

# Functional Programming: The Big Picture

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WHAT IS FUNCTIONAL PROGRAMMING?



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# A Quick Roadmap

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# Common Questions



How is this different than what I already do?



Can I use functional programming in line of business applications?



Why should I learn functional programming?





Excited to dive deeper in to functional programming



# The Way Forward



Do one thing  
well



Reducing bugs  
with immutable  
data



Why functional  
programming  
matters



Where to go



# Defining Functional Programming

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# Functional Programming

A programming paradigm that treats computation as the evaluation of mathematical functions and avoids changing-state and mutable data.



# Functional Programming

A **programming paradigm** that treats computation as the evaluation of mathematical functions and avoids changing-state and mutable data.





# Other Paradigms

Object-oriented



Procedural



Declarative





Same category as other paradigms

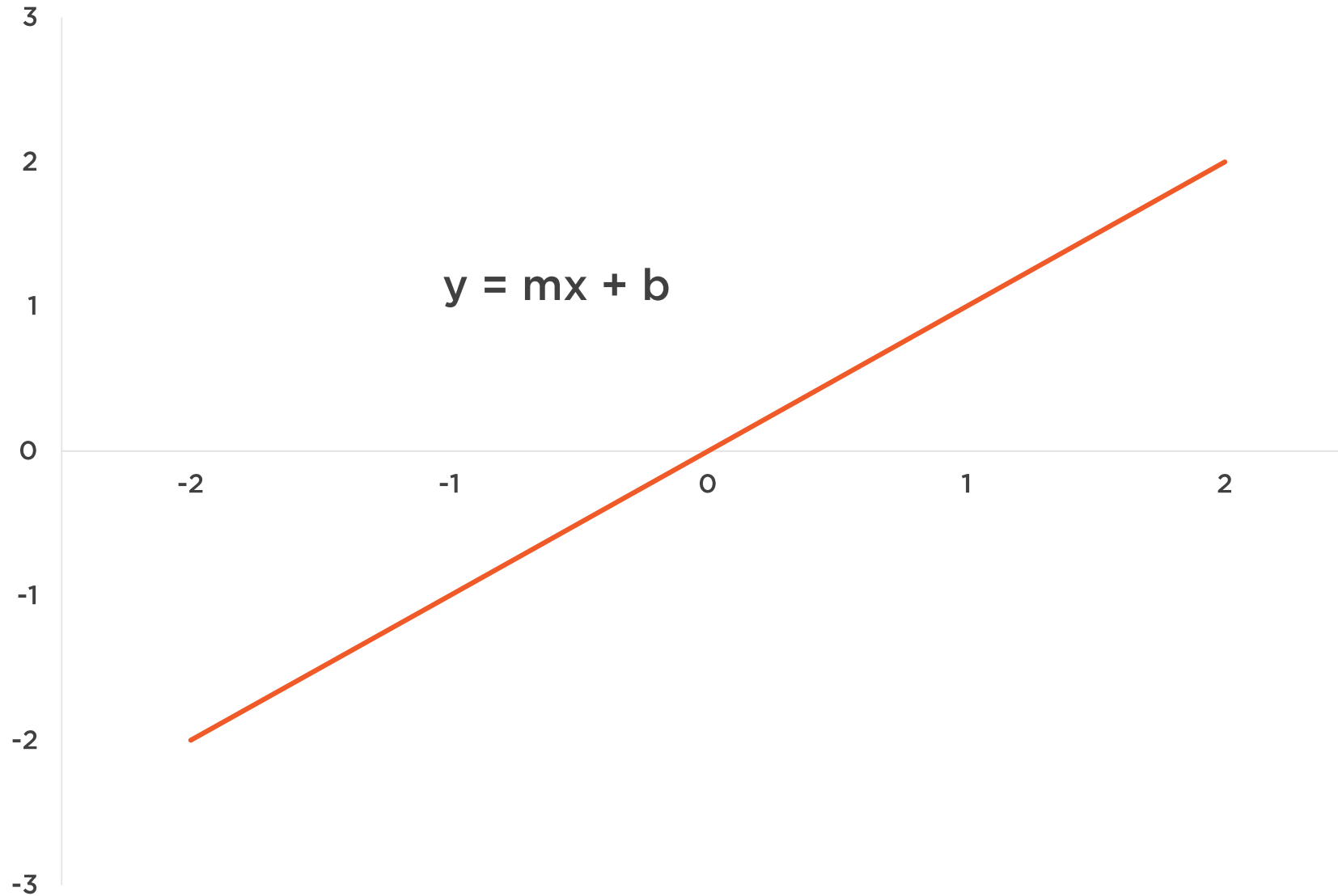


# Functional Programming

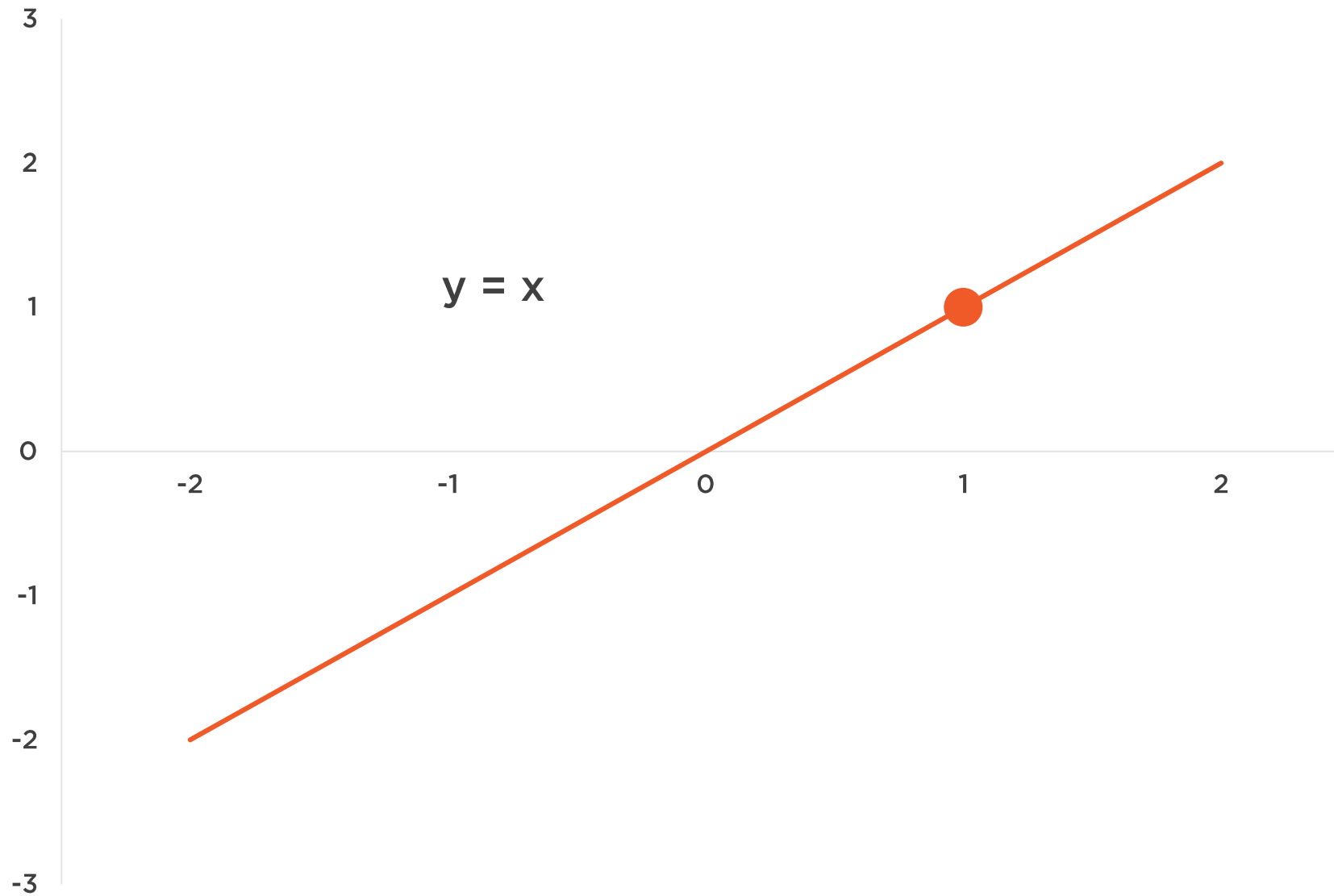
A programming paradigm that treats computation as the evaluation of **mathematical functions** and avoids changing-state and mutable data.



