

Introduction to Design (Track 3)

4.2 Hands-on: Counter App and BMI Calculator App

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Important!!

Please disinfectize your hands before entering the classroom!

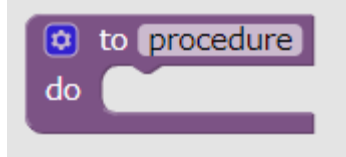
入室前にアルコールを使用して手指消毒を行ってください。

Please disinfectize your chair and table!

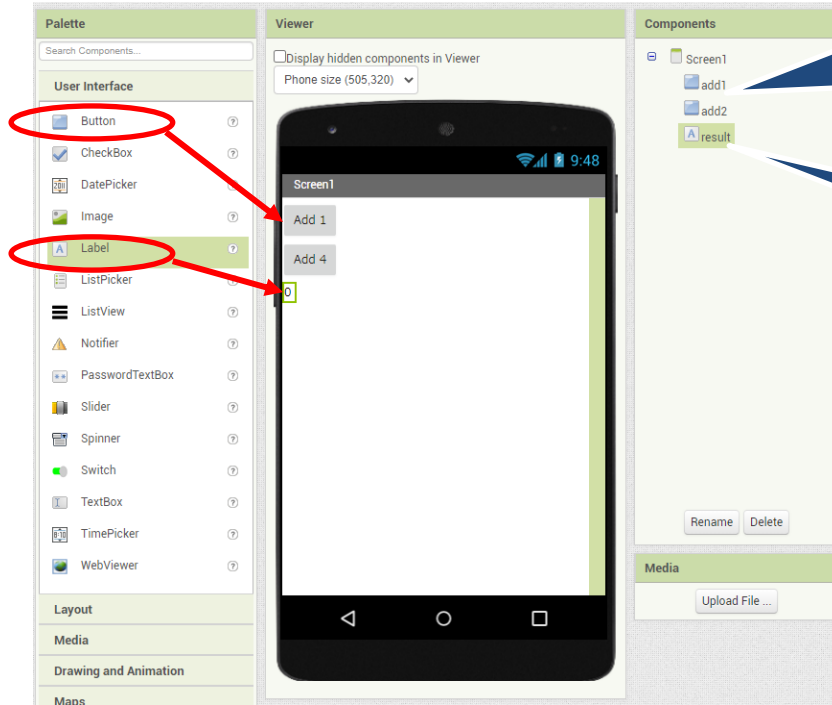
- ①ペーパーにアルコールを噴霧してください。
- ②アルコールが噴霧されたペーパーで、使用箇所（テーブル、椅子など）を拭き取ってください。
- ③使用済のペーパーは廊下のごみ箱に捨ててください。



