

Introduction to Design (Track 3)

10.2 Hands-on: Color Dots App 2

Zilu Liang

www.zilu-liang.net/id3

Important!!

Please disinfectize your hands before entering the classroom!

入室前にアルコールを使用して手指消毒を行ってください。

Please disinfectize your chair and table!

- ①ペーパーにアルコールを噴霧してください。
- ②アルコールが噴霧されたペーパーで、使用箇所（テーブル、椅子など）を拭き取ってください。
- ③使用済のペーパーは廊下のごみ箱に捨ててください。



Open the project of week 9 color dots app

The image shows two screenshots of the MIT App Inventor web interface. The left screenshot shows the 'My projects' menu open, with a red circle around the 'My projects' header and a red arrow pointing to the 'w9paint' project in the list on the right screenshot.

MIT APP INVENTOR

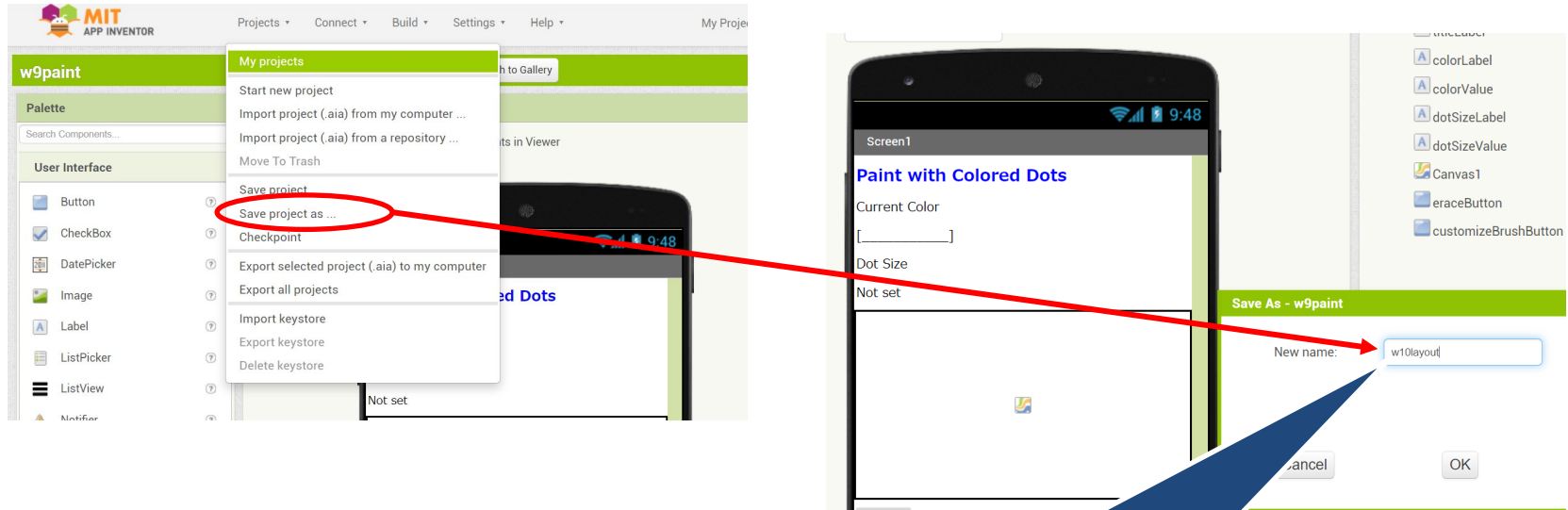
Projects | Connect | Build | Settings | Help | My Projects | View

Start new project | Move To Trash | View Trash | Login to Gallery | Publish to Gallery

