

# Common Issues in OOP

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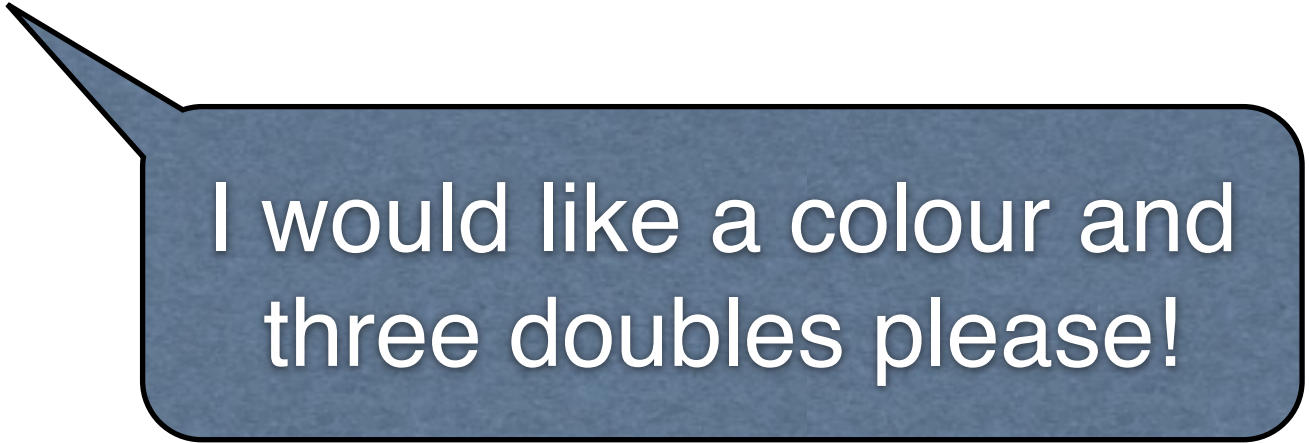
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TECHNOLOGY

We call methods a lot in  
object-oriented programming

# Parameters define the **expectations** of a method

```
public static void DrawCircle(Color clr, double x, double y, double radius)
```



I would like a colour and  
three doubles please!

# When we call a method we need to **fulfil** those expectations

```
SplashKit.DrawCircle(Color.Black, X, Y, 10);
```

Please draw a circle for me, here  
is a colour and three doubles

```
public static void DrawCircle(Color clr, double x, double y, double radius)
```

Ok got it!

# When we call a method we need to fulfil those expectations

```
SplashKit.DrawCircle(Color.Black, true, Y, Radius + 1);
```

Please draw a circle for me, here is a colour, a boolean, and two doubles



**readonly struct** System.Boolean

Represents a Boolean (**true** or **false**) value.

Argument 2: cannot convert from 'bool' to 'double'

[Show potential fixes](#)

```
public static void DrawCircle(Color clr, double x, double y, double radius)
```

I have no idea how to do that...

# The method already knows what kind of data it is expecting

```
SplashKit.DrawCircle(Color.Black, X, Y, 10);
```

```
SplashKit.DrawCircle(Color Color.Black, double X, double Y, double 10);
```


# The method already knows what kind of data it is expecting

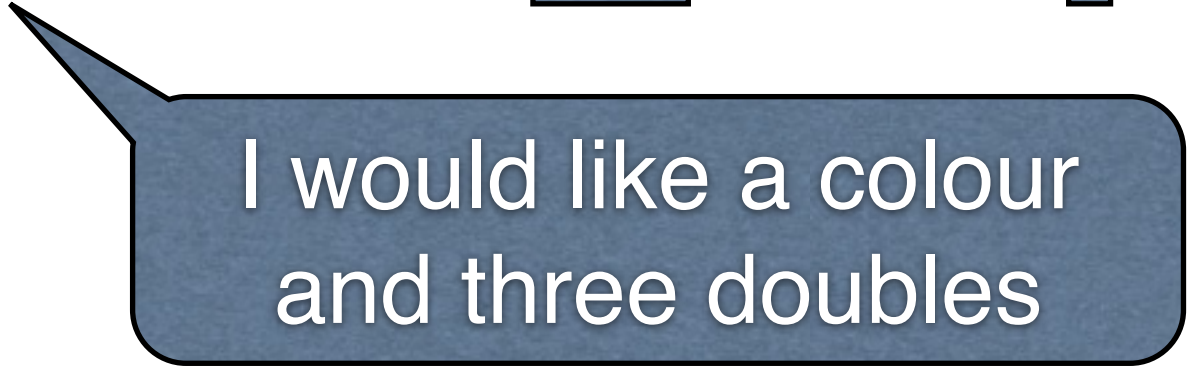
```
SplashKit.DrawCircle(Color.Black, X, Y, 10);
```

```
SplashKit.DrawCircle(Color Color, ck, double X, double Y, double 10);
```