I. Counter app with 'to-do' procedure



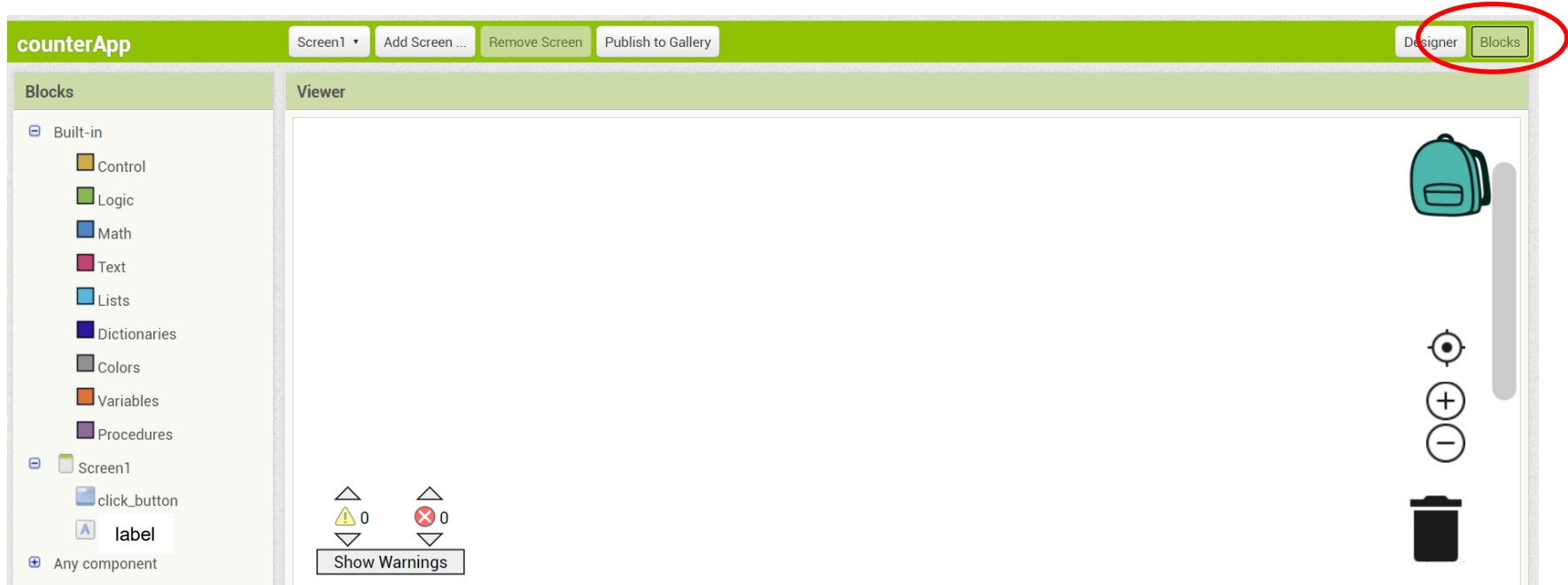
Build UI in designer view



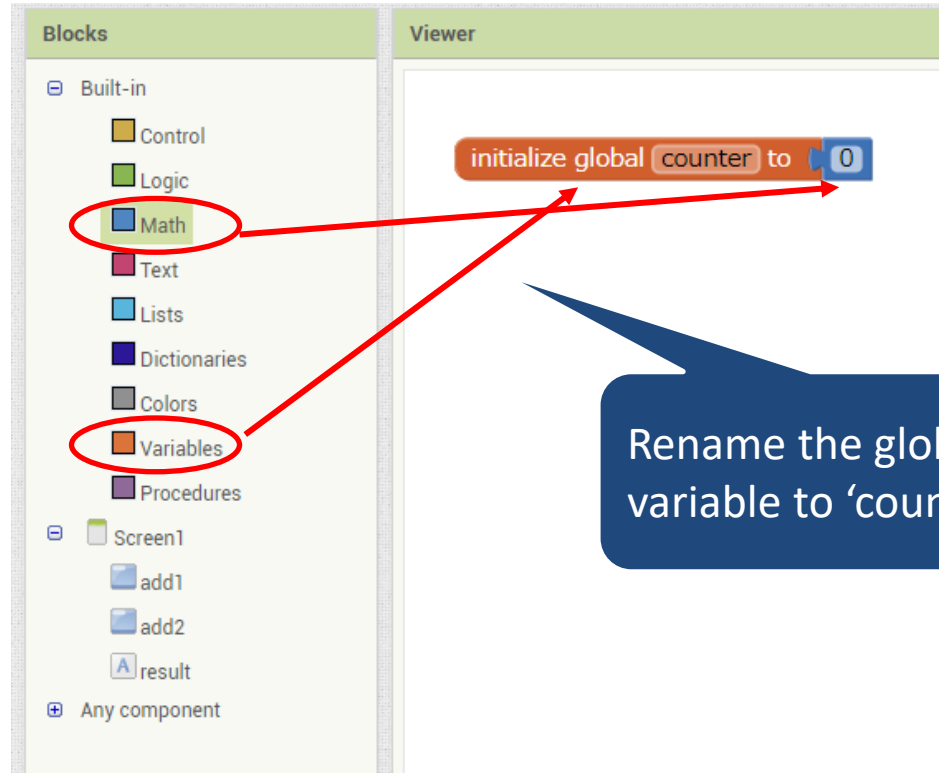
- Drag and drop two buttons
- Rename the buttons to 'add1' and 'add2'

- Drag and drop a label
- Rename the label to 'result'

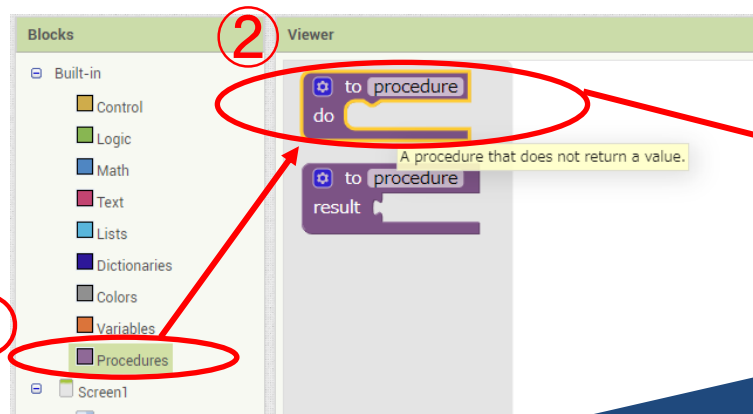
Switch to blocks view



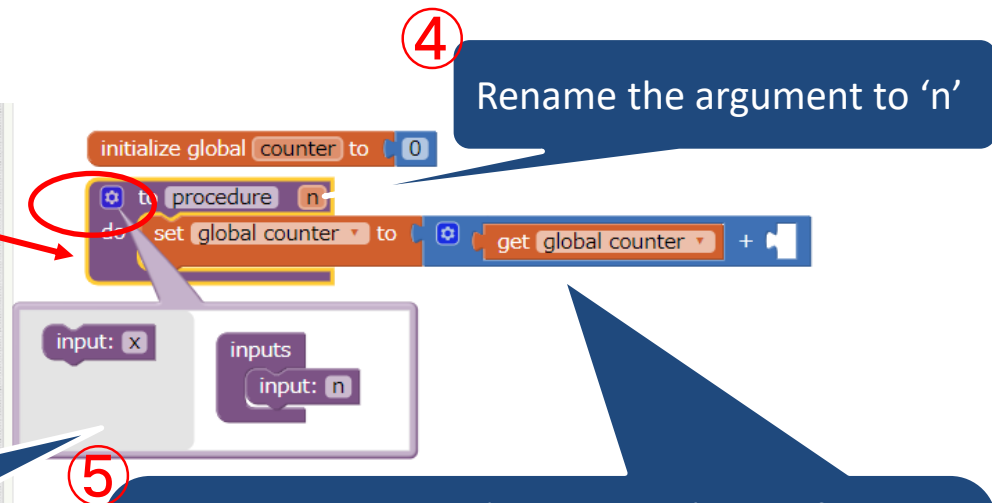
Initialize a global variable



Create a 'to-do' procedure

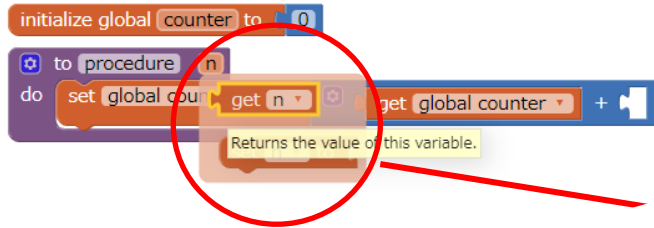


- 1
 - 2
 - 3
- Click on the mutator
 - Inside the mutator, add an argument by dragging an input block on the left side and dropping it inside the inputs block on the right side

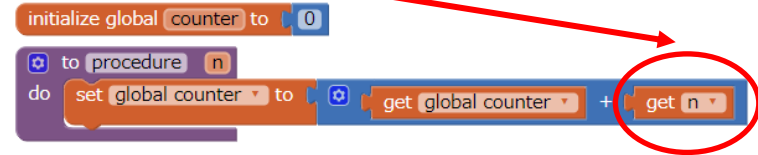


- 4
 - 5
- Drag and drop a 'set variable' block from 'Variables'
 - Drag and drop an 'add' block from 'Math'
 - Drag and drop a 'get 'variable value' block from 'Variables'

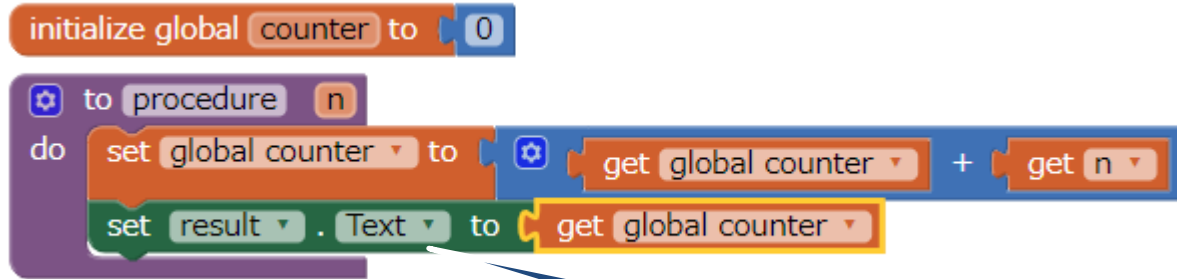
Create a 'to-do' procedure



- Hover mouse on the argument 'n'
- Drag the 'get' block and drop it inside the 'add' block