Name	Date Created
<input type="checkbox"/> w10layout	Jun 17, 2021, 11:07:34 PM
<input type="checkbox"/> w9paint_b	Jun 10, 2021, 11:16:10 PM
<input type="checkbox"/> w9paint	Jun 10, 2021, 5:14:56 PM
<input type="checkbox"/> w8aud	Jun 3, 2021, 5:27:59 PM
<input type="checkbox"/> w7anim	May 27, 2021, 11:27:40 AM
<input type="checkbox"/> w6addit	May 20, 2021, 8:31:08 PM
<input type="checkbox"/> w6a	May 20, 2021, 7:04:58 PM

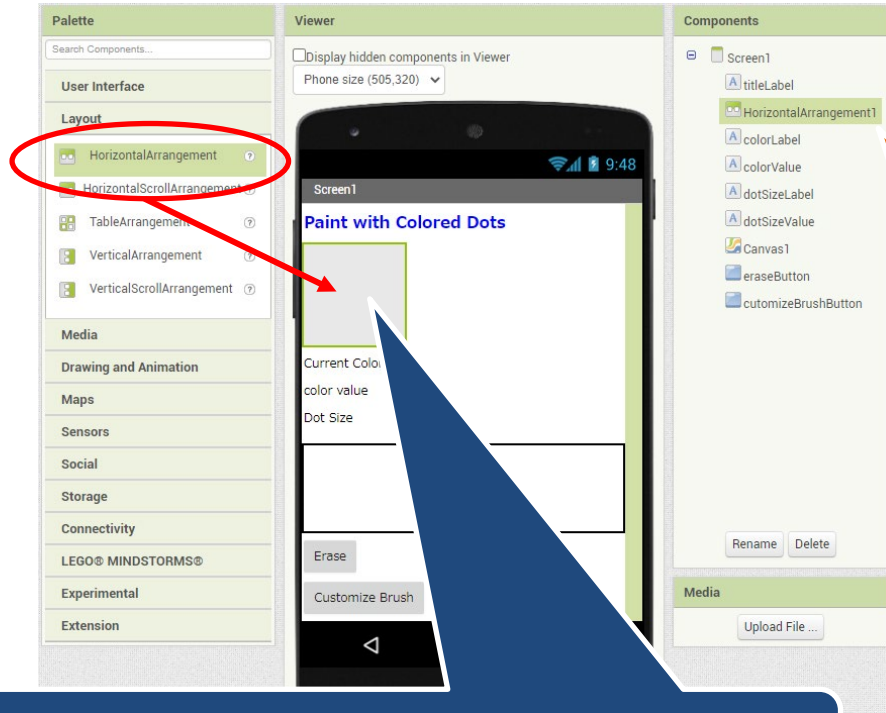
Choose the project of the 9th week

Use 'Save project as' to save the project as a new project



Name a new project,
for example, "w10layout".

