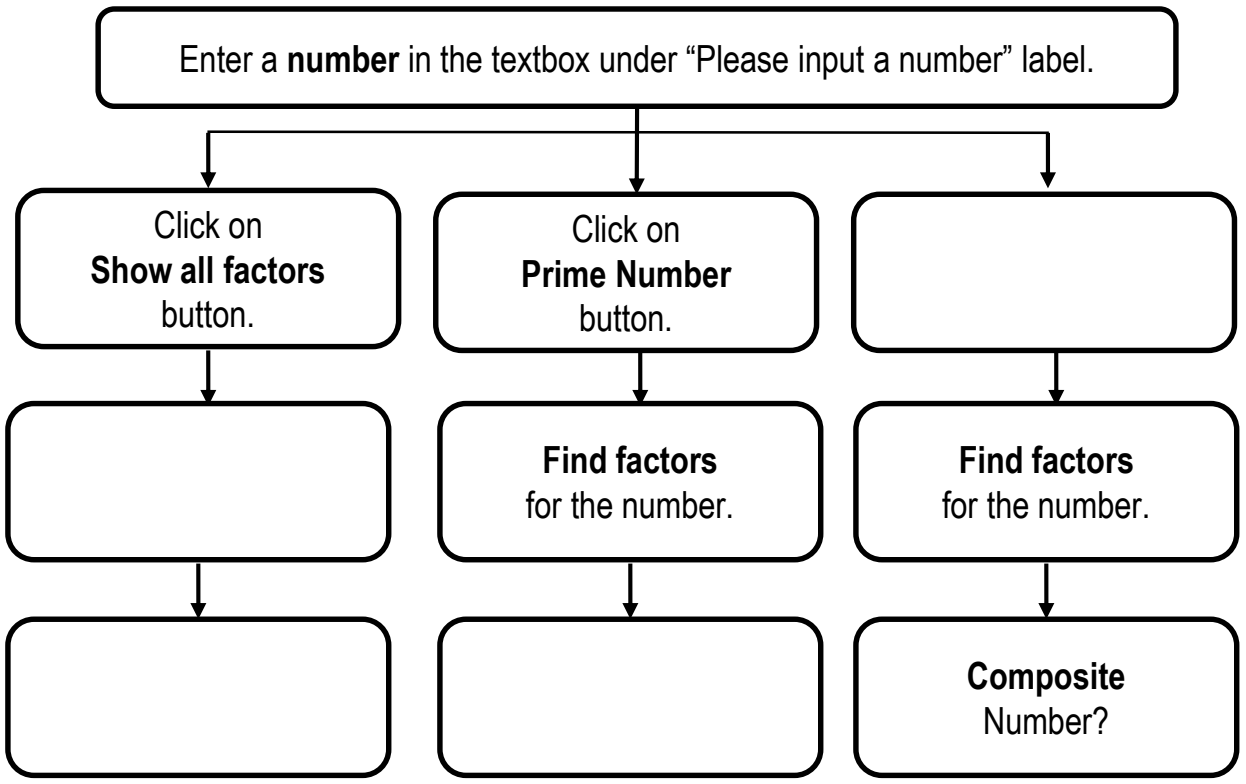
FACTOR APP

In this lesson, you will start to code the Factor App that helps users test their skills with prime numbers and factoring.

FLOW AND LOGIC

❑ Let's review the program flow below. Check that you understand the sequence of steps for the Factor App. Fill in the empty spaces with A, B, C, or D.

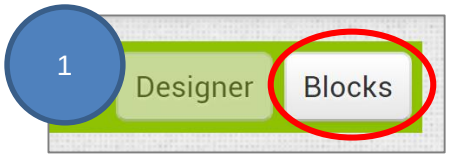
A. **Prime** Number?	B. Show all factors for the number.
C. Click on **Composite Number** button.	D. **Find factors** for the number.



FACTOR APP

LET'S START TO CODE

❑ In MIT App Inventor, open the FactorApp_Template project, and then switch to the Blocks Editor.



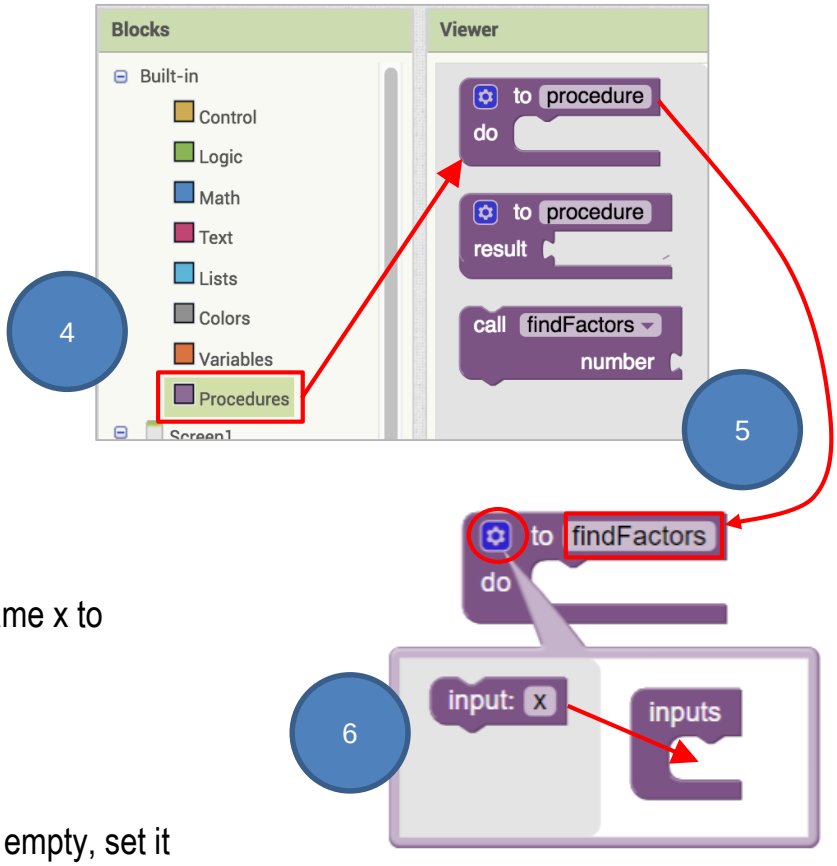
❑ Make a new variable, called "factorList" and initialize it to an empty list.