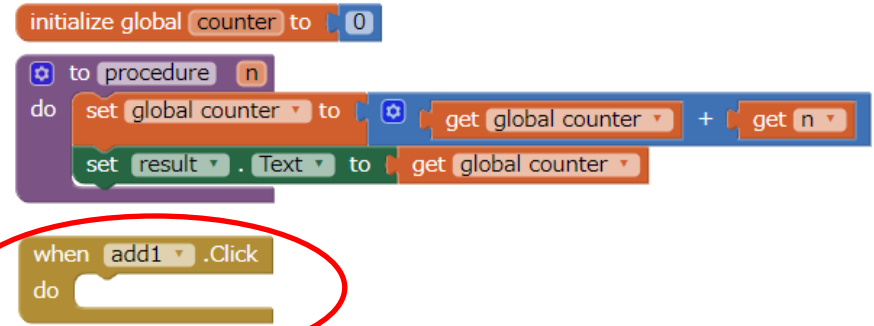
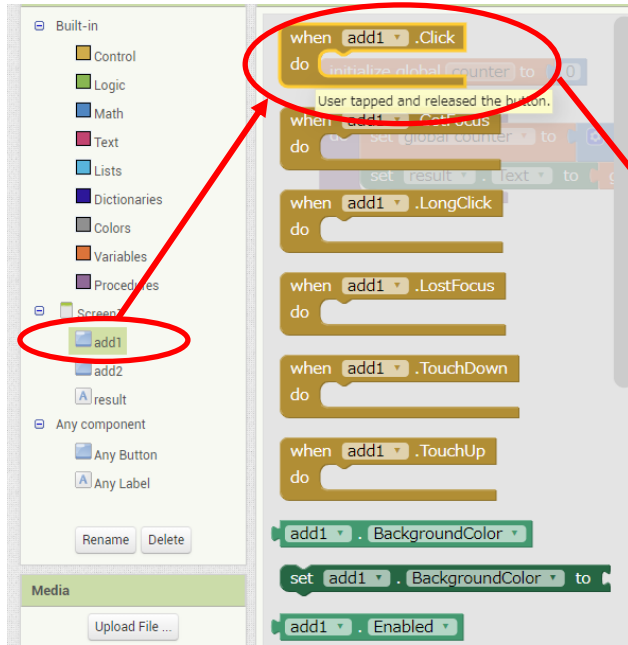


Create a 'to-do' procedure

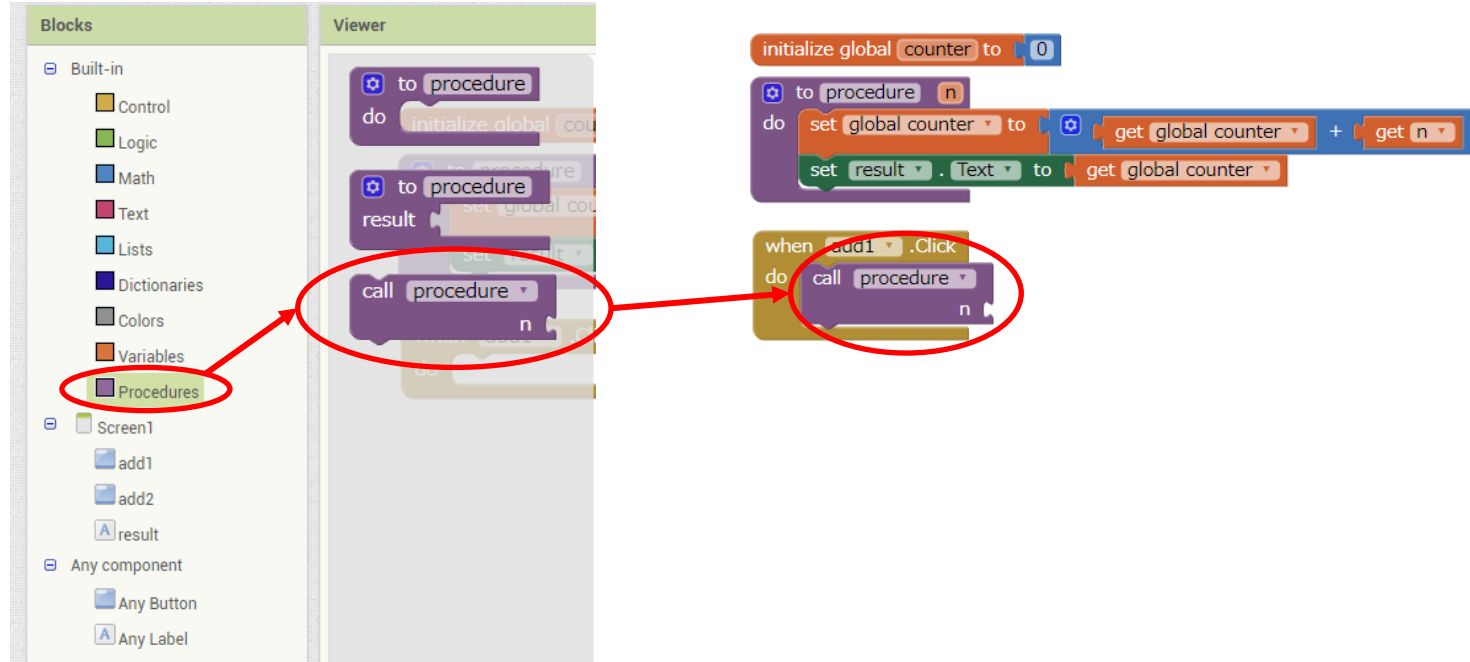


Set the result.text to the value of the global counter

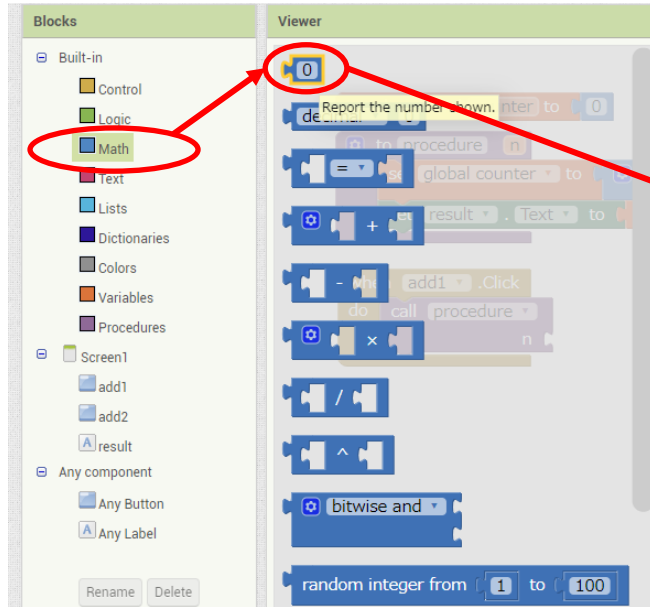
Add click handler to button 'add1'