Group 'colorLabel' and 'colorValue' using HorizontalArrangement

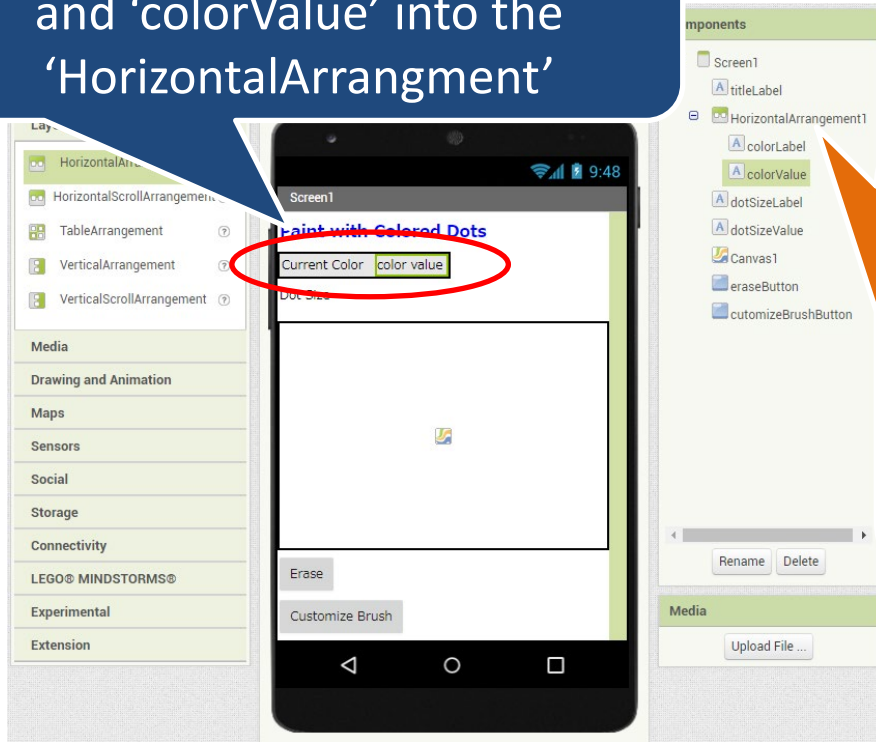


Note that the 'HorizontalArrangement' is at the same level as the 'colorLabel' and 'colorValue'

Drag and drop a 'HorizontalArrangement'

Group 'colorLabel' and 'colorValue' using HorizontalArrangement

Drag and drop the 'colorLabel' and 'colorValue' into the 'HorizontalArrangement'



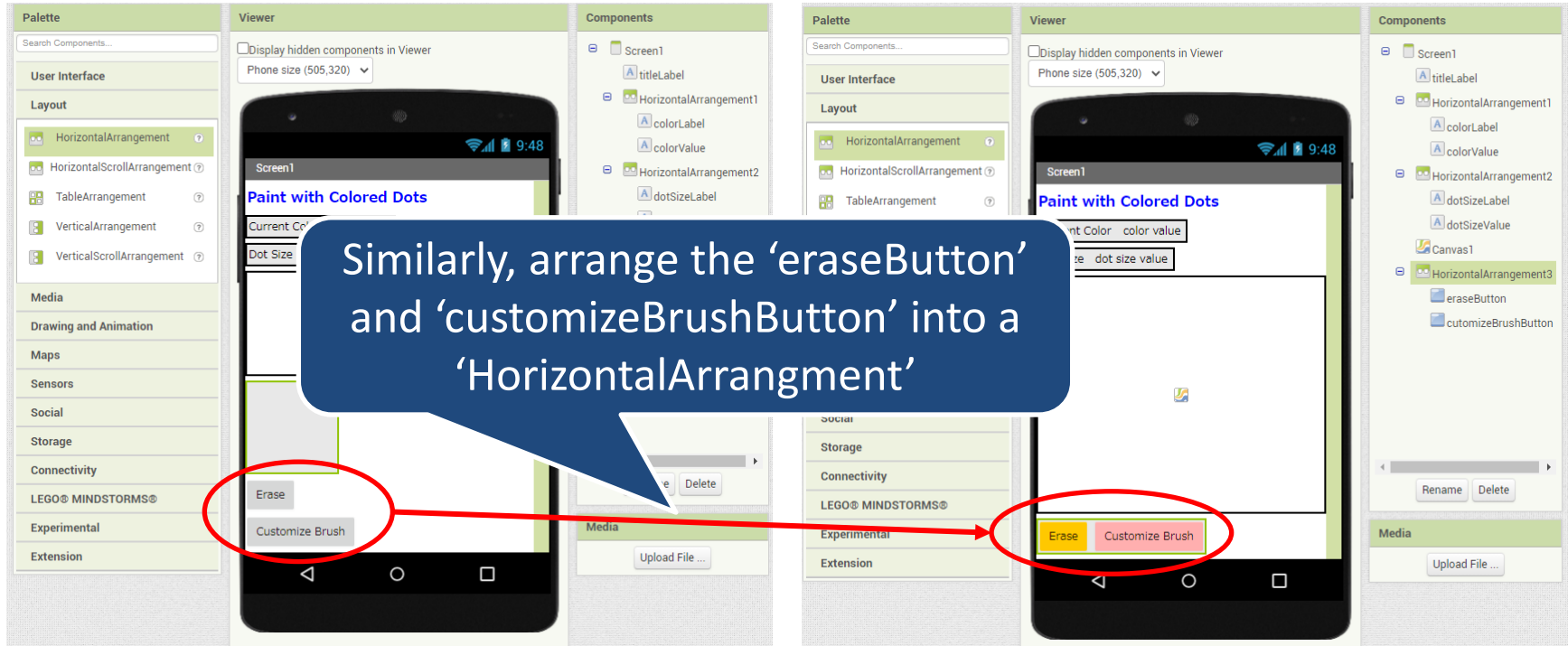
Note that the 'HorizontalArrangement' is now the parent of the 'colorLabel' and 'colorValue'