FACTOR APP

FIND FACTORS

Let's make a procedure to find all the factors of a number.

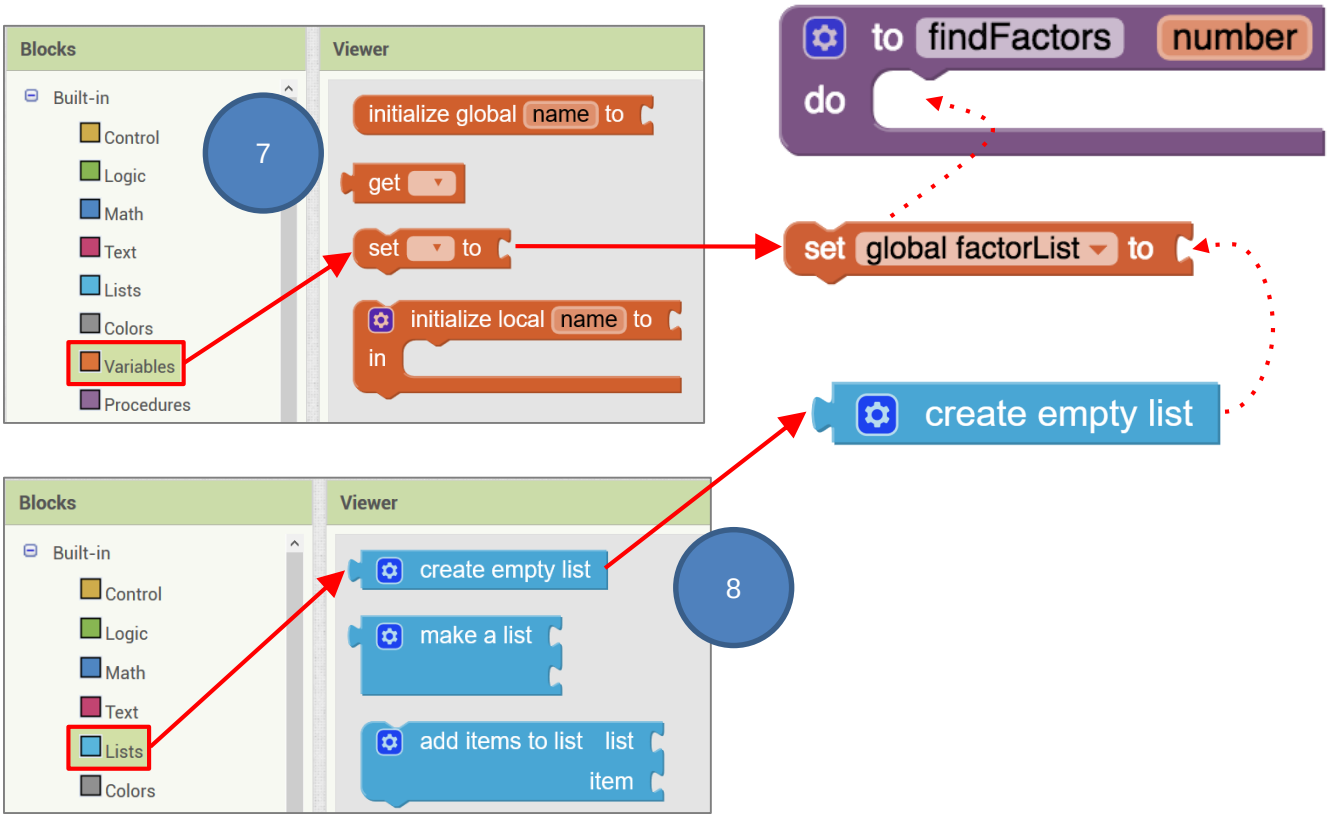
❑ Drag out a new procedure block.



❑ Name the procedure "findFactors".

❑ Add an input to the procedure and rename x to "number".

❑ To make sure your factorList starts off empty, set it to an empty list in the "findFactors" procedure.

