Activity 1.2.3 Procedural Abstraction: Price per Slice

PLTW | Computer Science

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Create a User Interface

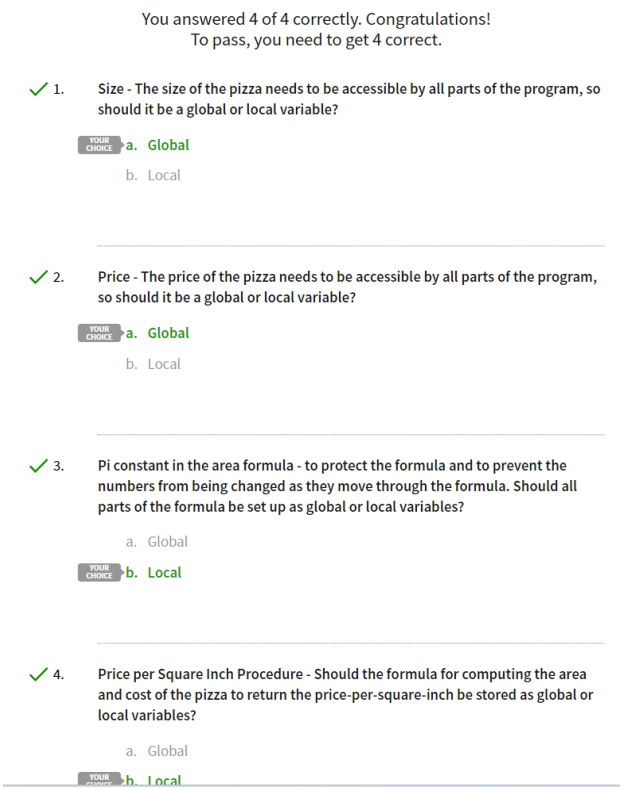
Define “procedural abstraction” in your own words:
Using a procedure without knowing how it works or how to use it.

Abstraction & Abstracted Programming Languages

Read Algorithms & Abstraction. In your own words, what is the difference between Algorithms and Abstraction?
An algorithm is a line of continuous code that is designed to pull out actions while abstraction is used to set things up for the code like prep of some sort.

Variables and Procedures

Submit a screenshot of the assessment on #3 with your results.



You answered 4 of 4 correctly. Congratulations!
To pass, you need to get 4 correct.

✓ 1. Size - The size of the pizza needs to be accessible by all parts of the program, so should it be a global or local variable?

YOUR CHOICE a. Global

b. Local

✓ 2. Price - The price of the pizza needs to be accessible by all parts of the program, so should it be a global or local variable?

YOUR CHOICE a. Global

b. Local

✓ 3. Pi constant in the area formula - to protect the formula and to prevent the numbers from being changed as they move through the formula. Should all parts of the formula be set up as global or local variables?

a. Global

YOUR CHOICE b. Local

✓ 4. Price per Square Inch Procedure - Should the formula for computing the area and cost of the pizza to return the price-per-square-inch be stored as global or local variables?

a. Global

YOUR CHOICE b. Local

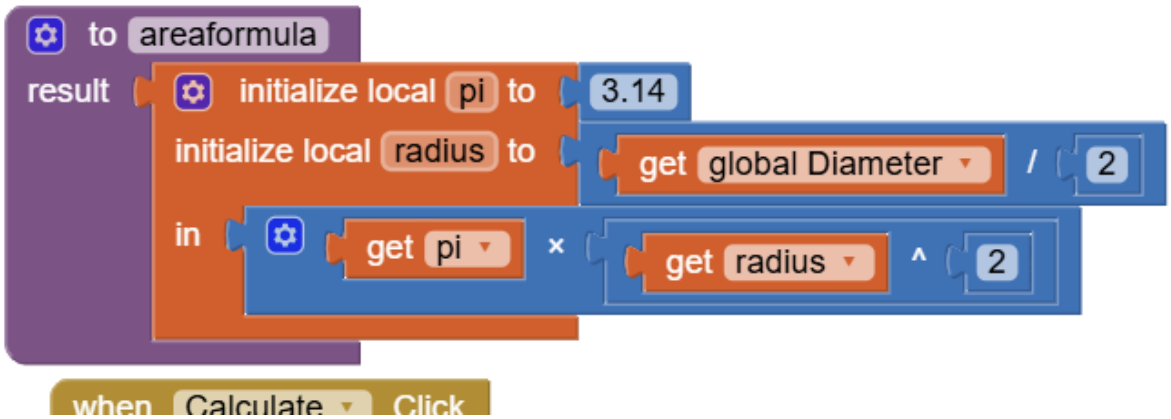
Procedures, Methods, and Functions

What is the difference between a procedure, method and function (in your own words)?