Arrange 'dotSizeLabel' and 'dotSizeValue' into a 'HorizontalArrangement'

The image displays two side-by-side screenshots of a mobile application development environment. The left screenshot shows a mobile app interface with a 'Paint with Colored Dots' screen. A red circle highlights the 'Current Color' label and value field, and another red circle highlights the 'Dot Size' label and value field. A blue callout box with white text points to these elements, stating: 'Similarly, arrange the 'dotSizeLabel' and 'dotSizeValue' into a 'HorizontalArrangement''. The right screenshot shows the same app interface, but with the 'dotSizeLabel' and 'dotSizeValue' components now arranged horizontally within a 'HorizontalArrangement2' widget. A red circle highlights this new arrangement. The 'Components' panel on the right side of the IDE shows the hierarchy of components, including 'Screen1', 'HorizontalArrangement1', 'colorLabel', 'colorValue', 'HorizontalArrangement2', 'dotSizeLabel', 'dotSizeValue', 'Canvas1', 'eraseButton', and 'customizeBrushButton'. The 'dotSizeLabel' and 'dotSizeValue' components are highlighted in green in the 'Components' panel.

Similarly, arrange the 'dotSizeLabel' and 'dotSizeValue' into a 'HorizontalArrangement'

Arrange 'eraseButton' and 'customizeBrushButton' into a 'HorizontalArrangement'

