

CHAPTER 3

Input, Variables, and Calculations

starting out with >>> **APP INVENTOR**
FOR ANDROID



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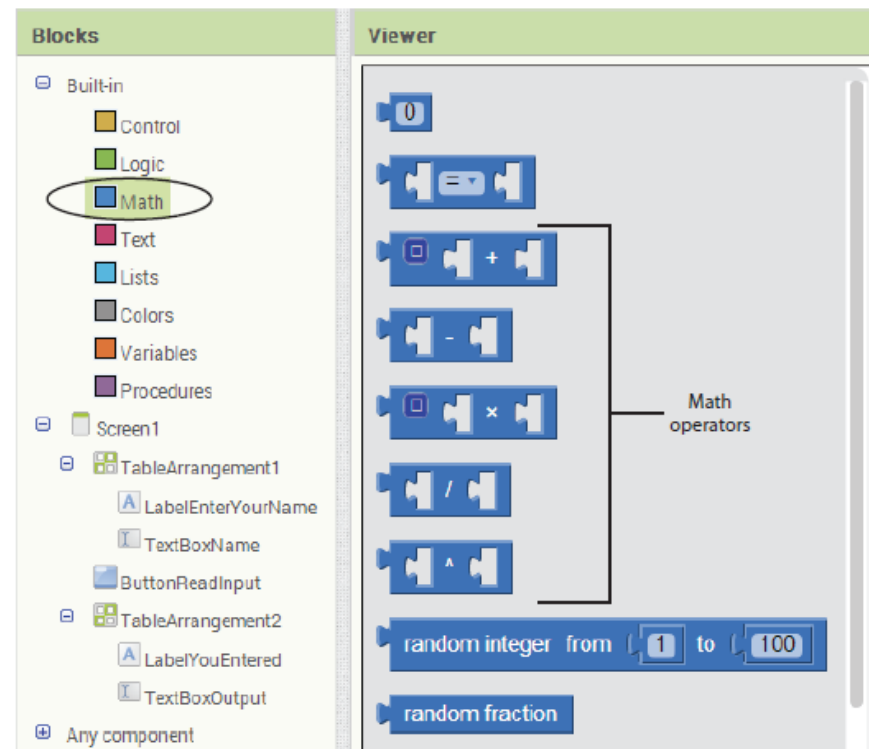
Performing Calculations

- You can use math operators to write expressions that perform simple calculations. The result of a math expression can be assigned to variable.
- A programmer's tool for performing calculations are the *math operators*.

Performing Calculations






In the Block's Editor, you will find the math operators by going into the *Built-in* section, then opening the *Math* drawer. There are four math operator blocks shown in Table 3-1.

Figure 3-8 The Math Operator Blocks (Source: MIT App Inventor 2)



Performing Calculations

Table 3-1 Math Operator Blocks (Source: Pearson Education, Inc.)

Operator	Name of the Operator	Description
	Addition	Adds two numbers and gives the result
	Subtraction	Subtracts one number from another and gives the result
	Multiplication	Multiplies one number by another and gives the result
	Division	Divides one number by another and gives the result
	Exponent	Raises one number to the power of another number and gives the result.

Performing Calculations

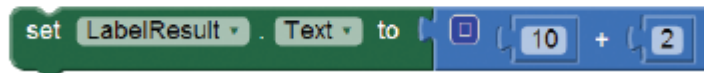
- Each of the operator blocks has its mass symbol displayed in the center with two sockets.
- The two sockets are used to hold *operands*.

Figure 3-9 Using the + Operator Block (Source: MIT App Inventor 2)



- We have to plug the + operator block into another block.
- Figure 3-10 shows how we can set the label's *Text* property to the value of the + operator block.