Call the procedure in click handler



Set the procedure argument



Set it to 1

Add click handler to button 'add2'

The image shows a screenshot of an IDE with two main panels: 'Blocks' on the left and 'Viewer' on the right. In the 'Blocks' panel, under the 'Built-in' category, the 'add2' button is selected and circled in red. A red arrow points from this button to the 'when add2 .Click' block in the 'Viewer' panel, which is also circled in red. Another red arrow points from the 'when add2 .Click' block to a blue callout box on the right. The callout box contains the text: 'Add a number and set it to 4'. The 'Viewer' panel shows a sequence of blocks: 'initialize global counter to 0', 'to procedure n', 'set global counter to get global counter + get n', 'set result .Text to get global counter', 'when add1 .Click', 'do call procedure n 1', 'when add2 .Click', 'do call procedure n 4', and 'add2 .BackgroundColor'. The 'when add2 .Click' block is the focus of the red circle and arrow.

```
initialize global counter to 0
to procedure n
do
  set global counter to get global counter + get n
  set result .Text to get global counter
when add1 .Click
do
  call procedure n 1
when add2 .Click
do
  call procedure n 4
add2 .BackgroundColor
set add2 .BackgroundColor to
add2 .Enabled
```

Add a number and set it to 4

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
```

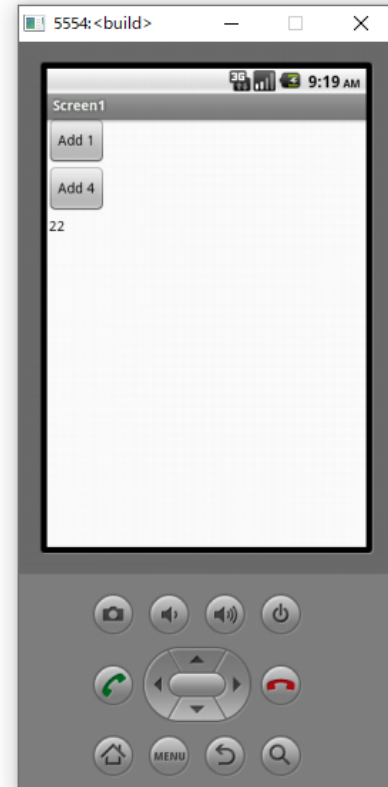
Test App on Emulator

```
initialize global counter to 0

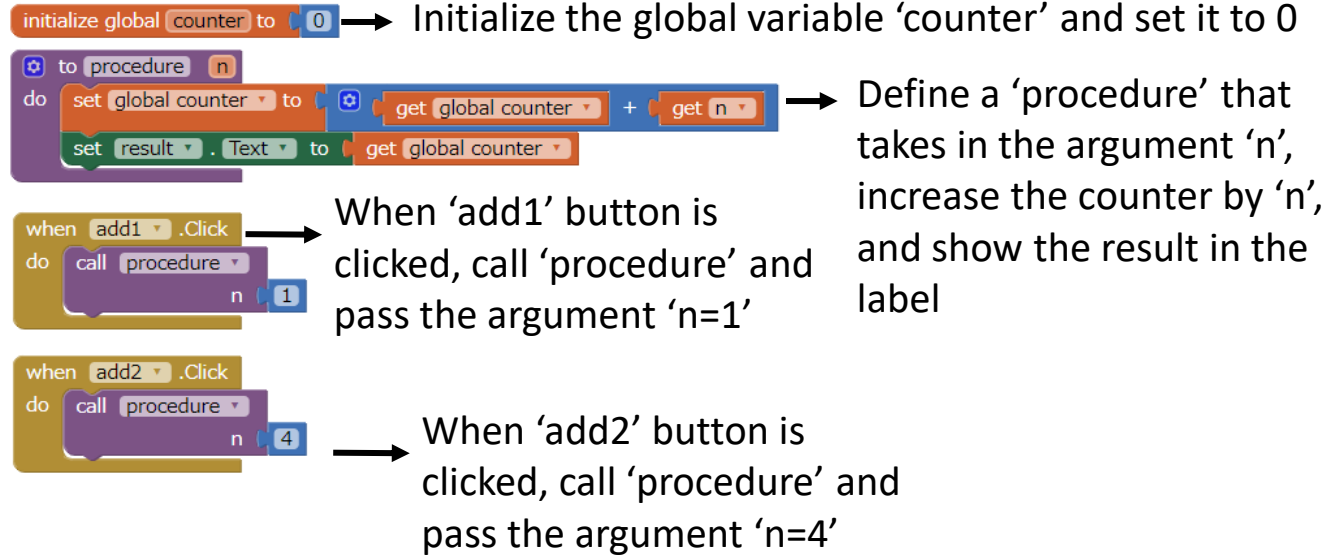
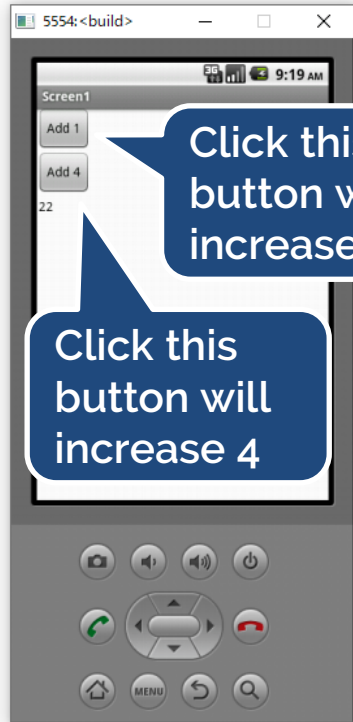
to procedure n
do
  set global counter to get global counter + get n
  set result . Text to get global counter