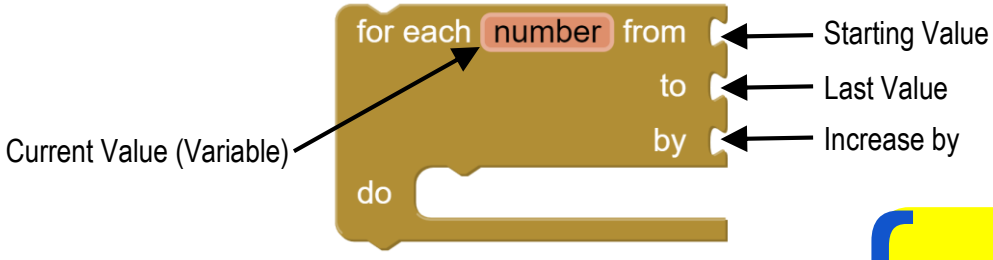


FACTOR APP

FIND FACTORS (CONT'D)

You need to check every number from 1 to the number itself, to see if it's a factor.

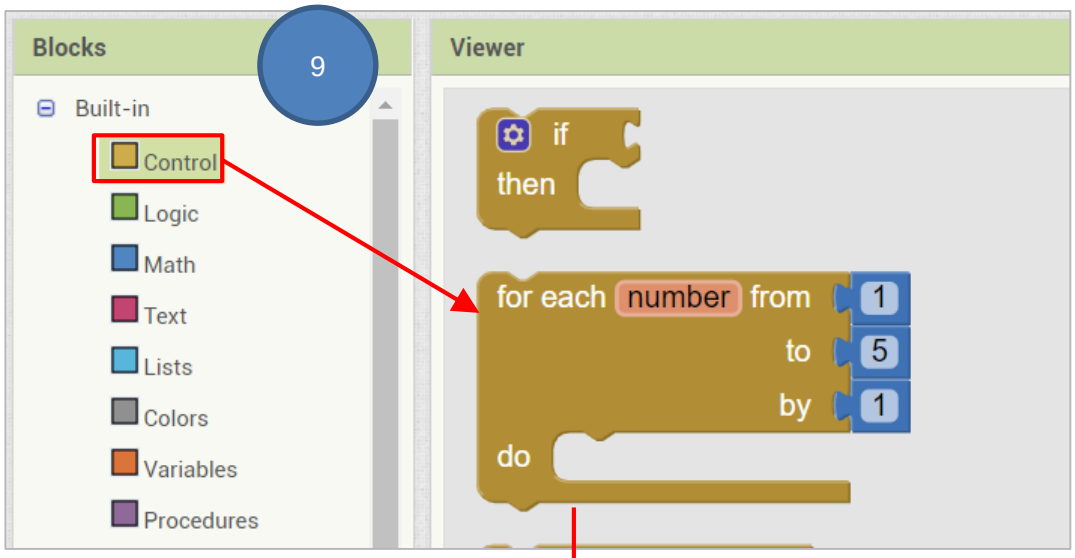
You can do this easily with a for loop.



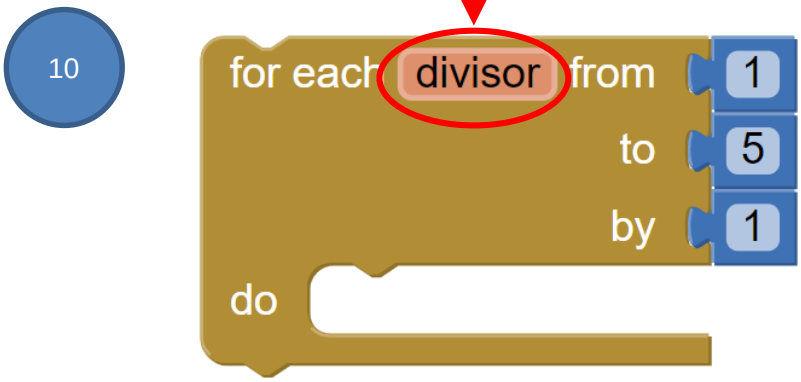
CT Tips

Use **repetition** with the for each number block in the "findFactors" procedure.

❑ Drag out a **for each number** block from the Control Drawer.



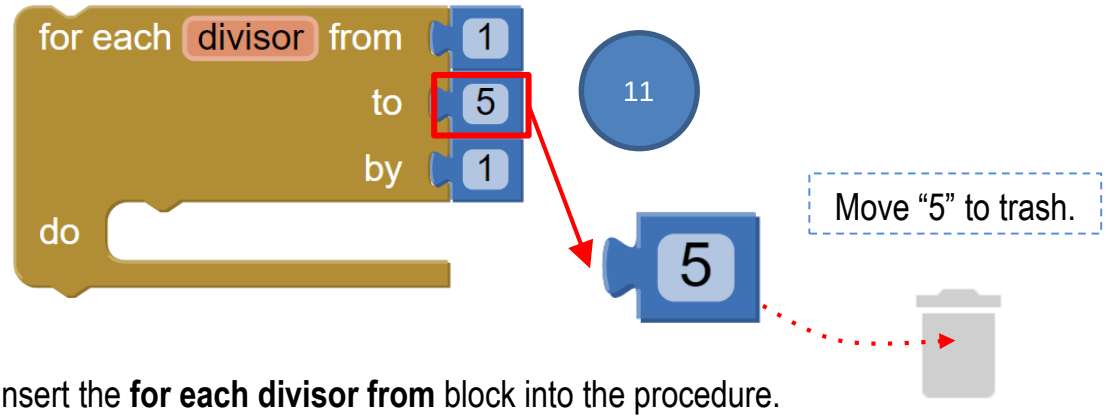
❑ Change "number" to "divisor".