Figure 3-10 Displaying the Result of the + Operator in a Label (Source: MIT App Inventor 2)

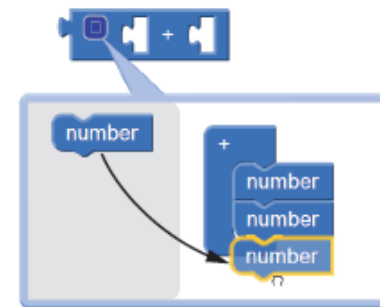


Performing Calculations

Mutator Blocks

- The $+$ and \times operator blocks have a blue box (□) in their upper-left corner.
- The block is a *mutator* block.
- Click the blue box (□) that appears in the block's upper-left corner.
- This causes the bubble shown in Figure 3-18 to appear.
- Click and drag the number block (number) from the left side of the bubble.

Figure 3-19 Adding an Additional Operand (Source: MIT App Inventor 2)



Performing Calculations

Figure 3-20 The + Block with Three Operands (Source: MIT App Inventor 2)

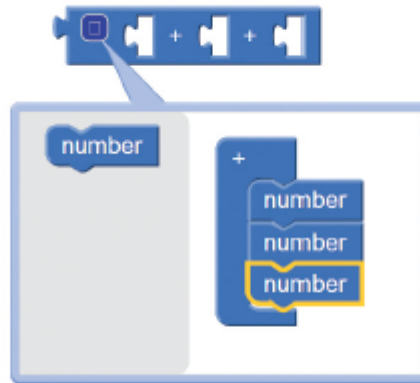


Figure 3-21 The + Block with Three Operands (Source: MIT App Inventor 2)

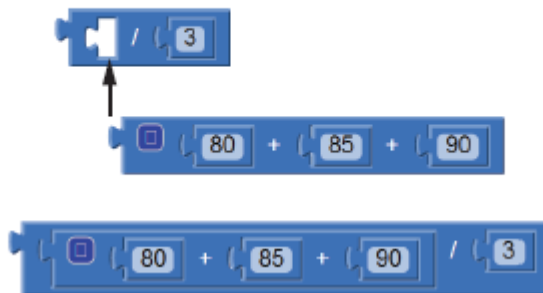


Performing Calculations

Combining Operator Blocks

- You can combine operator blocks to create more complex expressions.
- Figure 3-23 shows how to create the expression by combining a $+$ block with a $/$

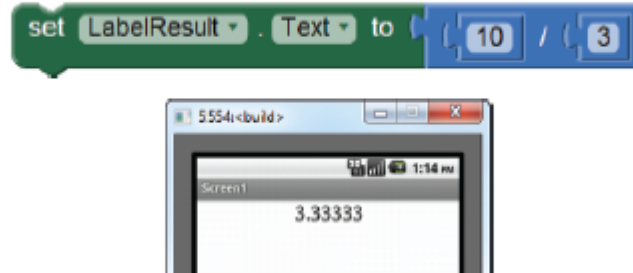
Figure 3-23 Calculating the Average of 80, 85, and 90 (Source: MIT App Inventor 2)



Performing Calculations

Formatting Numbers to a Specified Number of Decimal Places

Figure 3-24 Displaying the Result of $10/3$ (Source: MIT App Inventor 2)

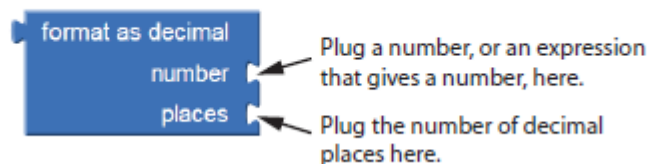


Performing Calculations

Formatting Numbers to a Specified Number of Decimal Places

- You can round a number to a specified number of decimal places using *format as decimal*.

Figure 3-25 The `format as decimal` Block (Source: MIT App Inventor 2)



Performing Calculations

Formatting Numbers to a Specified Number of Decimal Places

- The *number* socket requires a *number* or an expression that gives the number. It is the value that you want to round.
- The *places* socket requires the number of decimal places.

Figure 3-26 Rounding the Result of $10/3$ to one decimal place
(Source: MIT App Inventor 2)



Performing Calculations

Terminology: Functions, Calling Functions, and Passing Arguments

- A *function* is a method that performs an operation and then *returns* a value.
- When you *execute* a function, we say that you are *calling* it.
- Often functions require additional pieces of data in order for the function to operate.
- When we provide *arguments* to a function, we say that we are *passing the arguments* to the function.