# The names of the parameters don't matter!

```
public static void DrawCircle(Color , double , double , double )
```



I would like a colour  
and three doubles



We can **overload** methods  
with different expectations

# Methods can have the same name as long as they have different parameters

```
public static void DrawRectangle(Color clr, Rectangle rect) ...  
public static void DrawRectangle(Color clr, Rectangle rect, DrawingOptions opts) ...  
public static void DrawRectangle(Color clr, double x, double y, double width, double height) ...  
public static void DrawRectangle(Color clr, double x, double y, double width, double height, DrawingOptions opts)
```

^ 1 of 4 v void SplashKit.DrawRectangle(Color clr, Rectangle rect)

SplashKit.DrawRectangle()

# Often overloaded methods will call each other

```
public Shape(Color shapeColor)
{
    ShapeColor = shapeColor;
    X = 0;
    Y = 0;
    Selected = false;
}

public Shape() : this(Color.Yellow) { }
```

Only overload when you  
**need to**

It's important to understand  
the **scope** of a variable

# Scope tells us where a variable can be accessed

I know about a variable called 'i'!

```
public void MethodOne()  
{  
    int i;  
  
    for (i = 0; i < 10; i++)  
    {  
        // do something  
    }  
}
```

```
public void MethodTwo()  
{  
    // do something  
}
```

What is an 'i'?

# Scope tells us where a variable can be accessed

I know about a variable called 'i'!

```
public void MethodOne()  
{  
    int i;  
  
    for (i = 0; i < 10; i++)  
    {  
        // do something  
    }  
}
```

I know about a different 'i'! Neat!

```
public void MethodTwo()  
{  
    int i;  
  
    for (i = 0; i < 10; i++)  
    {  
        // do something  
    }  
}
```

# Scope tells us **where** a variable can be accessed

```
public void MethodOne()  
{  
    int i;  
  
    for (i = 0; i < 10; i++)  
    {  
        // do something  
    }  
  
    int i;  
}
```



# Scope tells us **where** a variable can be accessed

```
public void MethodOne()  
{  
    int i;  
  
    for (i = 0; i < 10; i++)  
    {  
        // do something  
    }  
}
```