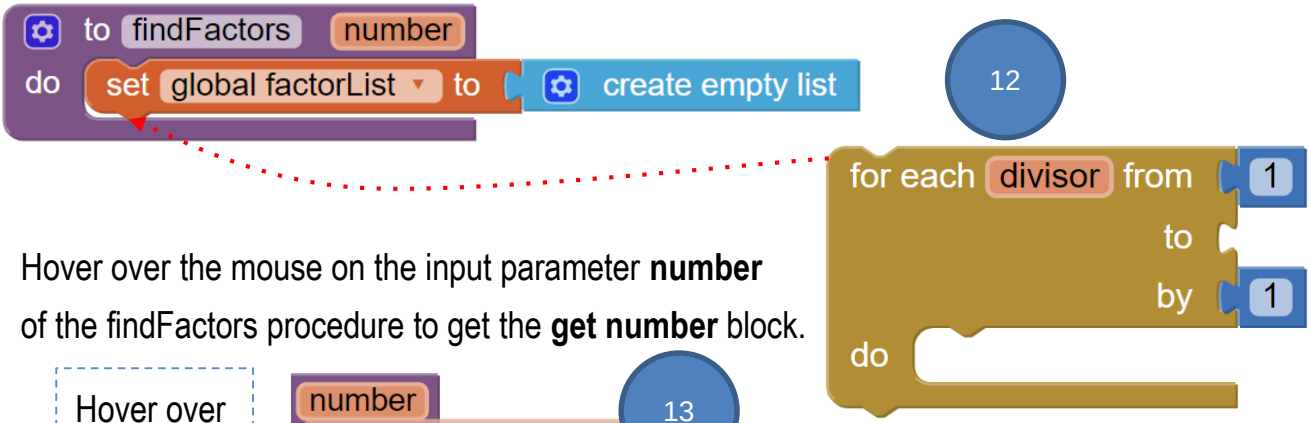
FACTOR APP

FIND FACTORS (CONT'D)

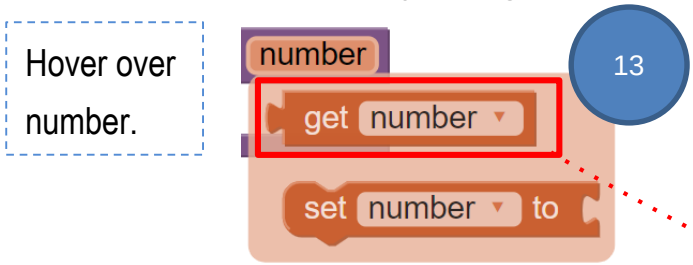
❑ Drag out the number **5** and drag it to the trash.



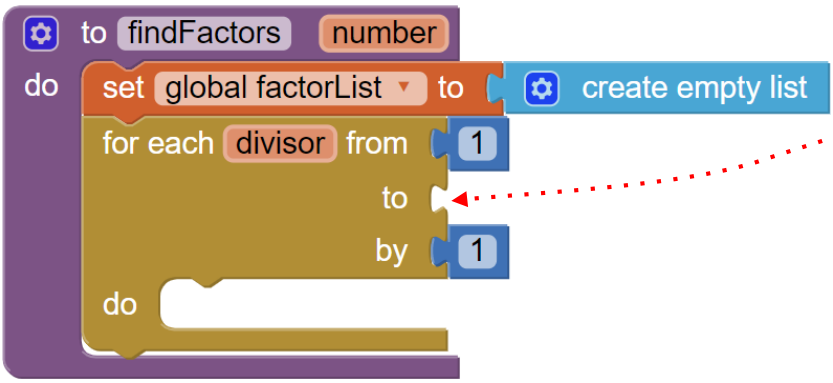
❑ Insert the **for each divisor from** block into the procedure.



❑ Hover over the mouse on the input parameter **number** of the findFactors procedure to get the **get number** block.



❑ Insert the **get number** block in the to slot of the **for each divisor from** block.