A procedure is a block of code that performs a specific task but doesn't always return a value. A function is similar to a procedure but always returns a value as part of its output. A method is a function or procedure that is associated with an object or class in object-oriented programming, meaning it operates on data belonging to that object or class.

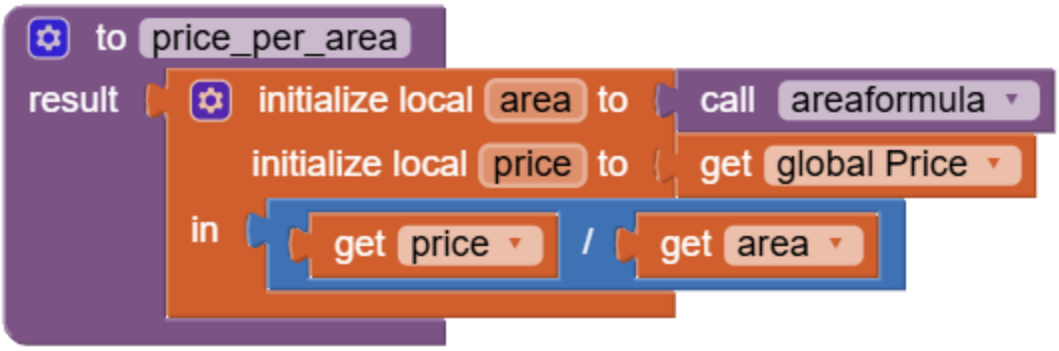
AreaFormula Procedure with Local Variables

Screenshot of your code (MUST use a Procedure):



Setting Up Variables and a Procedure for Price & Calling a Procedure

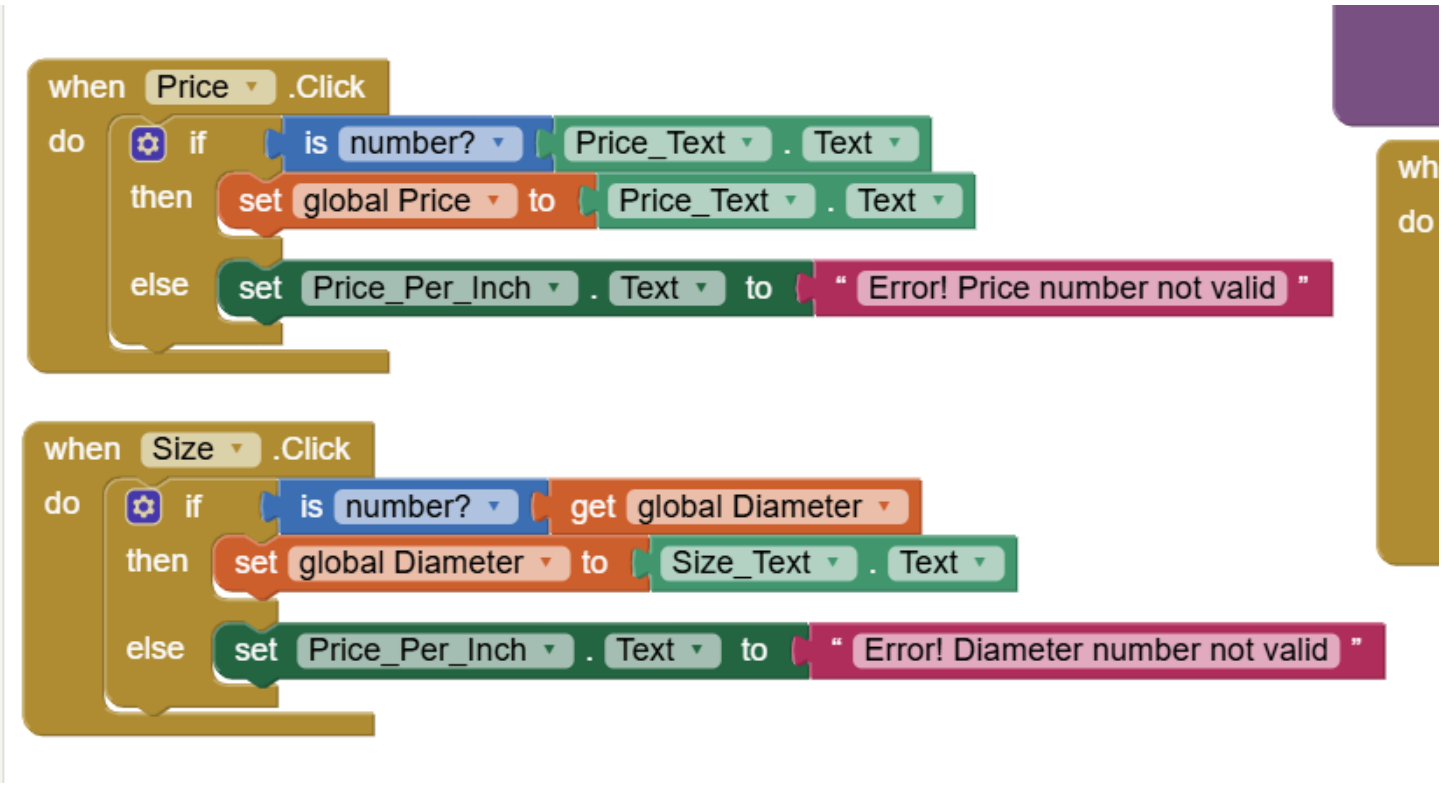
Screenshot of your code:



Conditionals to Prevent a Broken Appearance

Screenshot of your code from #10 (want to see the result of the puzzle!):

Don't forget to save if it works!!!



Creating an Incrementing Counter

Did you have any bugs throughout this part of the code? If so, what were they and how did you fix them? Some of the bugs that came up were figuring out how the amount per slice would be calculated. Not all the code was working out, to solve this issue we had to go over past projects to maybe find a piece of code that could help with this problem.

Adding a Reset Event

Test your code. Do you have any errors to fix here?
My reset button was not working for the first few parts but then I added a few other pieces of coe to help it work a bit better.

How Many Slices Per Pizza?

Test your code. Do you have any errors to fix here?

I didn’t know why my numbers weren't working and each time I got an error telling me it couldn’t find a piece of code, so I decided to call a few global blanks and set them to 0 to make them work.

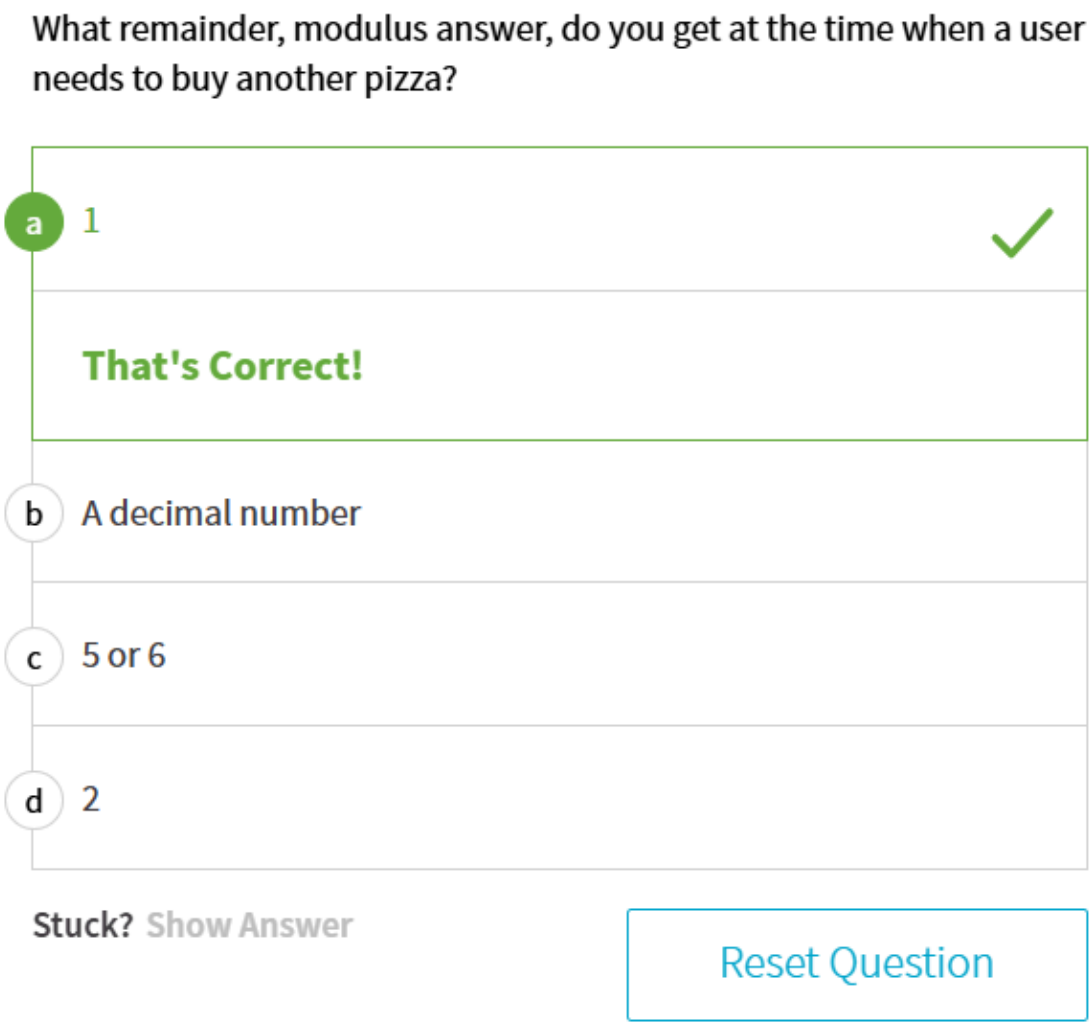
Modulo

What does the modulo operator do?
The modulo operator returns the remainder or signed remainder of a division, after one number is divided by another.
How is modulo used in this code (add a screen capture if it will help your explanation)?

When do you need to order another whole pizza?

Screenshot the answers to the fill in the blank table:

No. of Slices	Operation (divided by)		Output using Division operator (Quotient)	Output using Round operator	Modulus Answer (Remainder)
8	÷	8	1	1	0
9	÷	8	1.125	1	1
10	÷	8	1.25	1	2
11	÷	8	1.375	1	3
12	÷	8	1.5	2	4
13	÷	8	1.625	2	5
14	÷	8	1.75	2	6
15	÷	8	1.875	2	7
16	÷	8	2	2	0
17	÷	8	2.125	2	1