Already exists!

```
int i;
```

# Scope tells us **where** a variable can be accessed

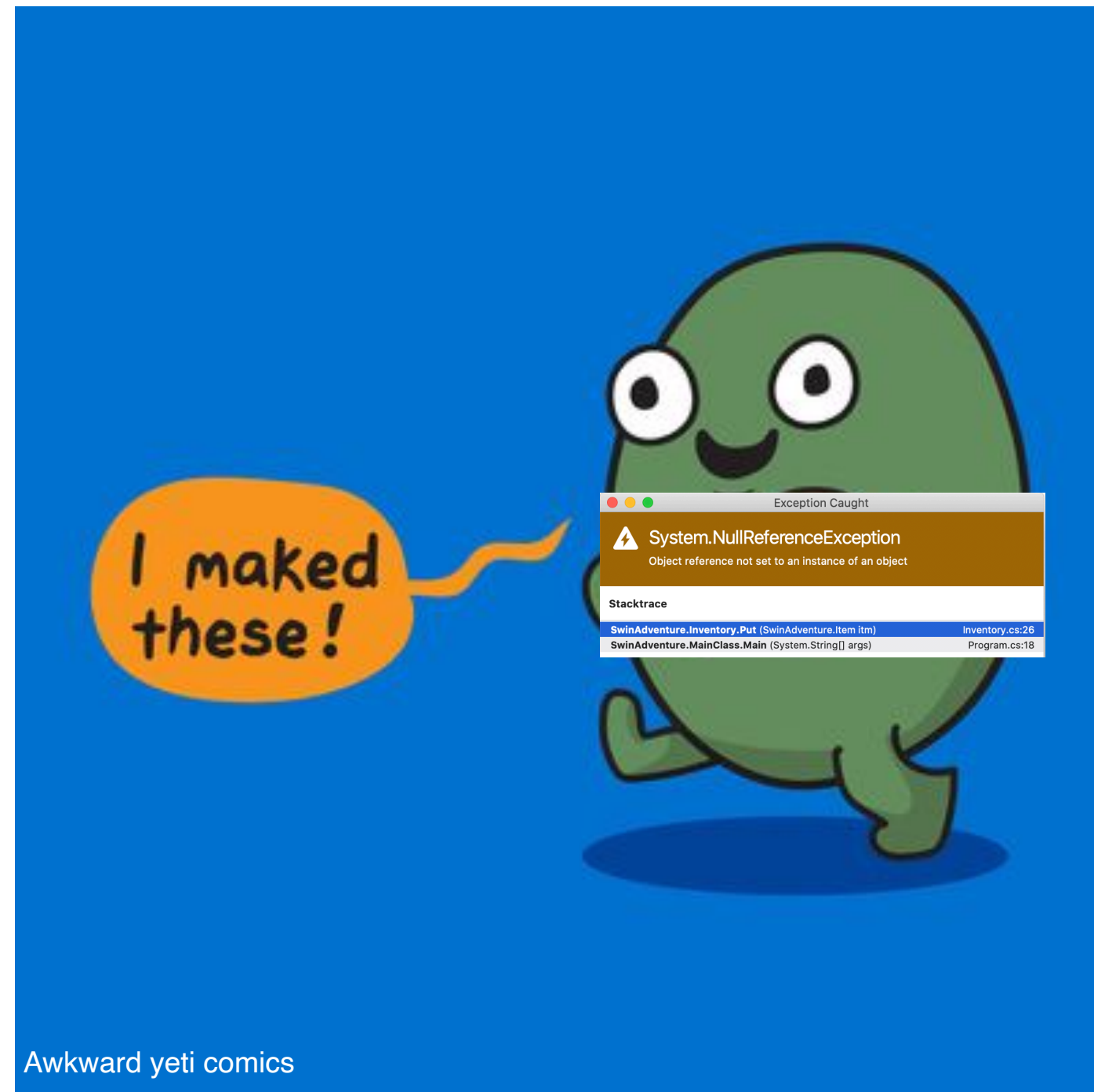
```
public void MethodOne(int X)  
{  
    // do something  
}
```

```
public void MethodTwo(int X)  
{  
    // do something  
}
```