when add1 .Click
do
  call procedure n 1

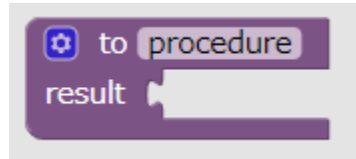
when add2 .Click
do
  call procedure n 4
```



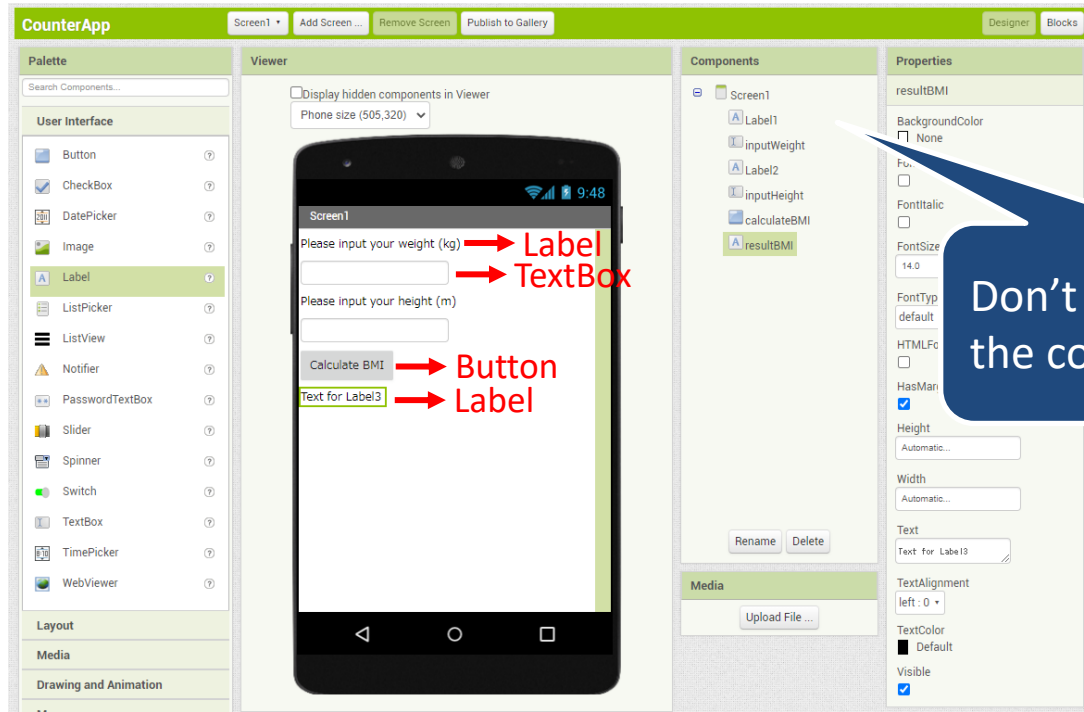
Code Anatomy: Counter App



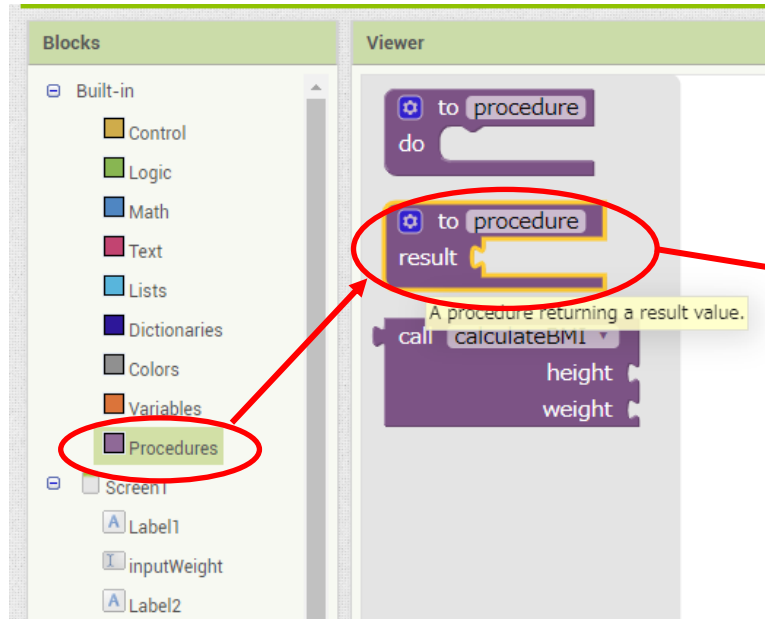
II. BMI calculator app with 'to-result' procedure



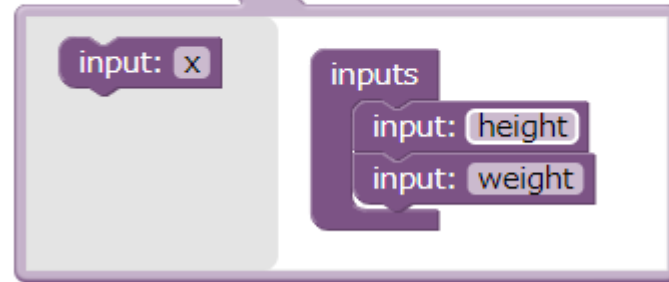
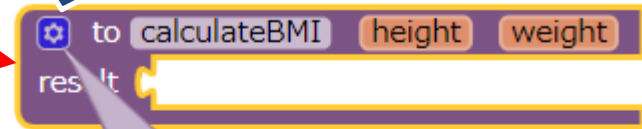
Build UI in designer view



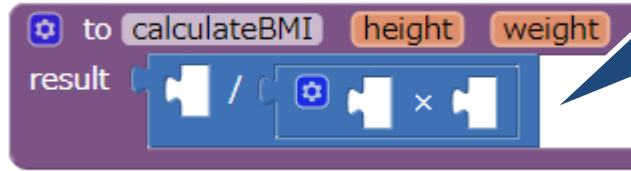
Create a 'to-result' procedure



- Rename the procedure to 'calculateBMI'
- Click the mutator and add two arguments
- Rename the arguments to 'height' and 'weight'

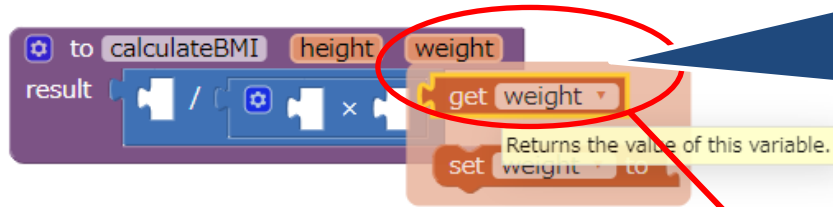


Create a 'to-result' procedure

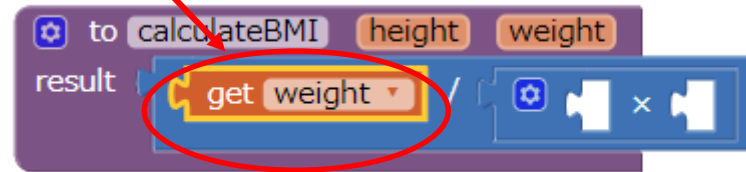


- Drag a division block from 'Math' and drop it inside the procedure
- Drag a multiplication block from 'Math' and drop it inside the denominator

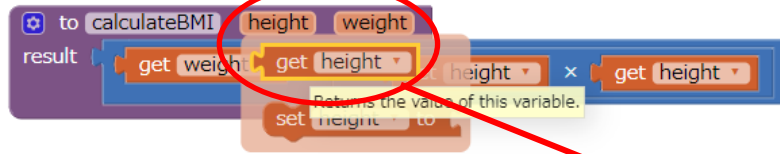
Create a 'to-result' procedure



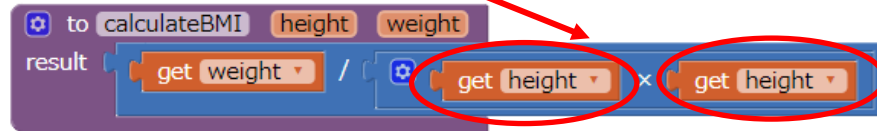
- Hover mouse on argument 'weight'
