Activity 1.2.3 Procedural Abstraction: Price per Slice

PLTW | Computer Science

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https://github.com/Zynecal/1.2.3-AayushLuka

Create a User Interface

Define “procedural abstraction” in your own words:

Procedural abstraction is when you create or apply procedures in your code while knowing what the procedures do; but not know how they do it.

Abstraction & Abstracted Programming Languages

Read Algorithms & Abstraction. In your own words, what is the difference between Algorithms and Abstraction?

An algorithm is a set of clear instructions or steps to solve a specific problem or do a task. While an abstraction means hiding the details and focusing only on the important parts.

Variables and Procedures

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

✓ 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**

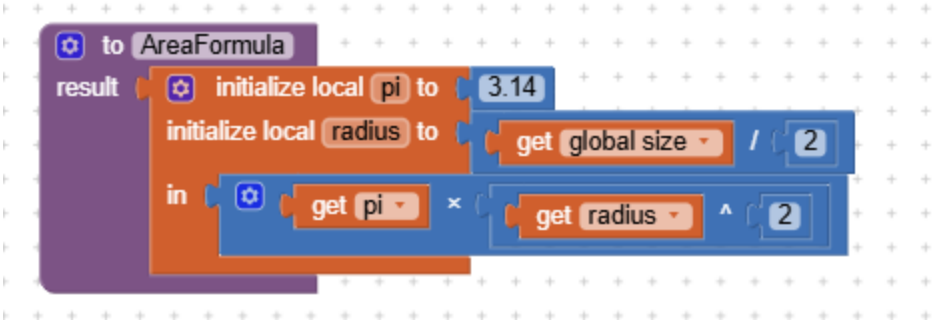
Procedures, Methods, and Functions

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

Function: Something that returns a value, usually dependent on the arguments.
Procedure: Something that returns no value.
Method: Something that is defined within a class and usually operates on an instance of this class or the class itself.

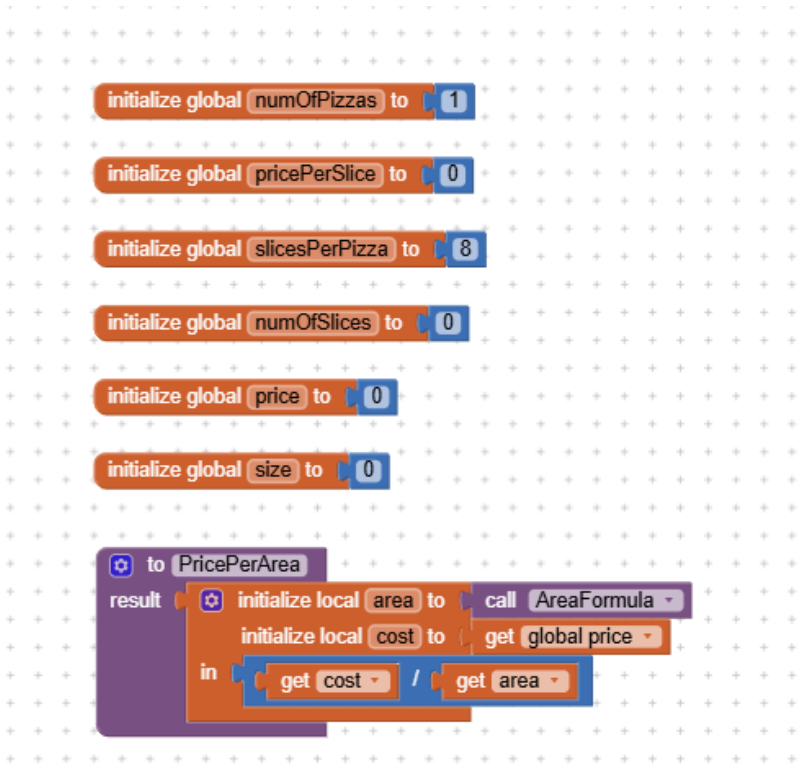
AreaFormula Procedure with Local Variables

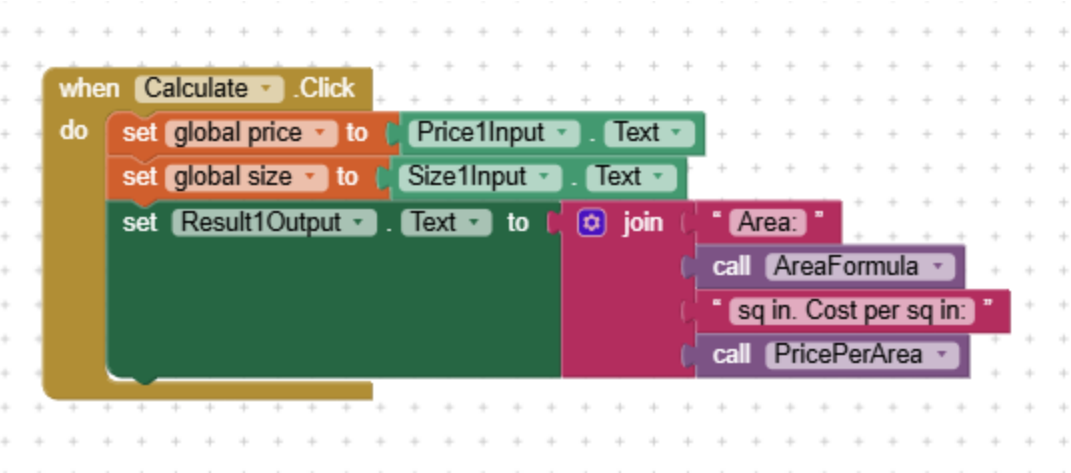
Screenshot of your code (MUST use a Procedure):