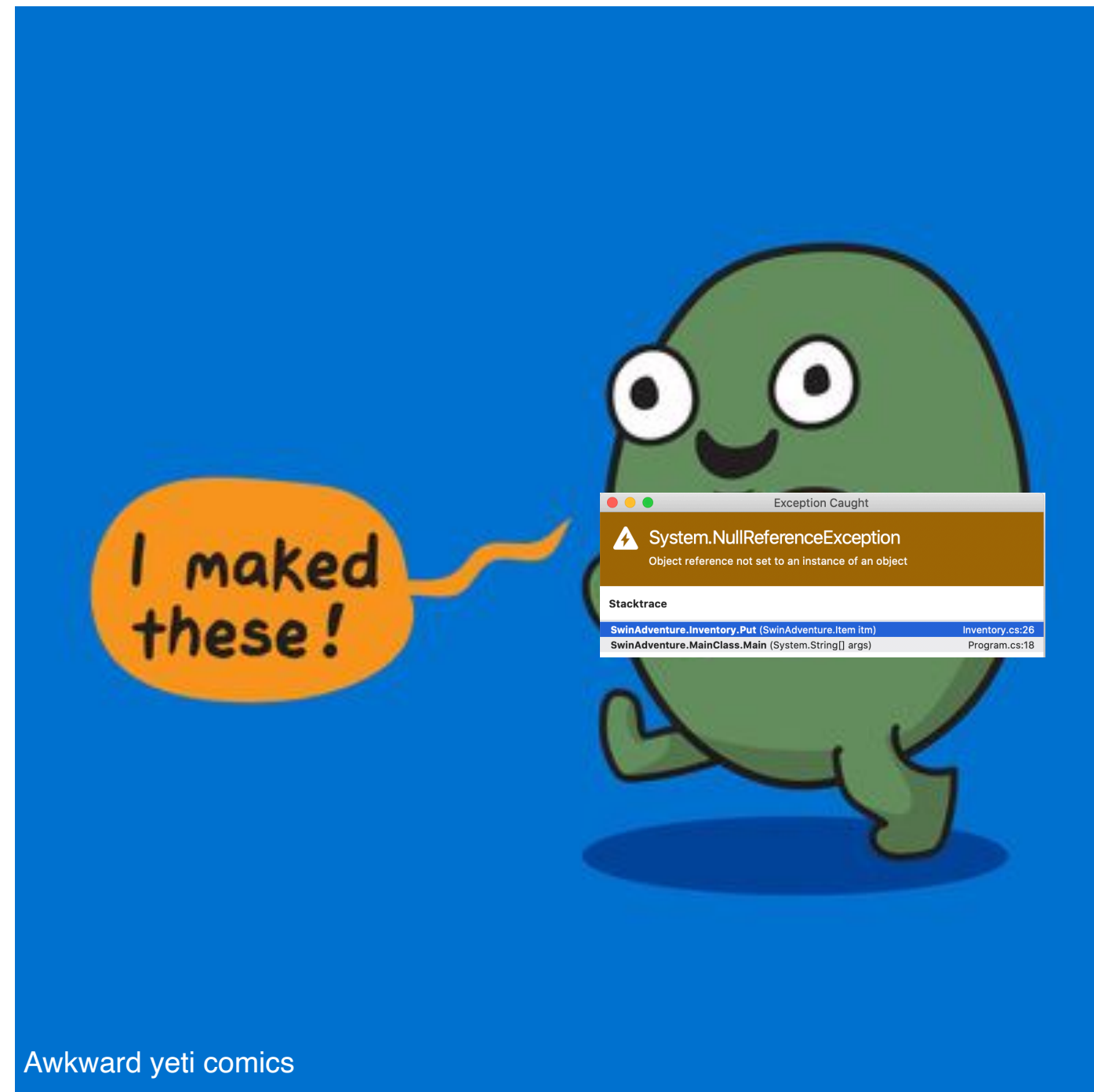
Scope can be for a **method**,  
a **class**, or a **namespace**

Let's talk about error  
messages...