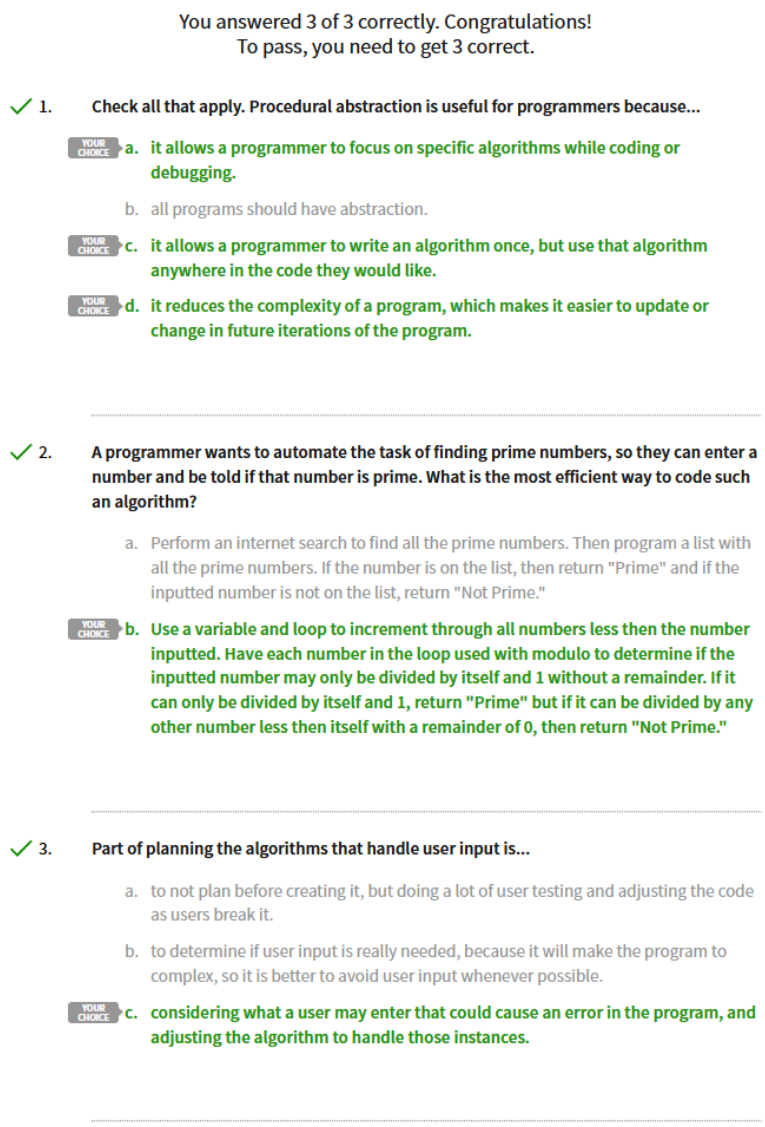
Setting Up a Conditional with Modulo

Screenshot your code through step 34:

Price Per Slice

Once your code is working in its entirety, record a brief video (<1 minute) of you running your code to show it executing properly on the tablet/emulator as well as showing your final code in MIT App Inventor. Please use proper screen recording techniques.

Screenshot of the 1.2.3 Check for Understanding:



You answered 3 of 3 correctly. Congratulations!
To pass, you need to get 3 correct.

✓ 1. **Check all that apply. Procedural abstraction is useful for programmers because...**

YOUR CHOICE **a. it allows a programmer to focus on specific algorithms while coding or debugging.**

b. all programs should have abstraction.

YOUR CHOICE **c. it allows a programmer to write an algorithm once, but use that algorithm anywhere in the code they would like.**

YOUR CHOICE **d. it reduces the complexity of a program, which makes it easier to update or change in future iterations of the program.**

✓ 2. **A programmer wants to automate the task of finding prime numbers, so they can enter a number and be told if that number is prime. What is the most efficient way to code such an algorithm?**

a. Perform an internet search to find all the prime numbers. Then program a list with all the prime numbers. If the number is on the list, then return "Prime" and if the inputted number is not on the list, return "Not Prime."

YOUR CHOICE **b. Use a variable and loop to increment through all numbers less then the number inputted. Have each number in the loop used with modulo to determine if the inputted number may only be divided by itself and 1 without a remainder. If it can only be divided by itself and 1, return "Prime" but if it can be divided by any other number less then itself with a remainder of 0, then return "Not Prime."**