# Mathematical Function



# Mathematical Function



# Pure Function

Does not cause side effects, and will always return the same result for a given input.



```
Math.random(); //0.03
```

```
Math.random(); //0.71
```

## Impure Functions



```
Math.sqrt(81); //9
```

```
Math.sqrt(81); //9
```

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## Pure Functions





# Functional Programming

A programming paradigm that treats computation as the evaluation of mathematical functions and **avoids changing-state and mutable data.**



# Shopping Cart

```
shoppingCart.AddBook('You Are What You Love');  
shoppingCart.GetTotal(); // $12.29
```



# Shopping Cart

```
public float GetTotal()  
{  
    return Items.sum(i => i.price);  
}
```



# Functional Shopping Cart

```
updatedCart = add(shoppingCart, 'You Are What You Love');  
price = getTotal(updatedCart);
```



Functional programming is  
a different approach to  
writing software



# What's Coming Up



Do one thing well



Reducing bugs with immutable data



Why functional programming matters



# Contrasting with Object-oriented Programming

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“I fear not the man who has practiced 10,000 kicks once, but I fear the man who has practiced one kick 10,000 times.”



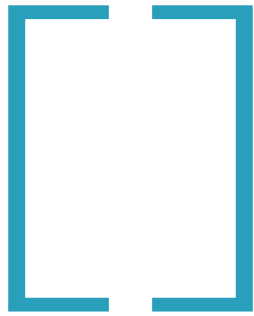


“It is better to have 100 functions operate on one data structure than 10 functions on 10 data structures.”

**Alan Perlis**

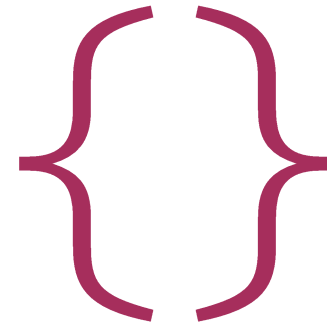


# Functional Programming Data Structures



## List

Collection of data, similar to an array



## Map

Collection of key-value pairs, similar to an anonymous object



# OOP vs. FP

## Object-oriented

More data structures

Fewer functions per data structure

10 functions on 10 data structures

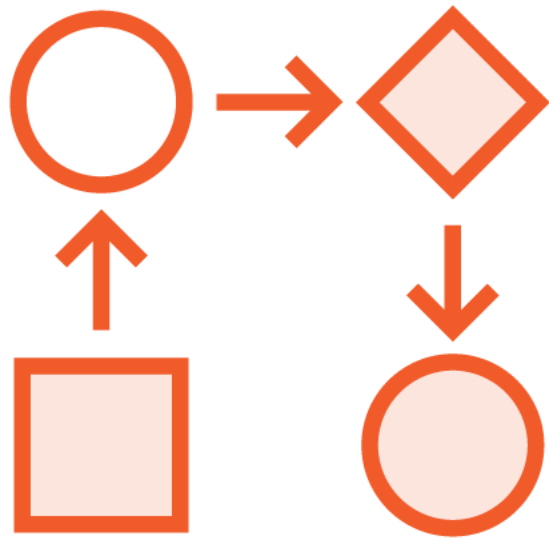
## Functional Programming

Fewer data structures

More functions per data structure

100 functions on 1 data structure





The major difference is how data is processed



This can be overwhelming



# Dealing with the Tension



Brain growth



Keep moving forward



# Up Next



Do one thing well