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

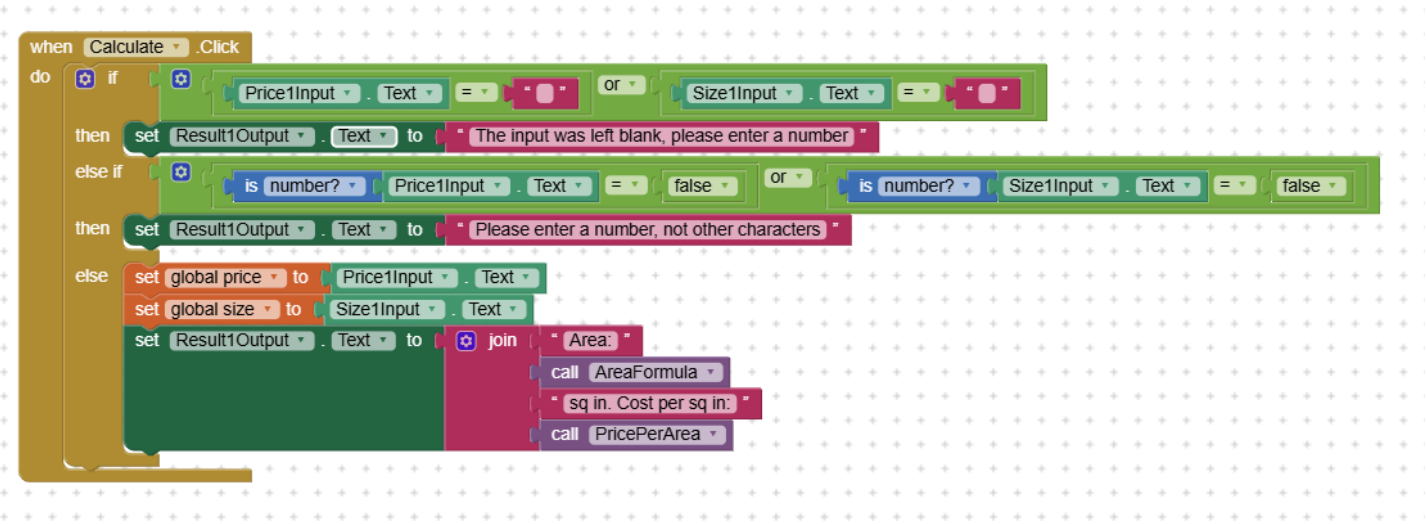
Screenshot of your code:





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?

We were having trouble trying to get our price per square inch to show up/calculate inside of the app. We were able to fix this problem by redoing the code and going back to the book to

make sure we did it correctly, which we didn't at first. We also had a problem before this where when we would press the calculator button it said can't divide 0 by 0.

Adding a Reset Event

Test your code. Do you have any errors to fix here?
No we got it to work

How Many Slices Per Pizza?

Test your code. Do you have any errors to fix here?
We aren't able to get the cost per person per number of slices based on the number of slices per pizza. Later on, our problem is that when we order let's say 20 slices of pizza, it only says we need 2 pizzas and not 3 even though 2x8=16 and that's not enough pizzas for all 20 people.

Modulo

What does the modulo operator do?

The Modulo operation returns the remainder after one number is divided by another. Such as, 9/8 remainder is 1, so it adds another whole pizza

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:

Check below

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.**

Screenshot of #29 Check for Understanding

What remainder, modulus answer, do you get at the time when a user needs to buy another pizza?

a A decimal number

b 5 or 6

c 1 ✓

That's Correct!

