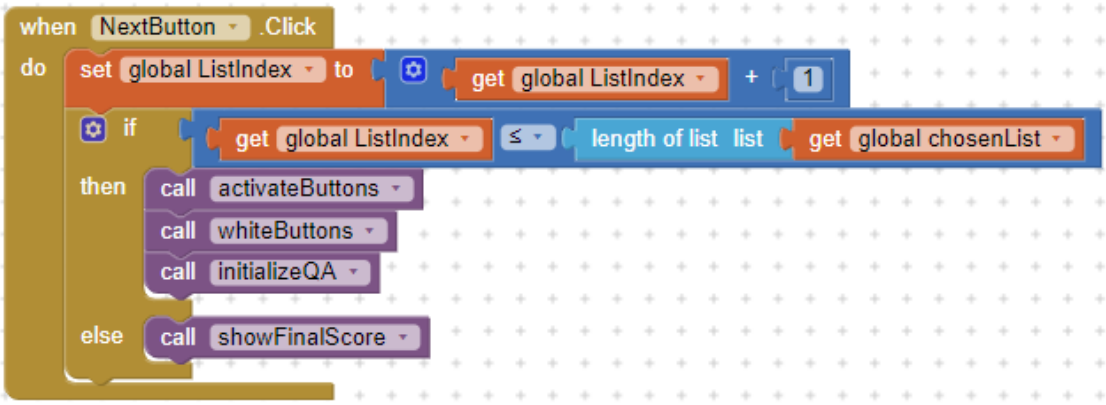
GROUP **H**

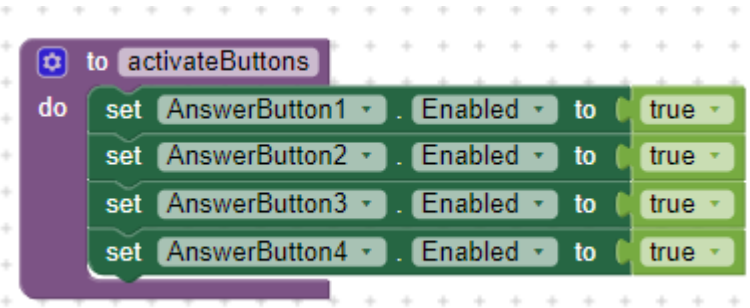
Group Name: _____

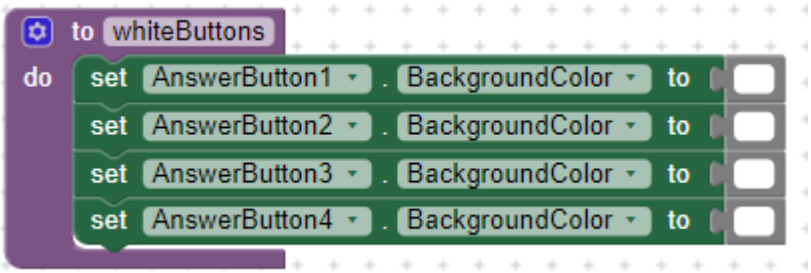
Students: _____

TASK	DONE?
Documenting • Read your group assignment **carefully**. • Each group gets a small part of the entire Quiz application **in form of screenshots**. • In order to understand your assignment you may load the app on your smartphone, experiment with it, and browse through the different screens in Blocks or Designer View. • Write your comments **around** the screenshot as shown in the example. • After completion you are invited to present your results in the plenary session.	

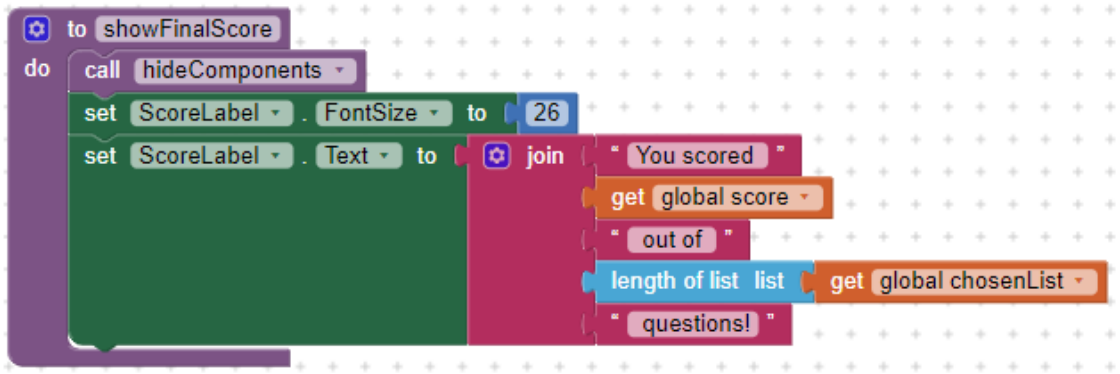
Screen 2 (Blocks View)