- Drag the 'get weight' block and place it inside the numerator



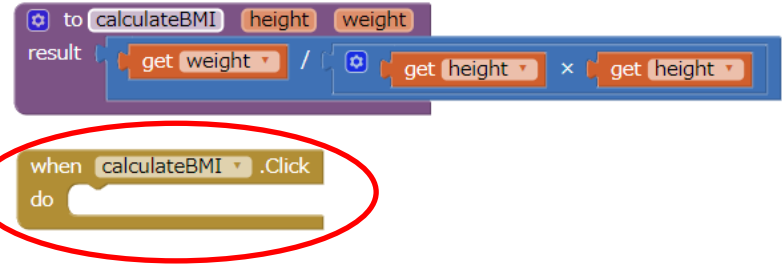
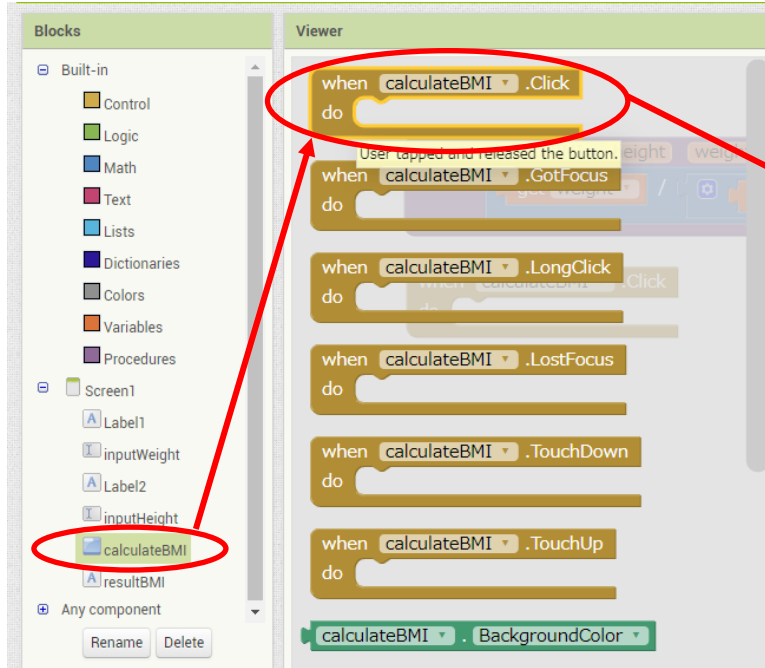
Create a 'to-result' procedure



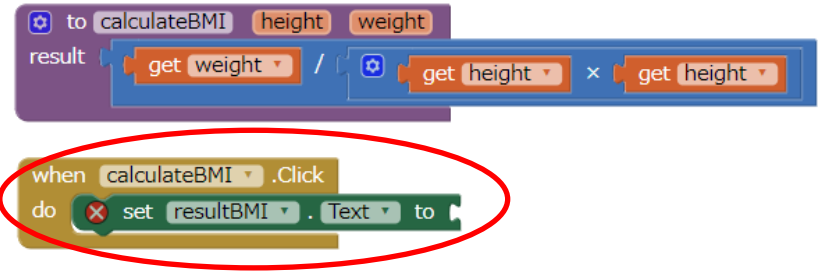
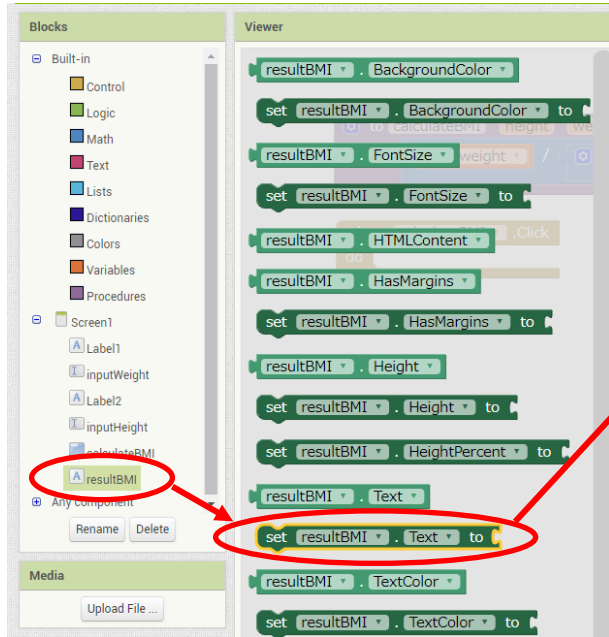
- Hover mouse on argument 'height'
- Drag the 'get weight' block and place it inside the denominator



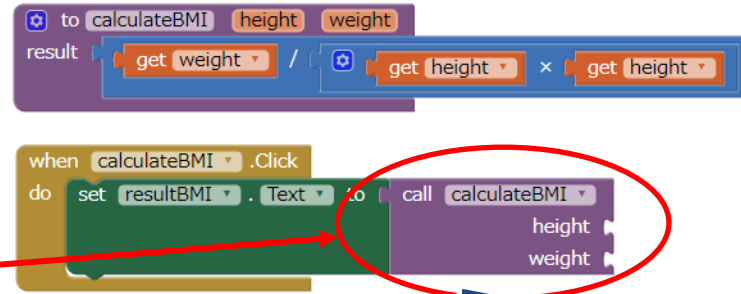
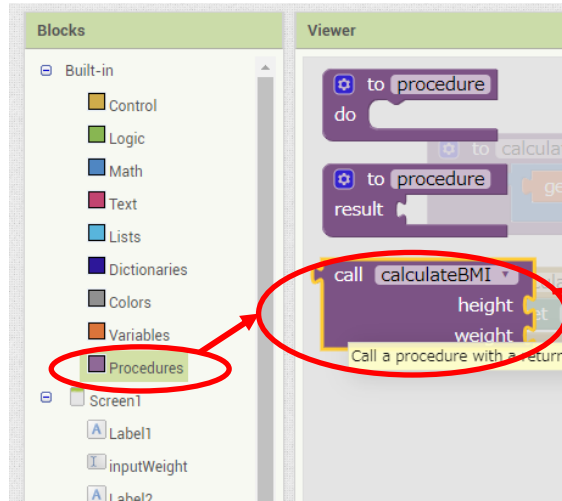
Add click handler to button 'calculateBMI'



Add click handler to button 'calculateBMI'

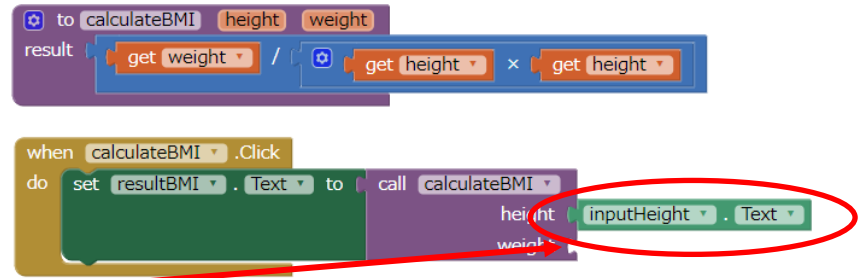
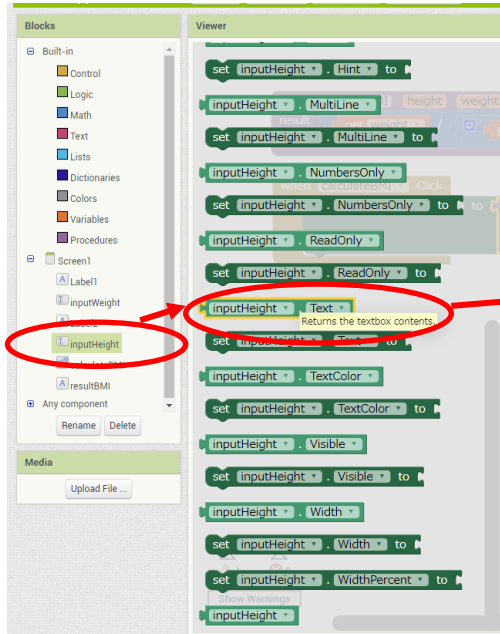


Add click handler to button 'calculateBMI'

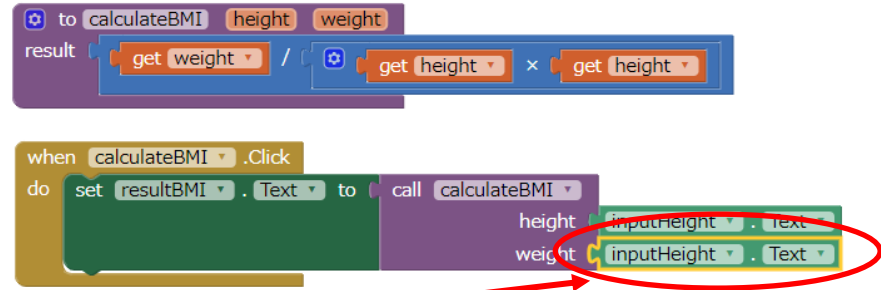
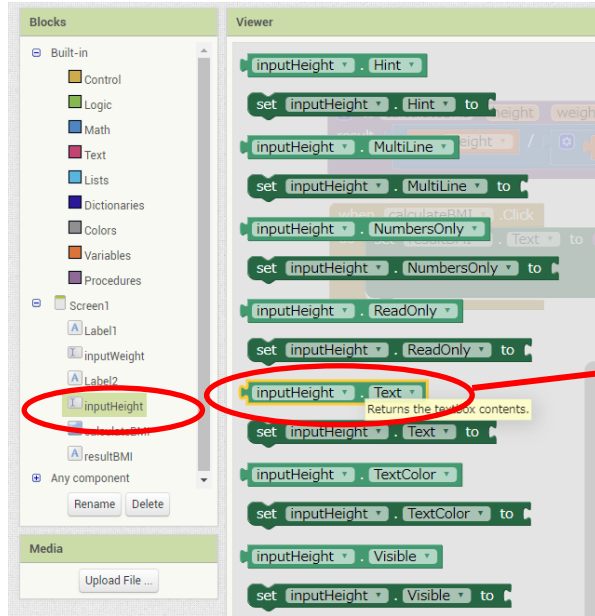


Call the 'calculateBMI' procedure and set the 'resultBMI.Text' to the return value.

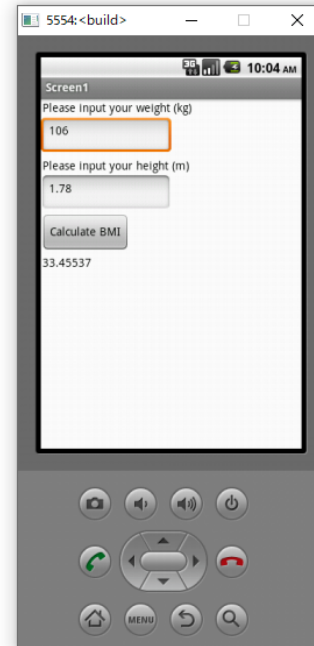
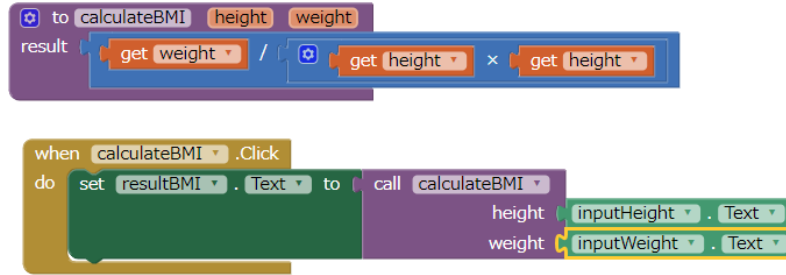
Get argument values from TextBox



Get argument values from TextBox