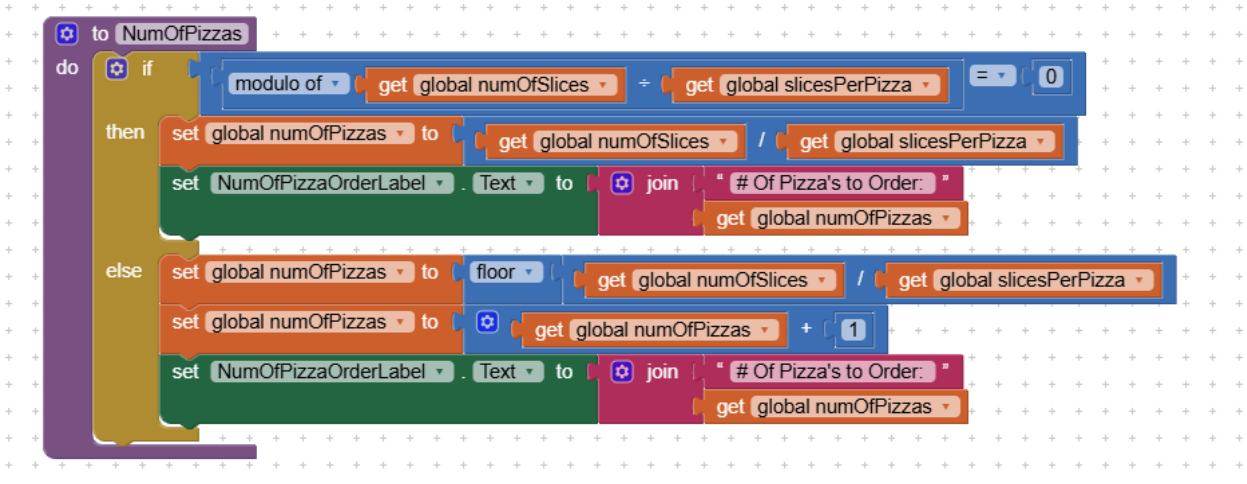
d 2

Stuck? Show Answer

Reset Question

Setting Up a Conditional with Modulo

Screenshot your code through step 34:

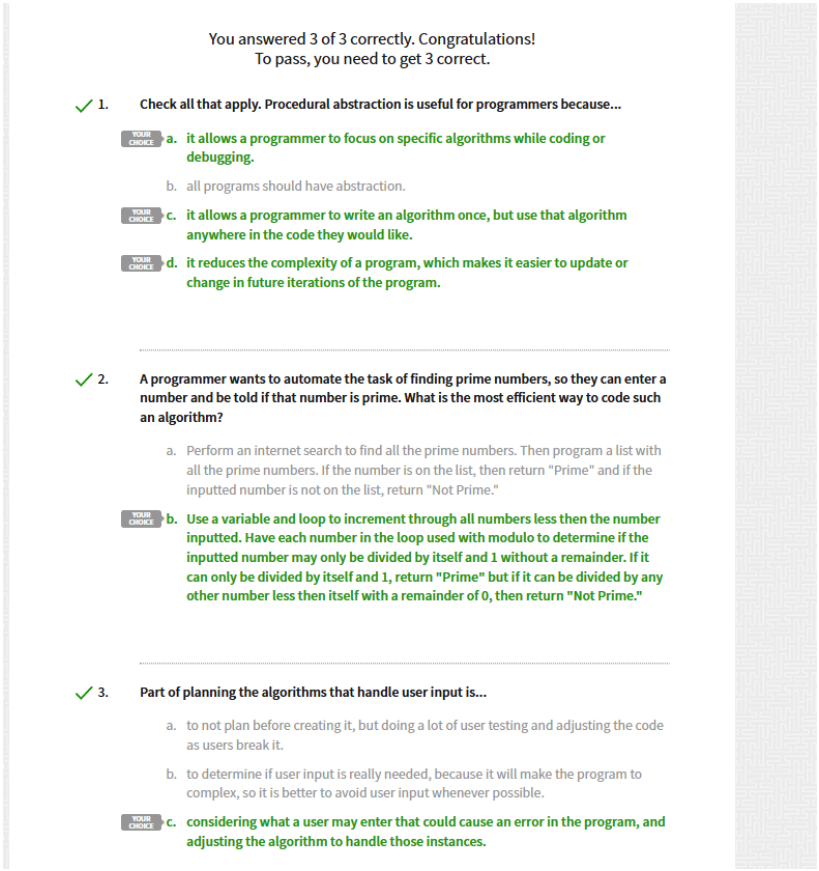


Price Per Slice

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.

https://github.com/Zynecal/1.2.3-AayushLuka/blob/main/ScreenRecording_12-09-2024%2022-45-09_1.mp4

Screenshot of the 1.2.3 Check for Understanding:



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- YOUR CHOICE **c. it allows a programmer to write an algorithm once, but use that algorithm anywhere in the code they would like.**
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- 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 in algorithms are used to perform calculations such as addition, subtraction, and multiplication to process and for data. Logical concepts are for decision making through operations, conditional statements, controlling the flow and structure of the algorithm.

2. Abstraction in programming makes simple code by hiding details and providing a better interface helping developers focus on problems without worrying about non-important implementation specifics.

3. Abstraction removes details by summarizing the functions within the interfaces, helping users to interact with high level constructs while the non important problems are put to the side

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