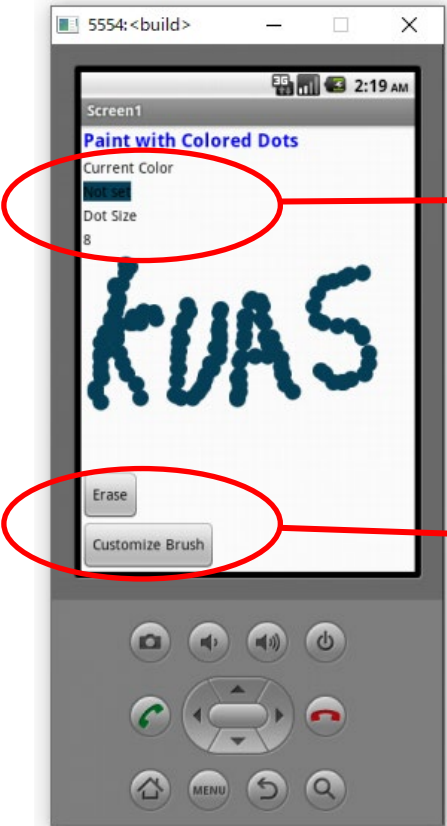


Test App on Emulator

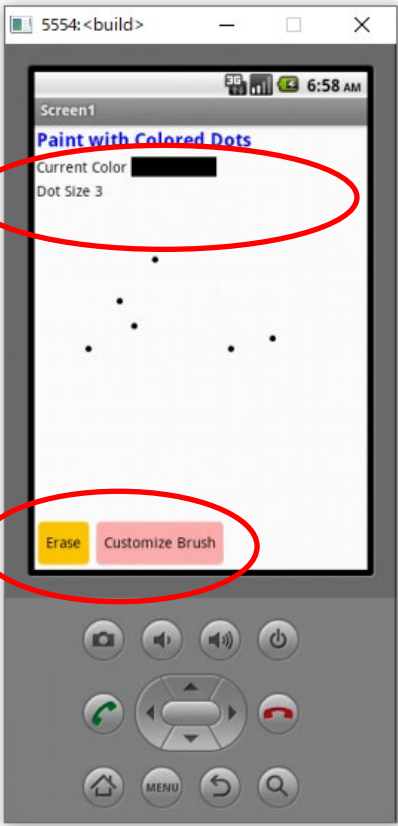
Click on the aiStarter on your computer, you should see the following window open.

```
aiStarter
127.0.0.1 -- [21/Apr/2021 17:00:23] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:23] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:24] "GET /start/ HTTP/1.1" 200 0
127.0.0.1 -- [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:24] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:25] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:26] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:27] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:28] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:29] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:30] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:31] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:32] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:33] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:34] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:35] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:36] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:37] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:38] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:39] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:40] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:41] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:42] "GET /echeck/ HTTP/1.1" 200 40
127.0.0.1 -- [21/Apr/2021 17:00:43] "GET /echeck/ HTTP/1.1" 200 67
Device = emulator-5554
127.0.0.1 -- [21/Apr/2021 17:01:09] "GET /restart/emulator-5554 HTTP/1.1" 200 0
```

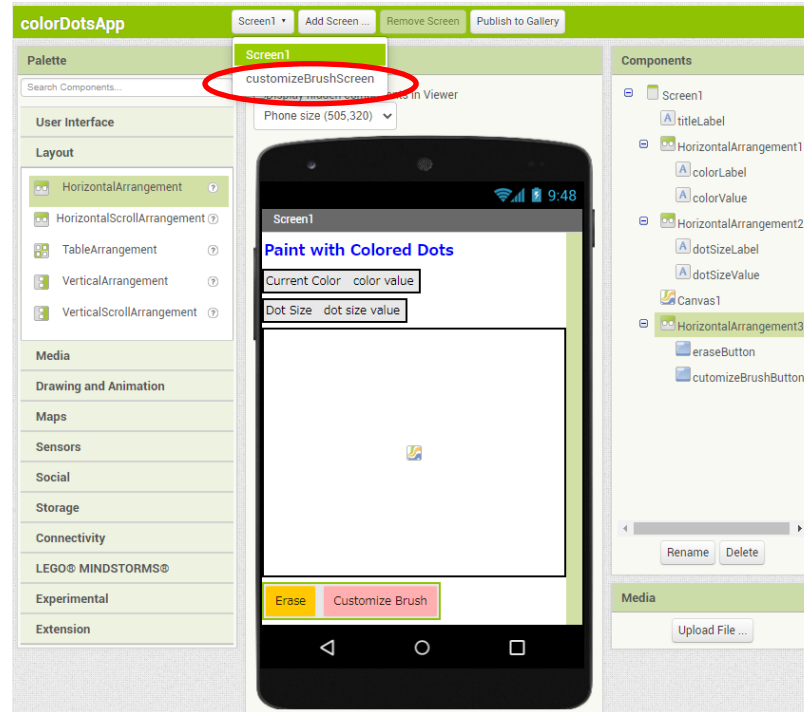
Before using layouts



After using layouts



Switch to 'customizeBrushScreen'



Organize TextBoxes using TableArrangement

The screenshot displays the LEGO MINDSTORMS software interface. On the left, the 'Palette' shows the 'TableArrangement' component highlighted with a red circle and a red arrow pointing to its use in the 'Viewer'. The 'Viewer' shows a mobile device screen with a 'customizeBrushScreen' app containing three text boxes labeled 'Red', 'Green', and 'Blue', and a 'Test Color' button. On the right, the 'Components' panel lists the app's components, including 'TableArrangement1'. The 'Properties' panel for 'TableArrangement1' shows 'Columns' set to 2 and 'Rows' set to 3.