✓ 3. **Part of planning the algorithms that handle user input is...**

a. to not plan before creating it, but doing a lot of user testing and adjusting the code as users break it.

b. to determine if user input is really needed, because it will make the program to complex, so it is better to avoid user input whenever possible.

YOUR CHOICE **c. considering what a user may enter that could cause an error in the program, and adjusting the algorithm to handle those instances.**

Optional: After you answer the conclusion questions, if you have extra time, try out one of the challenges! Insert a brief 15-25 second video showing the successful completion of the challenge if you get there!

CONCLUSION

1. What is modulo doing in YOUR program?

ESSENTIAL QUESTIONS

1. How are arithmetic and logical concepts integrated into algorithms?
2. How does abstraction in the programming language make code easier to understand?
3. How are details being hidden or removed by an abstraction?

2.

1. Arithmetic concepts are used in algorithms to perform mathematical calculations and manipulate numeric data. Logical concepts are used to make decisions, control the flow, and evaluate conditions. These concepts help algorithms process data, solve problems, and automate tasks more efficiently.
2. Abstraction makes code easier to understand by hiding complicated details and showing only what is necessary. For example, using a function allows you to focus on what it does instead of how it works, which keeps the code simpler and easier to work with.
3. Abstraction hides details by grouping complex actions into simpler commands, like functions or classes.

Submit both this completed document and your program file to Canvas (Make Sure your Teachers Have Access to Your Video Files as well!!!!!!!!!!).