Test on Emulator



Code Anatomy: BMI Calculator App

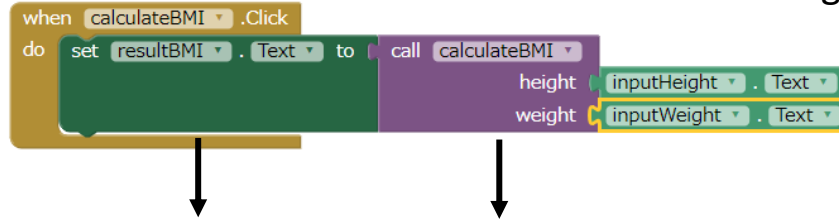


A user needs to input weight and height

Click this button will calculate BMI



Define a 'calculateBMI' procedure that takes in the argument 'height' and 'weight' to calculate BMI



3. Set the 'resultBMI' text to the result returned from the 'calculateBMI' procedure

2. Call the 'calculateBMI' procedure and pass the two arguments 'weight' and 'height', and return the result value to the block on the left

1. Set the 'weight' and 'height' arguments to the values that a user input in the textboxes

Assignment

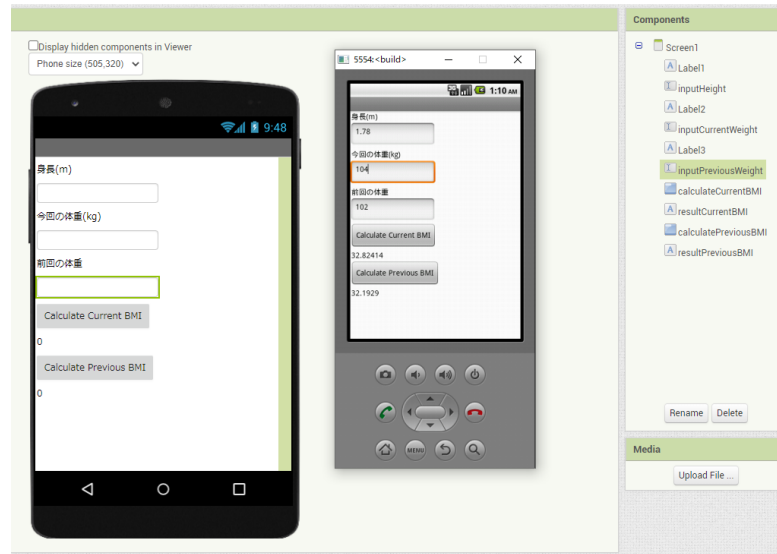
- Complete the hands-on tasks in the tutorial
 - ✓ If you finish all the steps in class, show your Counter App and BMI Calculator App to one of the instructors before you leave
 - ✓ If you cannot finish all the steps, you can work on them after class and show your Apps to one of the instructors in the class next week

Assignment (Optional)