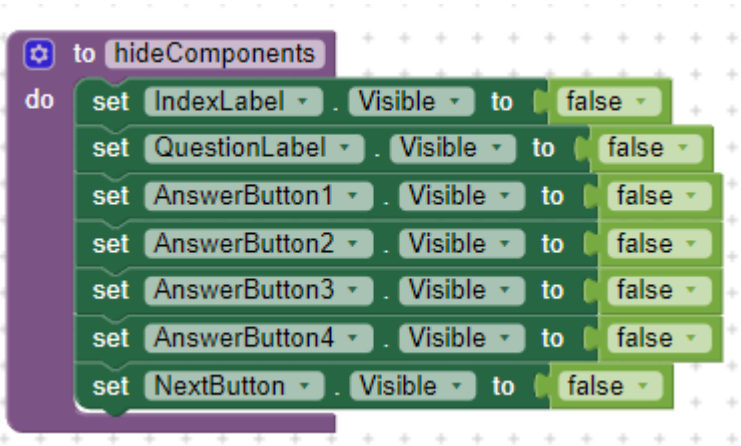




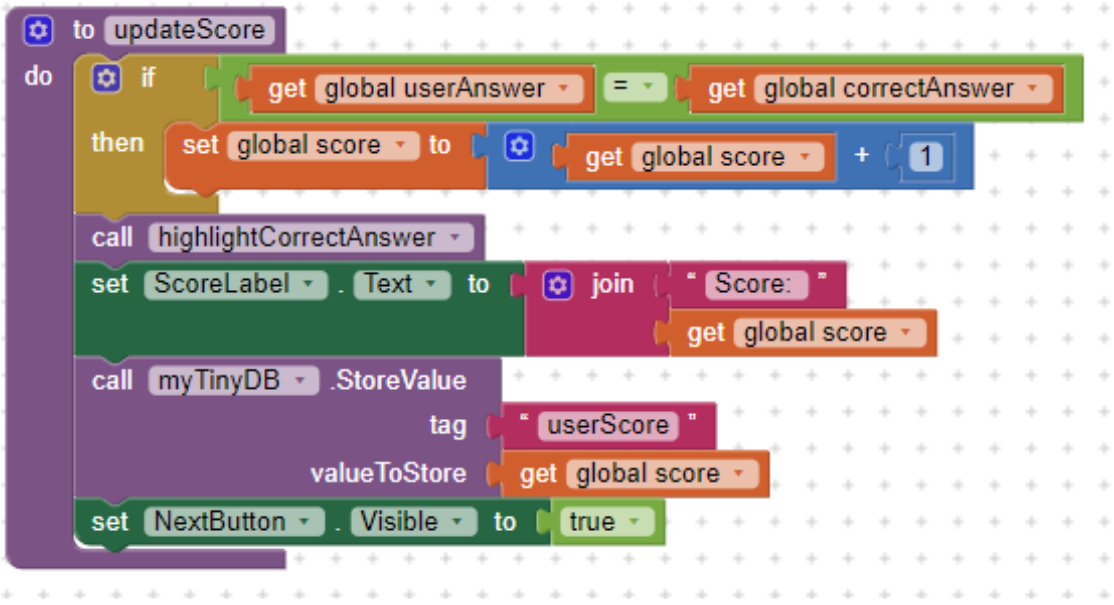


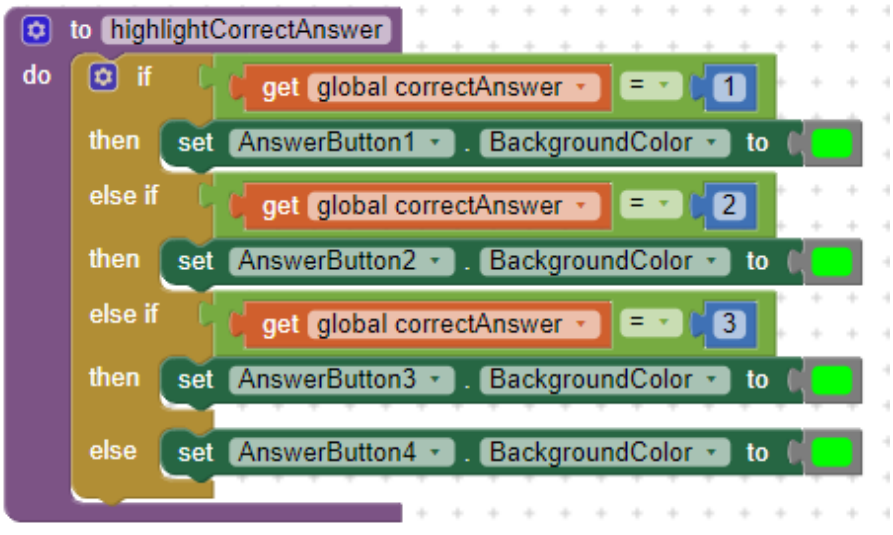
Screen 2 (Blocks View)



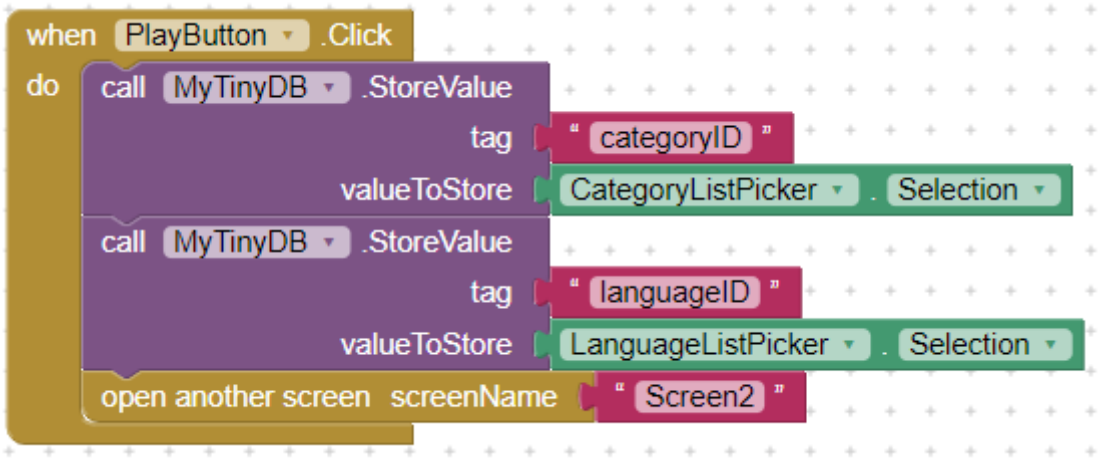


Screen 2 (Blocks View)





Screen 1 (Blocks View)

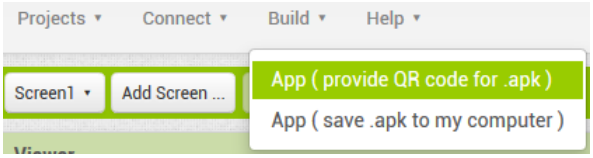


Worksheet 7

Testing the QuizApp

Activity: Students test the Quiz App and comment on positive attributes as well as weaknesses.
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.

PREPARATION
Building working groups • *You stay in the same group you worked previously (Worksheet 6).*
Download on smartphone/tablet • Download the Android Package Kit (.apk file) to your smartphone or tablet as it's shown below 

TASK	DONE?
Why do we need testing? • Brainstorm your ideas in the group. • Present it to the plenary session.	
What should be tested? • Discuss in the plenary session.	
Strong/Weak attributes • Discuss in your group: ➢ How does the Quiz App behave? ➢ What are its strong attributes? ➢ Are there any weaknesses? ➢ What do you like most? ➢ What is missing or at fault? • Write down your observations in the respective columns of the following table:	

STRONG	WEAK