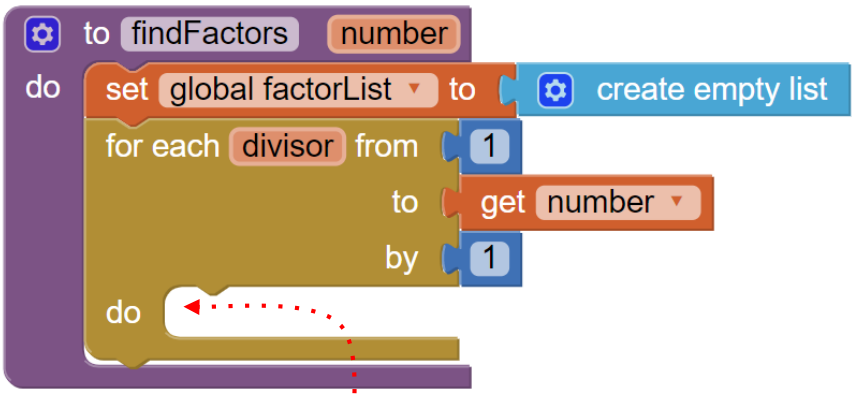


Inputs to the **for** loop are
- ❑ *from* 1
- ❑ *to* **get number**
- ❑ *by* 1

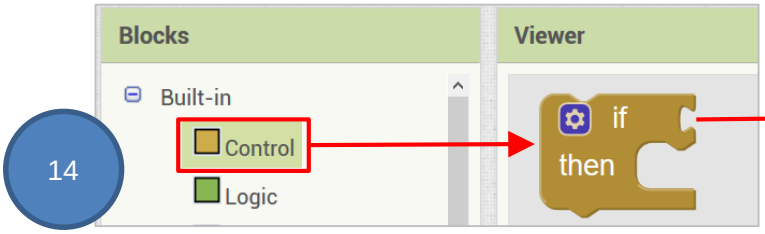
FACTOR APP

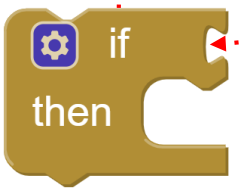
FIND FACTORS (CONT'D)

To test if a divisor is a factor of the number, you need to check if the remainder is zero.



❑ Add an **if-then** block to the **for each divisor from** block.





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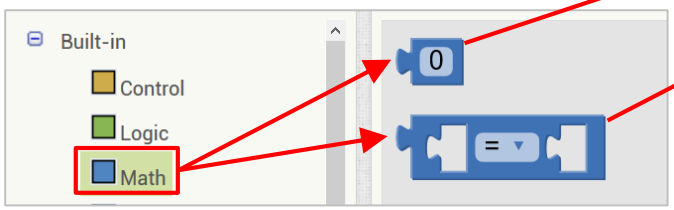
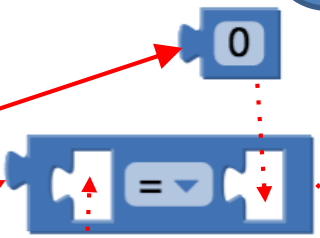
❑ Drag out an **equal to,** a zero **0** block, and **remainder of** block from the Math drawer.





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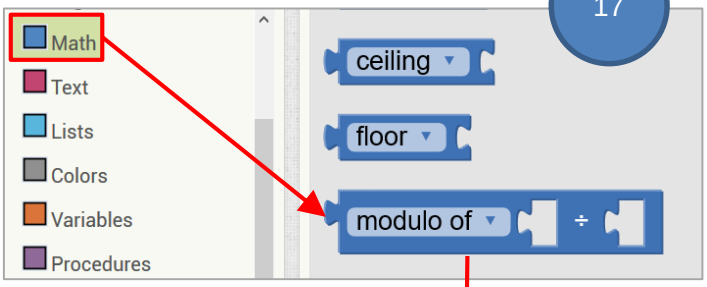

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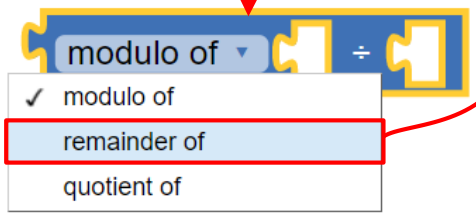

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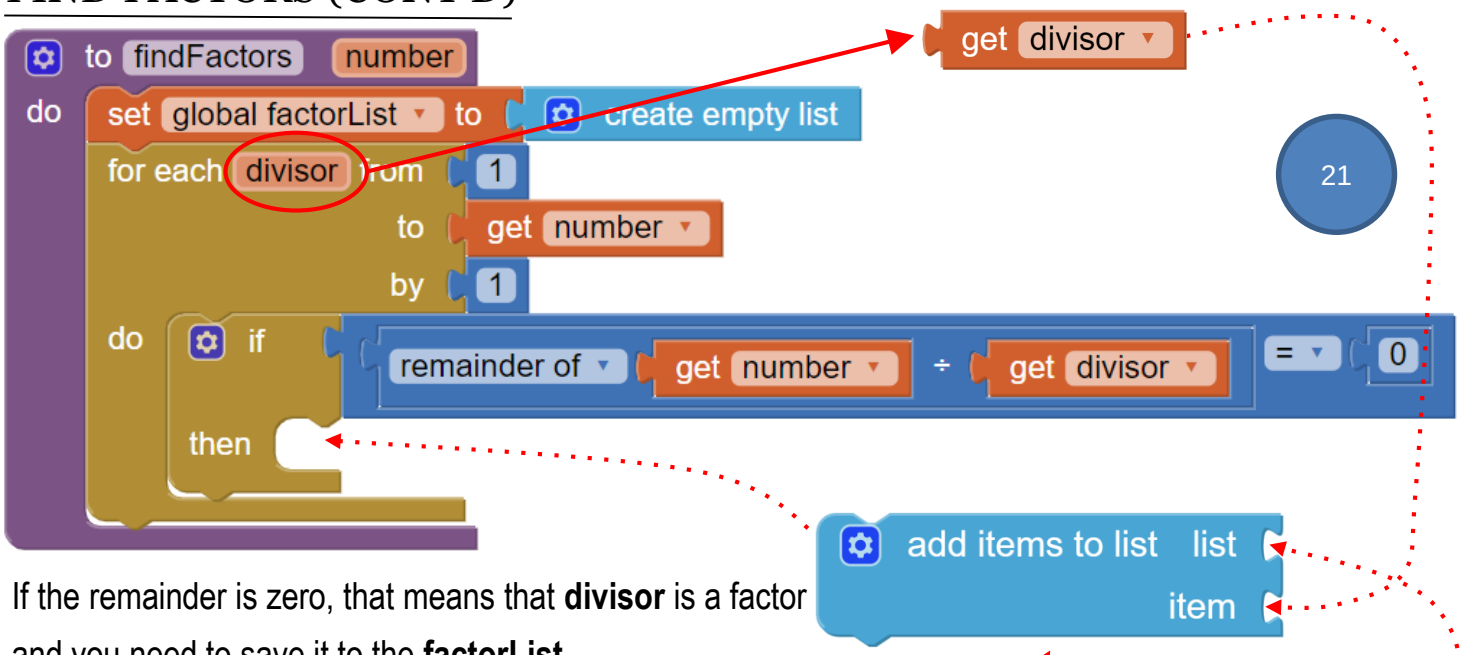
Do you know where the **get number** and **get divisor** blocks go in the **remainder of** block?

