



What does "coding requires thinking procedurally" mean?

How a Computer Thinks (Procedurally)

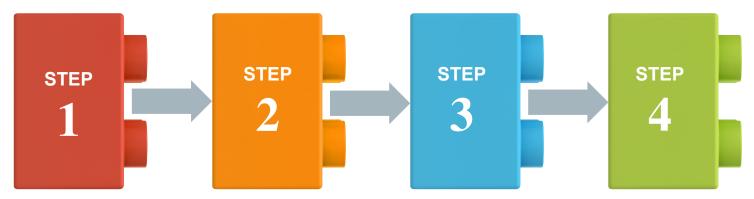
Every software development problem begins with a complex and abstract real-world need.



How a Computer Thinks (Procedurally)

In order for a computer to interpret things, a real-world problem must be broken down into a set of procedural steps.

Complex Real-World Problem



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How Code Is Written (Procedurally)

Code (JavaScript)

```
// STEP 1
                                                          STEP 1
   var thingamagig = 500;
   var doodad = 200;
 5
                                                          STEP 2
   // STEP 2
   var combindedThing = thingamagig + doodad
 9
   // STEP 3
                                                          STEP 3
   runContraption(combindedThing);
13
   // STEP 4
                                                          STEP 4
   resetContraption();
```

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What are the four fundamental tools of programming?

Fundamental Tools of Programming

These structures are found in nearly all programming languages:



Variables: The Nouns of Code

- Variables are effectively the items in a procedure.
- They can be physical things (like an ingredient) or abstractions (like a counter).
- In VBA, items can be **declared** as variables by using **dim** followed by a type. Then they can be **assigned** a value.

Variable Declaration

```
dim ing1 as String
dim ing2 as String
dim budget as Double
```

Variable Assignment

```
ing1 = "Peanut Butter"
ing1 = "Jelly"
budget = 5.00
```

Array: A Collection of Items

Arrays are effectively **groups** of related items. They are another way to store and reference similar pieces of information.

```
Item 0
                       Item 1
                                       Item 2
["Peanut Butter",
                                         "Bread"
                       "Jelly",
dim ingredients(0 to 2) as String
ingredients(0) = "Peanut Butter"
ingredients(1) = "Jelly"
ingredients(2) = "Bread"
```

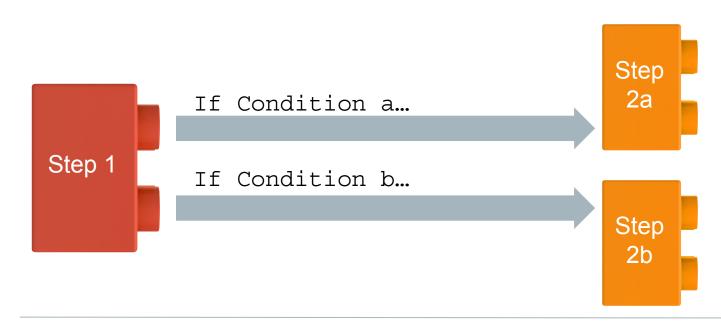
Conditionals: If This, Then That



Conditionals can control the flow of logic based on certain conditions being met.



Most programming languages use if/else code for this purpose.



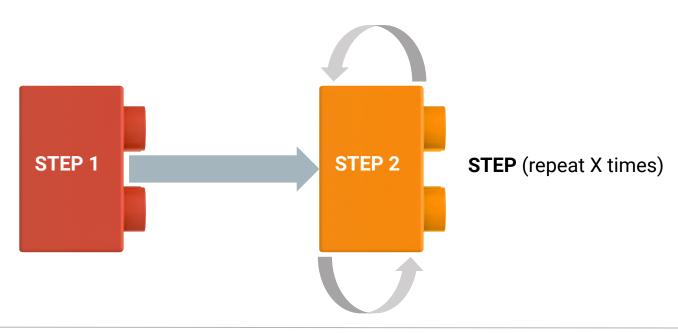
Iteration: Round and Round We Go!



Iteration is the concept of using loops to perform a group of tasks repeatedly a number of times.



Almost all programming languages use **for loops** and **while loops** for iteration.



Functions: When One Block Can't Do It All!

Functions are, in essence, a sort of sub-process. They allow us to create premade, reusable blocks of code that can be called on demand.

