

## In-Class Introductory Topics

What is an *algorithm*?

The notion of an *algorithm* is much older than modern computing. For purposes of computers, an algorithm needs to be:

We will explore other properties of algorithms by example.

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### Example Algorithm

What does this function/method compute?

```
int max(int a, int b, int c) {  
    if (a > b) {  
        if (a > c) return a;  
        else return c;  
    }  
    else {  
        if (b > c) return b;  
        else return c;  
    }  
}
```

The algorithm has three *inputs* (\_\_\_\_\_)

and one *output* (\_\_\_\_\_)

The algorithm is defined *precisely* and is *deterministic*.

Determinism is a key feature:

A *non-deterministic* procedure:

How can we introduce non-determinism in an algorithm?

Important properties:

*finiteness*:

*correctness*:

*generality*:

*efficiency*:

How do we know that our example algorithm terminates?

How can we *verify* correctness?

A variant that is not general:

```
int max(int a, int b, int c) {  
    if (a > 10 && b < 10 && c < 0) return a;  
}
```

Does it give any incorrect answers?

Give a set of inputs for which it does not produce any answer.