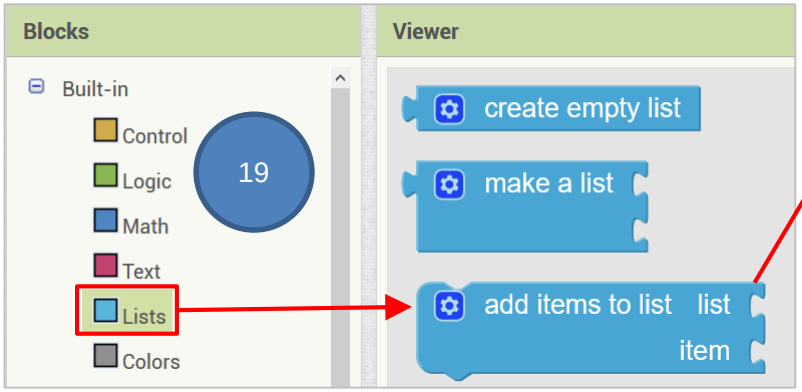
FACTOR APP

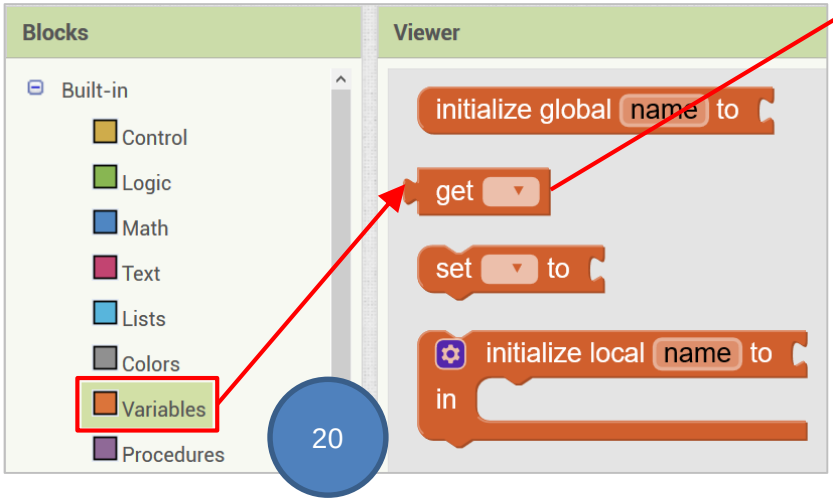
FIND FACTORS (CONT'D)



If the remainder is zero, that means that **divisor** is a factor and you need to save it to the **factorList**.

❑ Drag an **add items to list** block and snap it into **then**.





