Design Patterns

April 4, 2015

Design Patterns
Introduction Lite

Some guys got together and wrote down some *patterns* they've encountered over their careers in software development and slapped some names on them.

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That's it... really.

Design Patterns
Introduction Lite

Definition

Design Patterns are recurring architectural concepts in software
development that have been used to solve specific problems.

Design Patterns
Introduction Lite

1. There are many named *patterns* in the wild.
2. You've already derived and used a couple patterns.

Design Patterns
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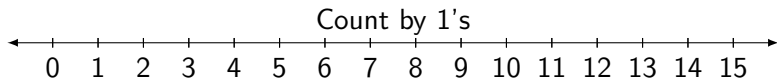You just did not know it was a *thing* that had a name.

Design Patterns
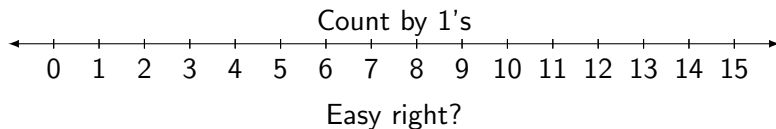
Introduction Lite

And they exist everywhere **else**...

Design Patterns

Learning how to count... again

Count by 1's

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Design Patterns

Learning how to count... again

Count by 1's

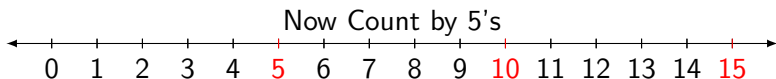0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Easy right?

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Learning how to count... again

What mathematical operation did you use?

Design Patterns

Learning how to count... again

Now Count by 5's

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

Design Patterns
Think like a programmer

1. Create a function that calculates the *nth* multiple of 5.
2. Create a function that calculates the *next* multiple of 5.
3. What do all the multiples of 5 have in common?

Design Patterns
Think like a programmer

Definition
intrinsic property - sharable features that gives rise to an entity's uniqueness.

Design Patterns
Think like a programmer

Definition
intrinsic property - sharable features that gives rise to an entity's uniqueness.

Definition
extrinsic property - features/behavior created by a context of usage and therefore can not be shared.

Design Patterns
Think like a programmer

1. Provide an **intrinsic property** of an object that represents only the numbers 5, 15 and 25.

Design Patterns
Think like a programmer

1. Provide an **intrinsic property** of an object that represents only the numbers 5, 15 and 25.
2. Provide an **extrinsic property** of an object that represents only the numbers 5, 15, and 25.

Design Patterns

Think like a programmer

Task: Create a **NumberLine** class that represents all multiples of 5 on the interval $(0, \infty)$

Design Patterns
Flyweight

A **flyweight** is a pattern where you can use a single shared object to represent many *items*.

Huh?!

Design Patterns

Flyweight

<div style="text-align:center">~~Kanye's~~ Conway's Game of Life</div>

1. why couldn't we create an object for each cell in a *large* grid?
2. what was the **intrinsic property** of a cell?
3. what was the **extrinsic property** of a cell?

> **Task**: Create an object or object instance that represents all live cells in a ∞-by-∞ sized grid.

Ta-dah!