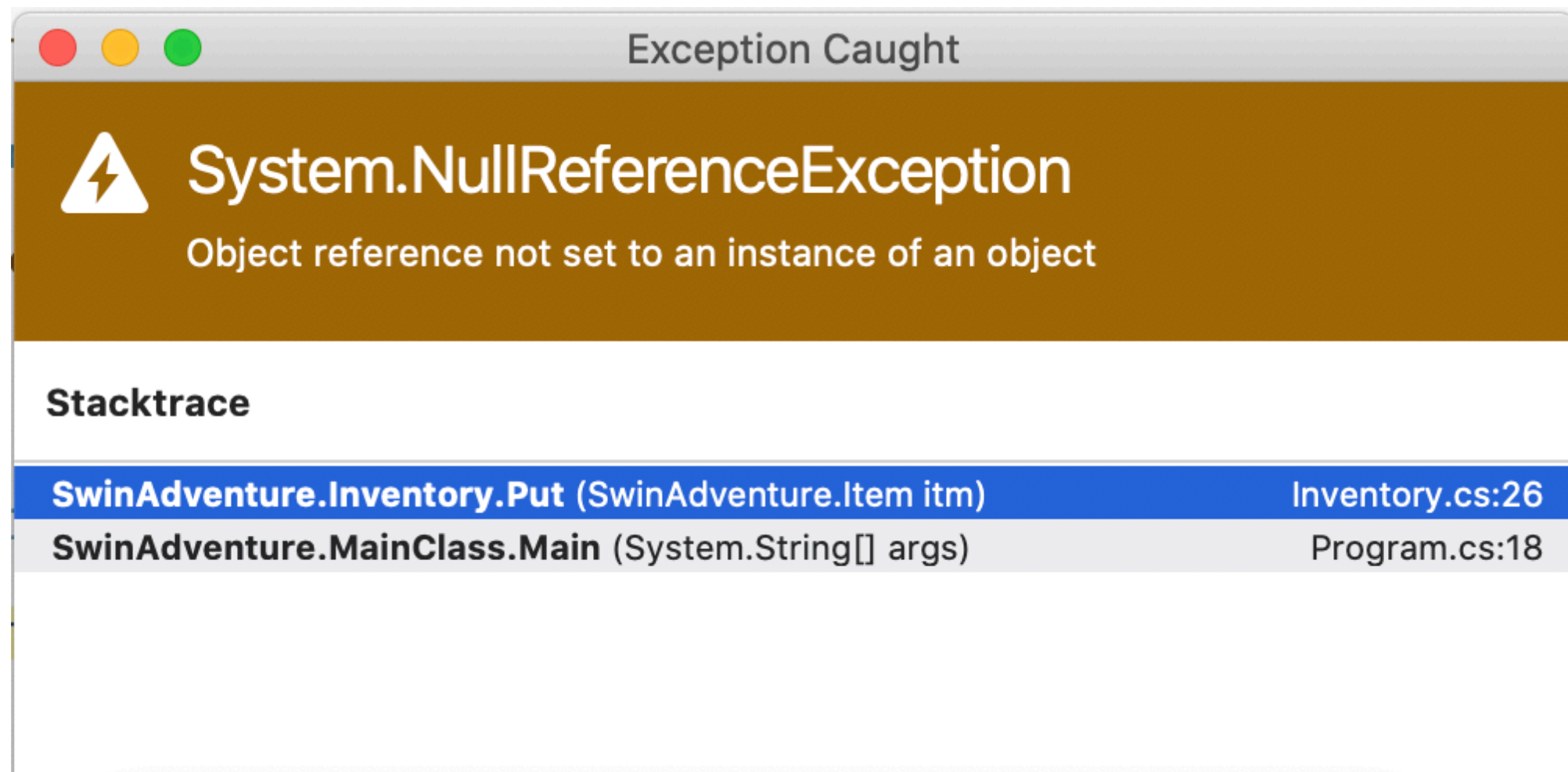
# The computer is *trying* to help you...