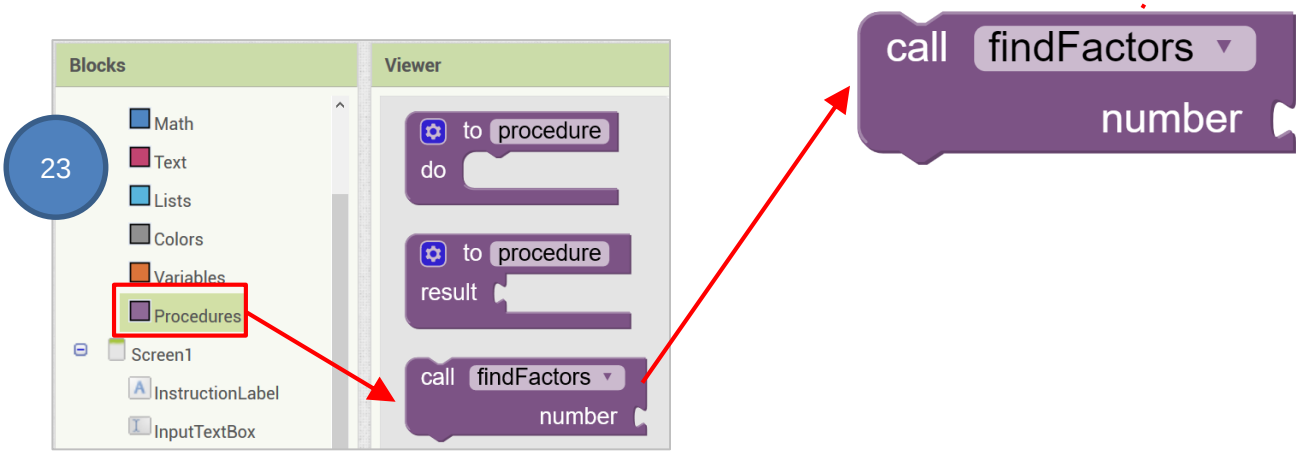
FACTOR APP

SHOW BUTTON

When the user clicks on the **ShowButton**, you need to show the factors stored in factorList using the **findFactors** procedure.

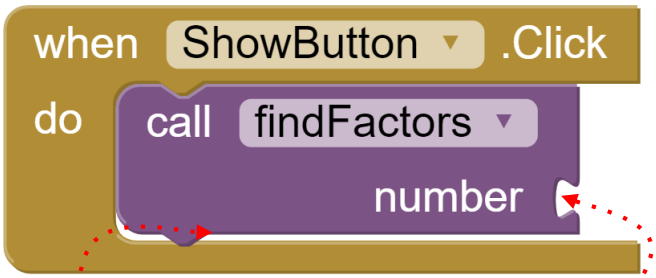
❑ Pull out the **when ShowButton.Click** block from the ShowButton drawer.

❑ Pull out a **call findFactors** block from the Procedures drawer.

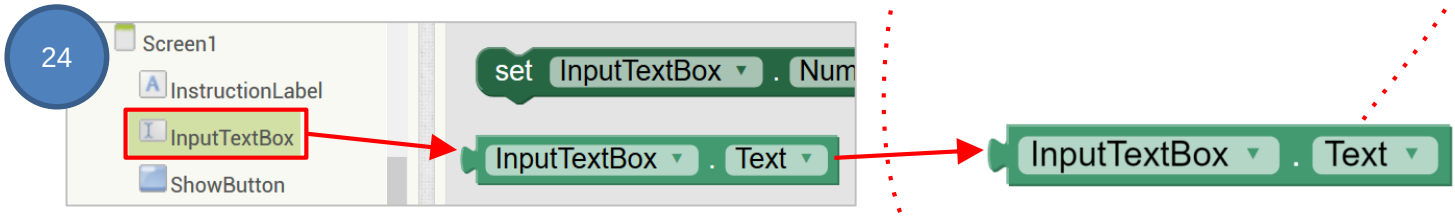


FACTOR APP

SHOW BUTTON (CONT'D)

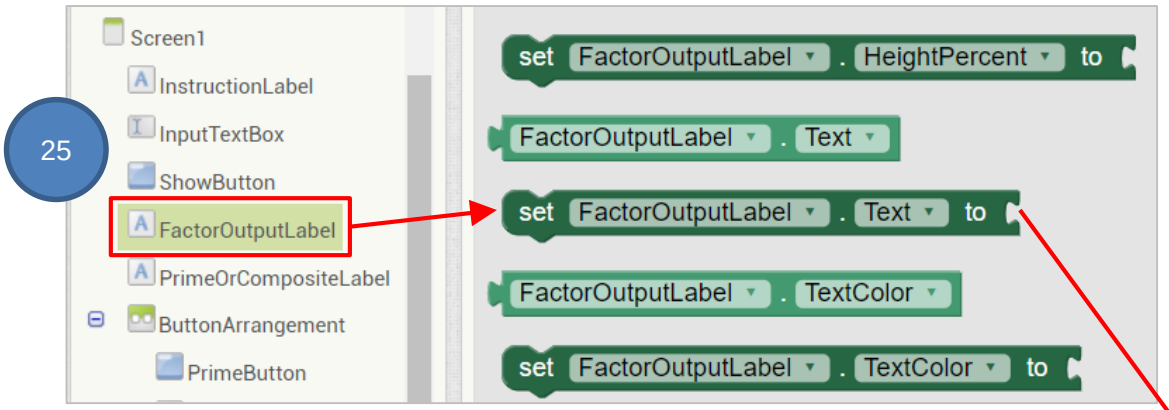


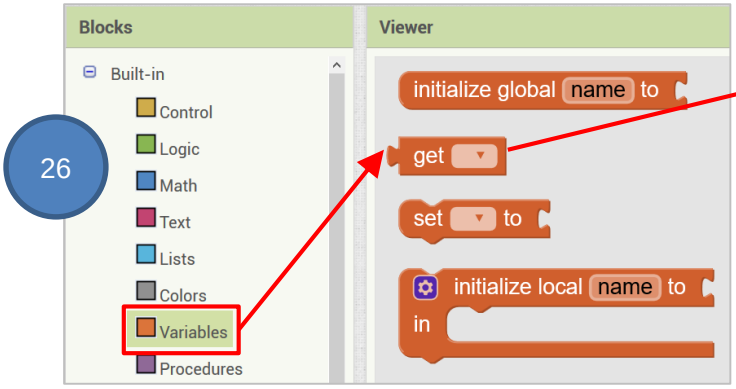
❑ Pull out the **InputTextBox.Text** block from the InputTextBox drawer and add the **InputTextBox.Text** block as the input **number**.