Set column to 2,
row to 3

Organize TextBoxes using TableArrangement

Drag and drop the R, G, B labels and TextBoxes into the TableArrangement

The image illustrates the process of organizing UI elements in the LEGO MINDSTORMS software. On the left, the 'Palette' shows the 'TableArrangement' layout selected. The center pane shows a mobile device preview with a 'customizeBrushScreen' containing 'Red', 'Green', and 'Blue' labels and their corresponding input boxes. The right pane shows the properties for these elements. A final screenshot on the right shows the completed screen with the labels and input boxes neatly arranged in a table.

Code Anatomy: Color Dots App

Screen1

```
initialize global currentColor to [black]
```

→ Initialize global variables 'currentColor' and 'dotSize'; these variables set the brush color to 'black' and brush size to '3'.

```
initialize global dotSize to [3]
```

```
when Screen1 .Initialize
```

```
do set colorValue . BackgroundColor to get global currentColor  
set dotSizeValue . Text to get global dotSize
```

→ When the app starts, the brush color and size are set to the 'currentColor' and 'dotSize'

```
when Canvas1 .Touched
```

```
[x y] touchedAnySprite
```

```
do set Canvas1 . PaintColor to get global currentColor  
call Canvas1 .DrawCircle  
centerX get x  
centerY get y  
radius dotSizeValue . Text  
fill true
```

→ Allow users to draw solid dots by touching the canvas:

- The color of the dot is the value of variable 'currentColor'
- The location of the dot is the coordinate of the touch
- The size of the dot is the value of variable 'dotSize'

Code Anatomy: Color Dots App

Screen1

```
when customizeBrushButton .Click
do
  open another screen with start value screenName "customizeBrushScreen"
  start value
  make a list
  get global currentColor
  get global dotSize
```

If 'customizeBrushButton' is clicked, open 'customizeBrushScreen' and pass on the startValue

```
when eraseButton .Click
do
  call Canvas1 .Clear
```

If 'eraseButton' is clicked, clear 'Canvas1'

```
when Screen1 .OtherScreenClosed
  otherScreenName result
do
  set otherScreenName to "customizeBrushScreen"
  set global currentColor to select list item list get result index 1
  set global dotSize to select list item list get result index 2
  set colorValue . BackgroundColor to get global currentColor
  set dotSizeValue . Text to get global dotSize
```

When 'customizeBrushScreen' is closed, fetch 'result' and set brush color and size to the fetched values

customizeBrushScreen

```
initialize global currentColor to
initialize global dotSize to 3
```

Initialize global variables for this screen

```
when customizeBrushScreen .Initialize
do
  set global currentColor to select list item list get start value index 1
  set global dotSize to select list item list get start value index 2
```

```
when returnButton .Click
do
  set global dotSize to dotSizeTextBox . Text
  close screen with value result
  make a list
  get global currentColor
  get global dotSize
```

If 'returnButton' is clicked, close 'customizeBrushScreen' and pass the 'result' to 'Screen1'

Code Anatomy: Color Dots App

customizeBrushScreen

```
when testColorButton .Click
do
  set global currentColor to make color
  make a list
  redTextBox . Text
  greenTextBox . Text
  blueTextBox . Text
  set testColorValue . BackgroundColor to get global currentColor
```



If 'testColorButton' is clicked, grab user's inputs to generate a color code; set the background color of 'testColorValue' label to user specified color

```
when resetButton .Click
do
  set redTextBox . Text to ""
  set redTextBox . Hint to "0~255"
  set greenTextBox . Text to ""
  set greenTextBox . Hint to "0~255"
  set blueTextBox . Text to ""
  set blueTextBox . Hint to "0~255"
  set testColorValue . BackgroundColor to black
  set dotSizeTextBox . Text to 3
```