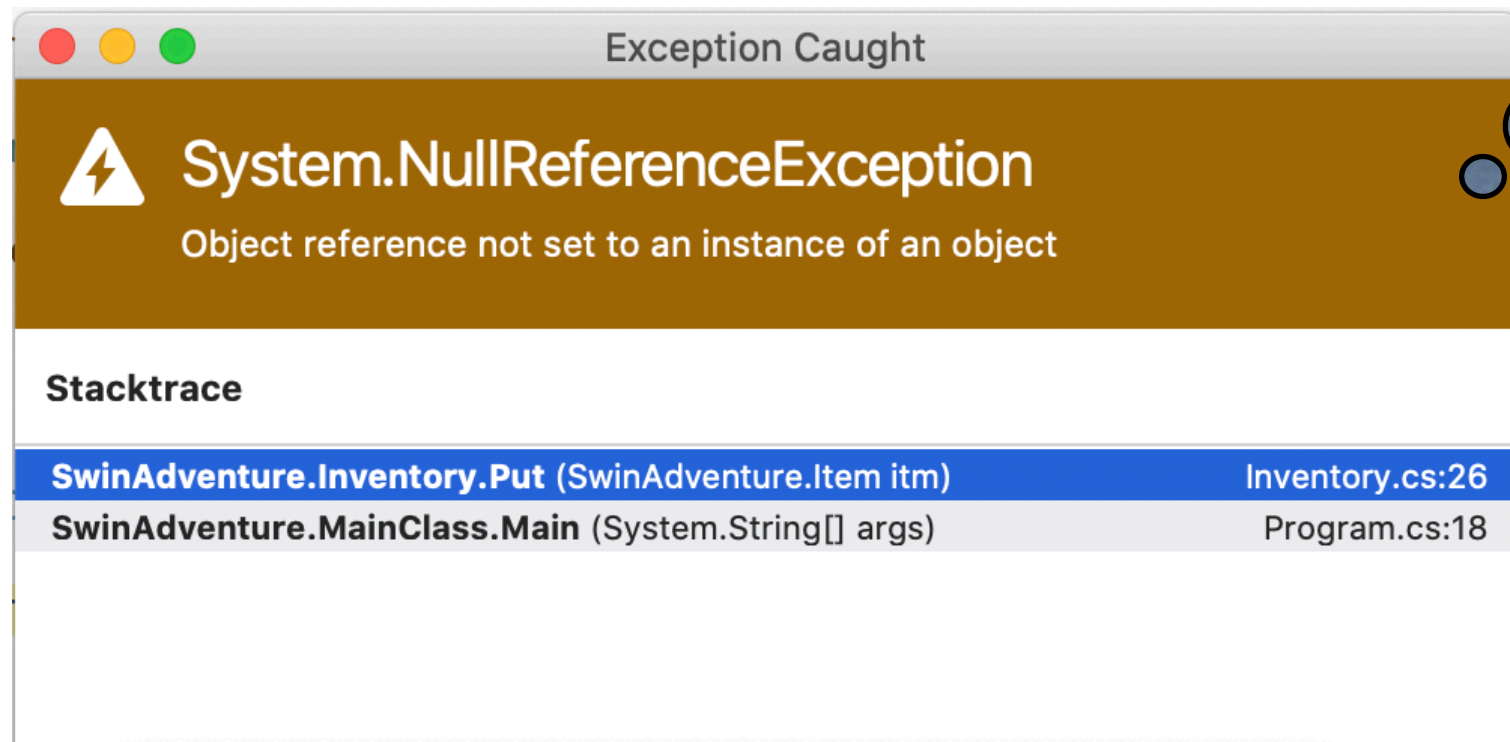
# ...but we need to learn how to listen



# The computer will tell you where it **thinks** the error is happening



# ...but it's not always right

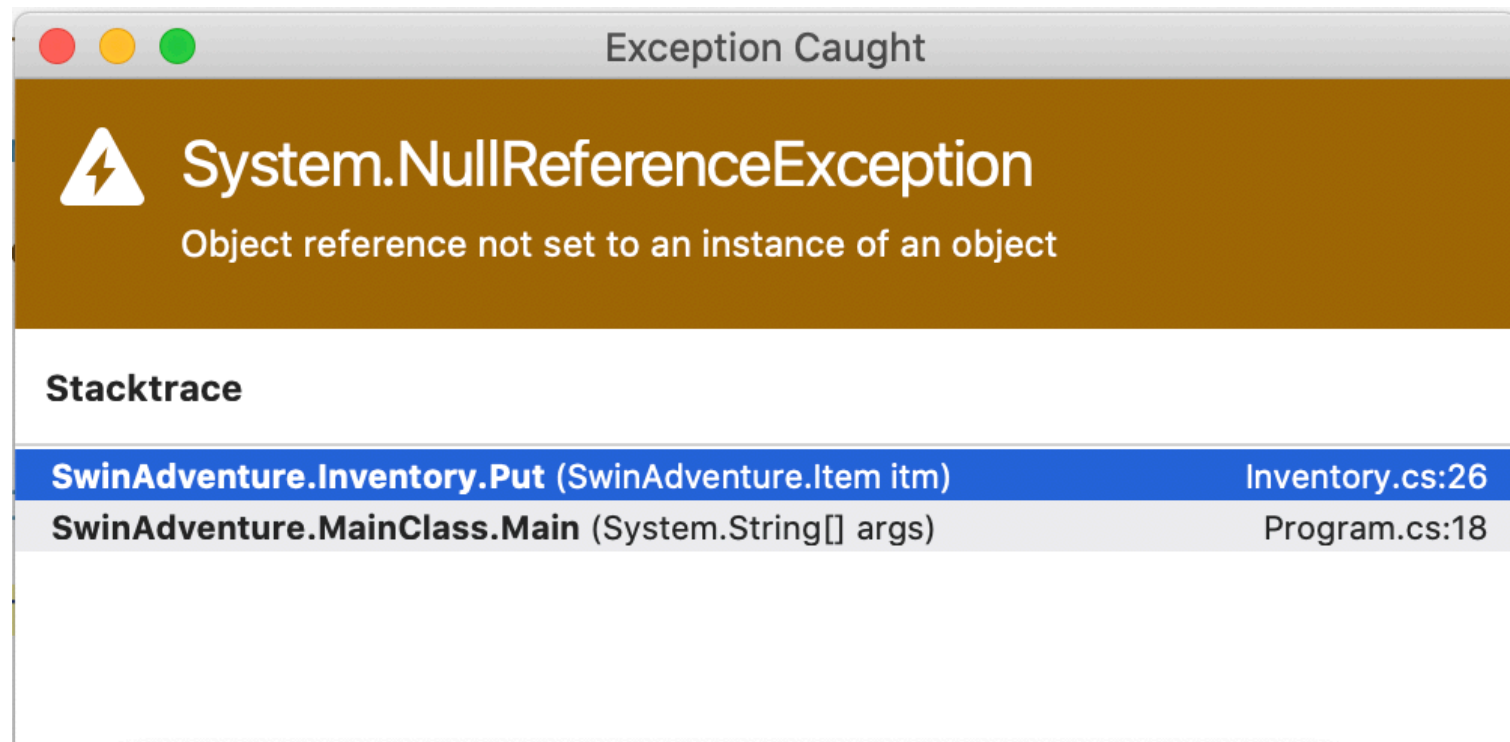


I think the problem is here...

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```



# ...but it's not always right



```
6      public class Inventory
7      {
8          private List<Item> _items;
9
10         public Inventory()
11         {
12         }
13     }
```

**It takes practice!**  
(and some debugging)

Documentation is your friend

# Every good API will have documentation

## Functions

### Draw Circle

Overloaded

This function is overloaded. The following versions exist.

**Draw Circle** ( *clr*: Color *c*: Circle )

**Draw Circle** ( *clr*: Color *c*: Circle *opts*: Drawing Options )

**Draw Circle** ( *clr*: Color *x*: Double *y*: Double *radius*: Double )

**Draw Circle** ( *clr*: Color *x*: Double *y*: Double *radius*: Double *opts*: Drawing Options )

# Every good API will have documentation

## Draw Circle

Draw a circle onto the current window. The circle is centred on its x, y coordinates, and has the provided radius.

### Parameters

Name	Type	Description
Clr	Color	The color of the circle
X	Double	The x location of the circle
Y	Double	The y location of the circle
Radius	Double	The radius of the circle