If you have time, why not trying to add more features to the BMI Calculator app!

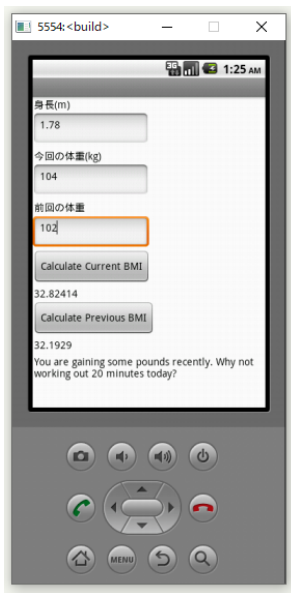
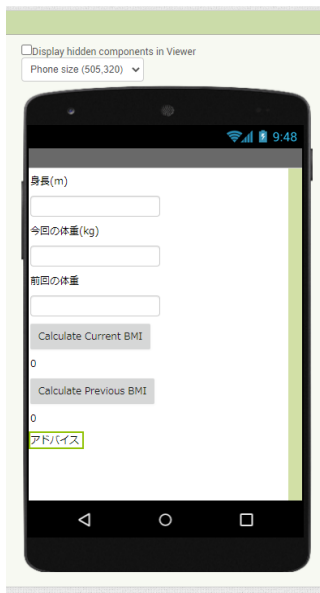
1. Additional feature 1: calculate previous BMI

- Add a TextBox that allows user to input their previous body weight
- Add a button 'Calculate Previous BMI', so that when a user clicks this button, the app calculates the previous BMI and show it below the button (you must use the 'calculateBMI' procedure in the click handler)



Assignment (Optional)

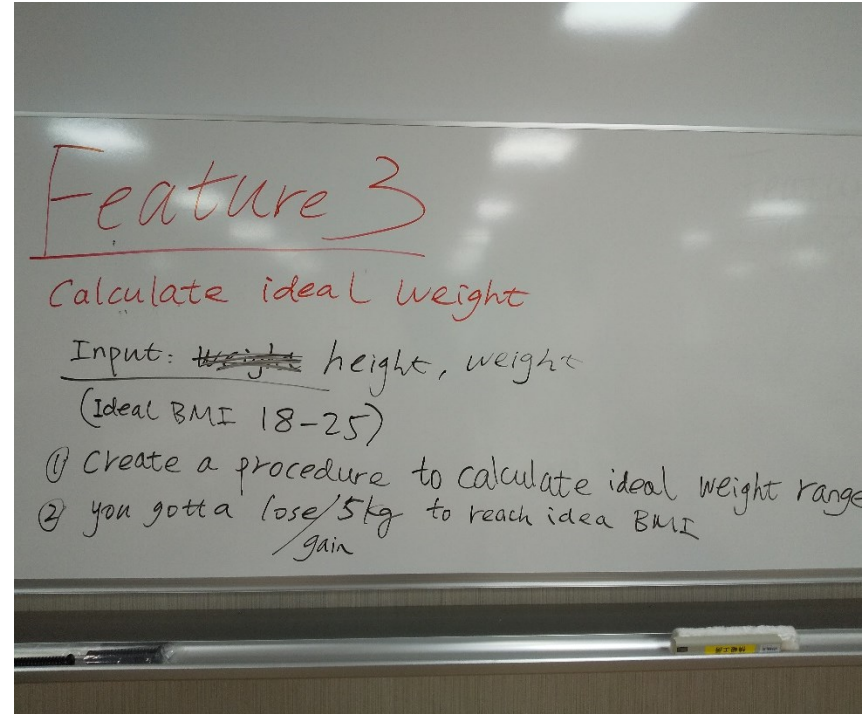
2. Feature 2: show a simple advice based on the comparison of current weight and previous weight
(Hint: you need to use the 'if-then-else if-then-else' block in the drawer of 'Control')



Assignment (Optional)

3. Feature 3: Calculate the ideal weight range

- (1) Create a procedure to calculate ideal weight range based on a user's height
- (2) Provide advice like 'another 5 kg to lose/gain before reaching the idea BMI'





KYOTO UNIVERSITY of ADVANCED SCIENCE

京都先端科学大学