Display the list of factors that were stored.

❑ Pull out the **set FactorOutputLabel.Text to** block from the FactorOutputLabel drawer and attach a **get global factorList** block to it.





❑ Test using MIT AI2 Companion.
Type in a number and press ShowButton.
Do all the factors appear correctly?

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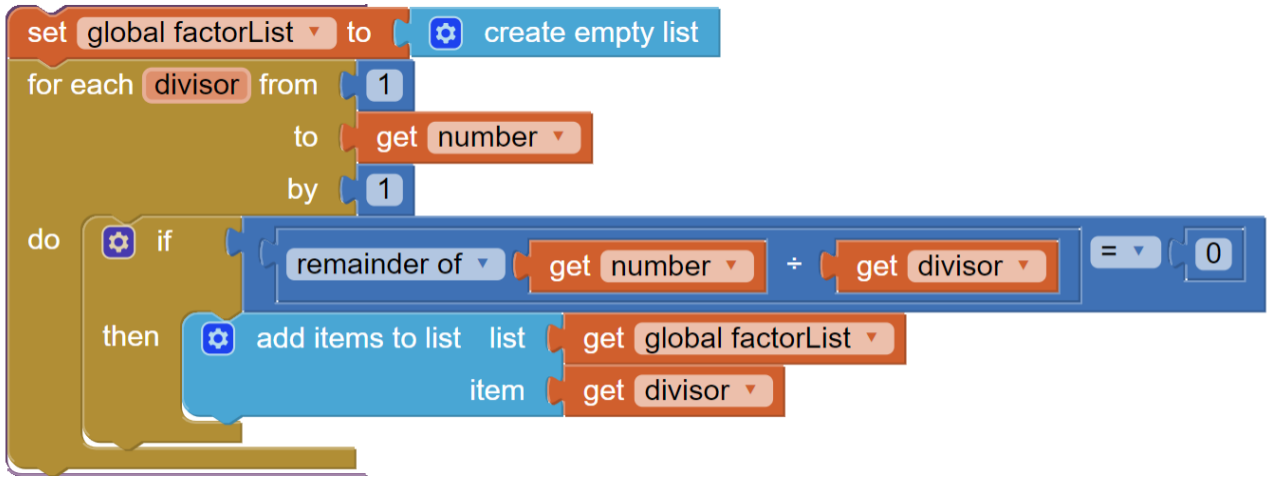
FACTOR APP

COMPUTATIONAL THINKING CONCEPTS

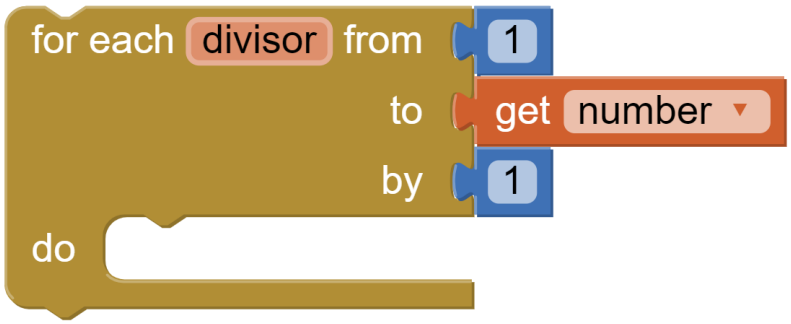
The following are the Computational Thinking Concepts learnt in Lesson 3.

L3U8.4-8.5 Factor App

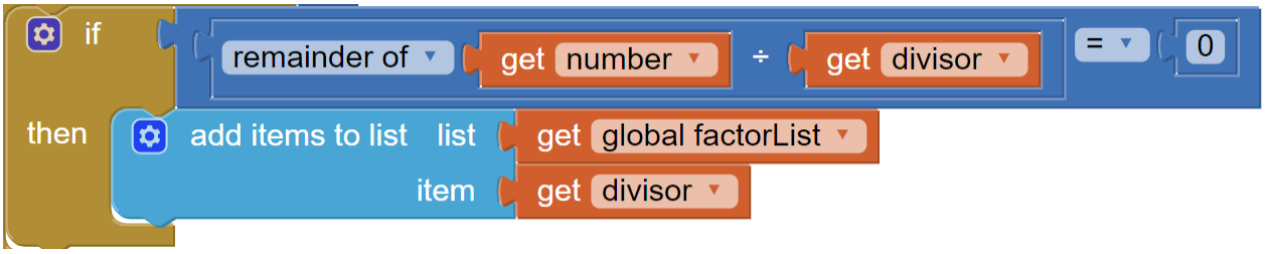
1. Sequences



2. Repetition



3. Conditionals



FACTOR APP

COMPUTATIONAL THINKING CONCEPTS

The following are the Computational Thinking Concepts learnt in Lesson 3.

L3U8.4-8.5 Factor App
4. Naming / variables 
5. Operators 
6. Manipulation of data and elementary data structures