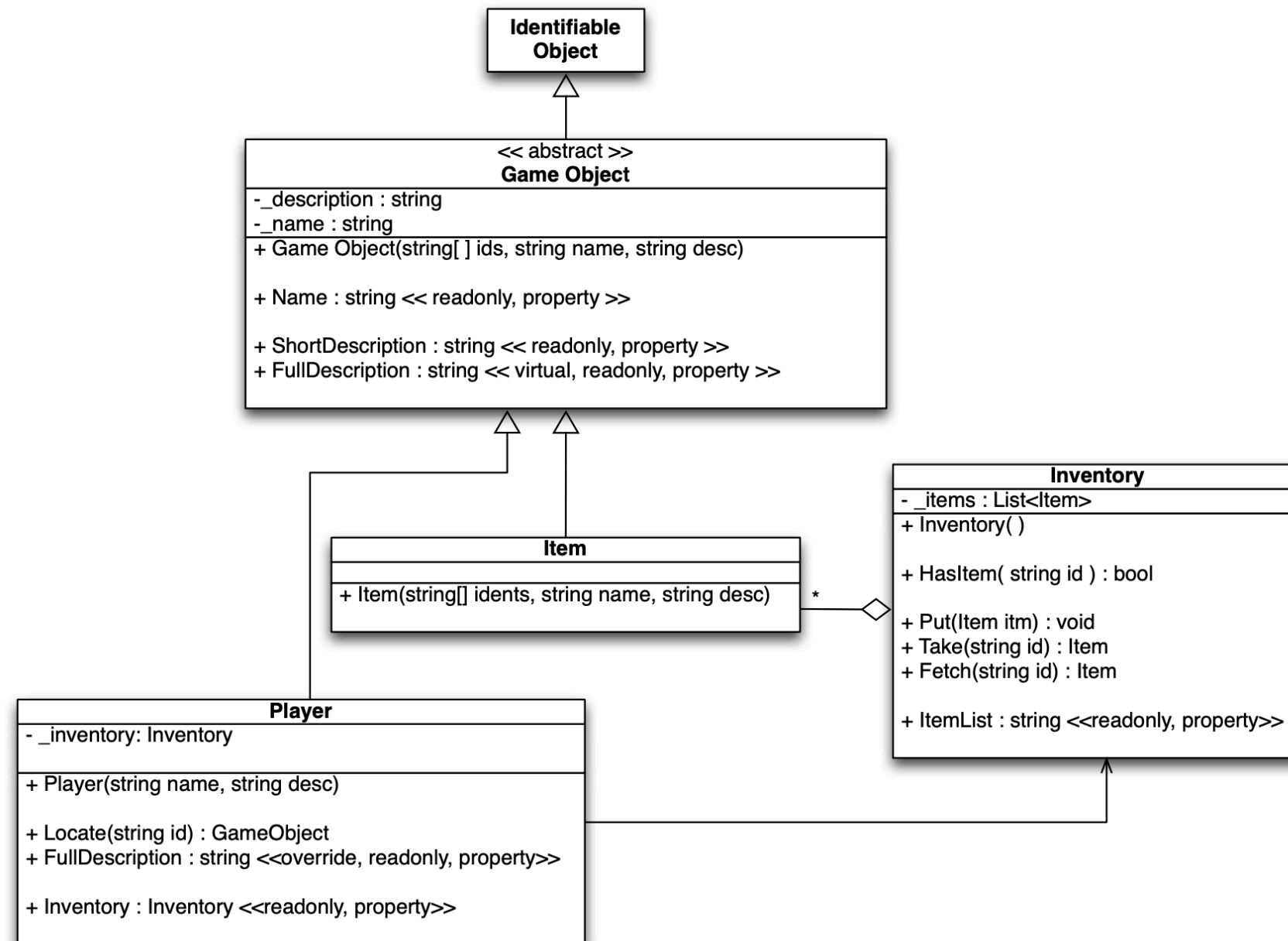
### Signatures

C++ C# Pascal Python

```
public static void SplashKit.DrawCircle(Color clr, double x, double y, double rad
```

Explore API documentation  
to find out what you can do!

# When we give you a design, we have our reasons...



One last thing...



Google!

"Any developer who doesn't have a full tab bar of Google and Stack Overflow tabs isn't working"

"I google basic stuff all the time

Like, "\*\*\*\*, what does String.format do again?"  
\*googles "java string" and goes to the java docs\*

# Google!

"There are millions of developers out there, and it's very likely at least one of them has come across your problem before. Googling your issue will give you links to those discussions and solutions."