If 'resetButton' is clicked

- clear the TextBoxes and set hint to '0~255';
- set the background color of 'testColorValue' label to black
- set the dot size to 3

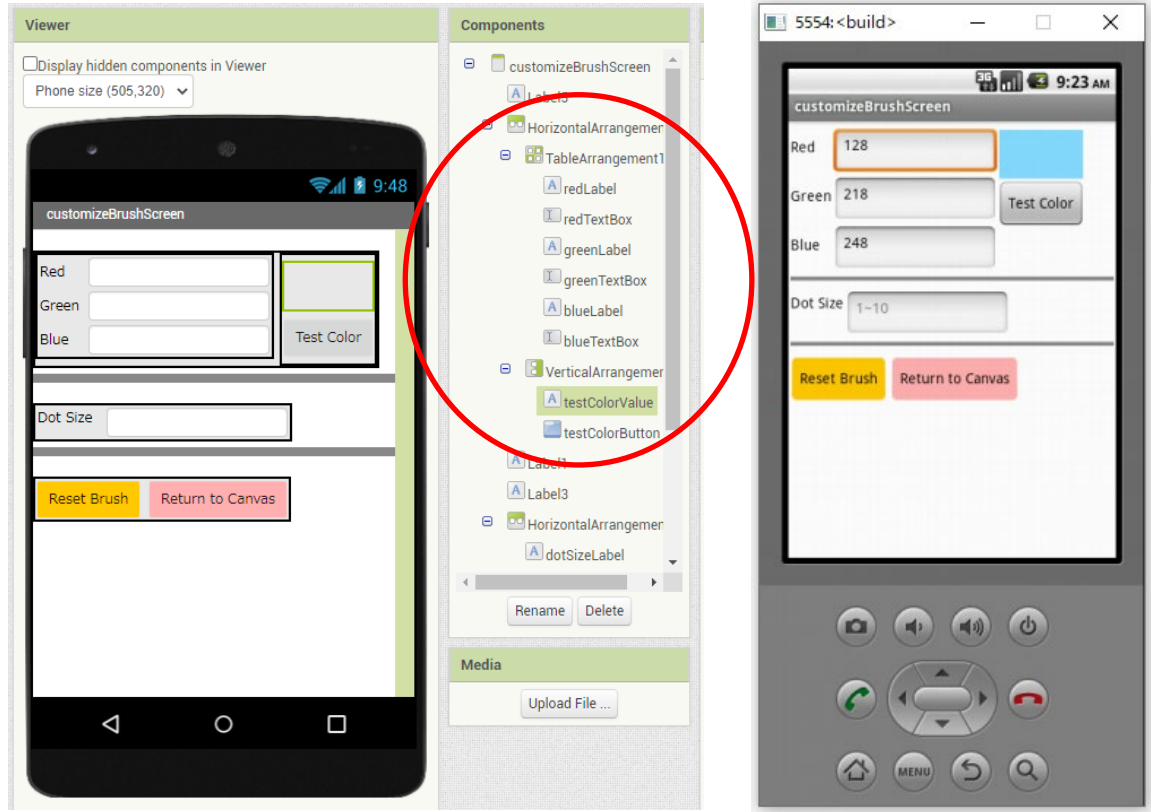
Assignment

10.1 Complete the hands-on tasks in the tutorial

- ✓ If you finish all the steps in class, show your Color Dots App to one of the instructors before you leave
- ✓ If you cannot finish all the steps, you can work on them after class and show your app to one of the instructors in the class next week

Assignment (Optional)

10.2 If you have time, why not rearranging the UI of the 'customizeBrush Screen' using nested layout



Assignment

10.3 We only have 4 classes left before the final presentation. It's time to think about your self-directed project.

Download the 'AppConceptRoadmap.docx' from Teams. Fill the form and submit it by **9th July**.

There is an example on Teams.

KUAS

KYOTO UNIVERSITY of ADVANCED SCIENCE

京都先端科学大学

