A quick Review of Data Types
A quick Review of Data Types

Variables hold data

Numbers for example

Or Strings
A quick Review of Data Types

There are many forms of data
A quick Review of Data Types

There are many forms of data

Images

Sound Files

Videos

etc.
How are those stored?
How are those stored?

Numbers
Not terribly hard

Everything Else
A bit more complex
How are those stored?

Numbers
Not terribly hard

Everything Else
A bit more complex

We know how that works!
How are those stored?

Numbers
Not terribly hard

Everything Else
A bit more complex
What about images?
What about images?
What a nice blue pixel!
What a nice blueish pixel!
What a nice grey pixel!
What a nice _____ pixel !
What a nice _____ pixel!

<table>
<thead>
<tr>
<th>7050W Blue Chill</th>
<th>7060W Cool Vista</th>
<th>7070W Bridgewater</th>
<th>7080W Sistine Blue</th>
<th>7090W Blue Cool</th>
</tr>
</thead>
<tbody>
<tr>
<td>7051W Blue Bouquet</td>
<td>7061W Soft Sky</td>
<td>7071W Meltwater</td>
<td>7081W Clear Day</td>
<td>7091W Ondine Blue</td>
</tr>
<tr>
<td>7052W Brisk Blue</td>
<td>7062W Carolina Blue</td>
<td>7072W Heron Blue</td>
<td>7082W Sky Delight</td>
<td>7092W Inspiration Blue</td>
</tr>
<tr>
<td>7053M Jonathan</td>
<td>7063M Blue Palace</td>
<td>7073M Bluejay</td>
<td>7083M Blue Yonder</td>
<td>7093M Baby Blue Eyes</td>
</tr>
<tr>
<td>7054M Venetian Blue</td>
<td>7064M Water Jet</td>
<td>7074M Brandon's Blue</td>
<td>7084M Parade Blue</td>
<td>7094M Blue Stencil</td>
</tr>
<tr>
<td>7055D Pompeii</td>
<td>7065D Triumph Blue</td>
<td>7075D Electron Blue</td>
<td>7085D Atlas Blue</td>
<td>7095D Grandma Blue</td>
</tr>
<tr>
<td>7056N Endless Blue</td>
<td>7066N Stars Forever</td>
<td>7076A Neon Blue</td>
<td>7086A Gulf Coast</td>
<td>7096A Deep Marine</td>
</tr>
</tbody>
</table>
What a nice Brisk Blue pixel?
Pretty Colors!
Pretty Colors!
Pretty Colors!
Pretty Colors!
Pretty Colors!
Pretty Colors!
Pretty Colors!
What a nice pixel!
What a nice pixel!
What a nice pixel!
What a nice pixel!
Iterating over an image

for(x=0;x<theUnion.width;x++){
}

for(x=0;x<theUnion.width;x++){  
  // Something to do to each pixel
}
Iterating over an image

```java
for(y=0;y<theUnion.height;y++){
    for(x=0;x<theUnion.width;x++){
        // Something to do to each pixel
    }
}
```
Iterating over an image

```java
for(y=0;y<theUnion.height;y++){
    for(x=0;x<theUnion.width;x++){
        thisPixel = theUnion.getRGB(x,y);
    }
}
```
What data type is `thisPixel`?
What data type is `thisPixel`? It's an "Object".

```java
thisPixel = theUnion.getRGB(x,y);
```
What data type is `thisPixel`?

It's an "Object".
Objects have "Properties"
Objects have "Properties"
Properties are like variables

thisPixel
Objects have "Properties"
Properties are like variables

thisPixel.r
Objects have "Properties"
Properties are like variables

thisPixel.r

That is a "dot operator"
Objects have "Properties"
Properties are like variables

thisPixel.r
thisPixel.g
Objects have "Properties"
Properties are like variables

thisPixel.r
thisPixel.g
thisPixel.b
Objects have "Properties"
Properties are like variables

```javascript
alert(thisPixel.r);
thisPixel.g
thisPixel.b
```
Objects have "Properties"
Properties are like variables

`alert(thisPixel.r);`
`thisPixel.g=255;`
`thisPixel.b=0;`
Objects have "Properties"
Properties are like variables

Only the object knows its properties. You must use a dot operator to access them!
for(y=0;y<theUnion.height;y++){
    for(x=0;x<theUnion.width;x++){
        thisPixel = theUnion.getRGB(x,y);
    }
}
}
Objects also have "methods"!

for(y=0;y<theUnion.height;y++){
  for(x=0;x<theUnion.width;x++){
    thisPixel = theUnion.getRGB(x,y);
  }
}
}
Objects also have "methods"!

```java
for(y=0;y<theUnion.height;y++){
  for(x=0;x<theUnion.width;x++){
    thisPixel = theUnion.getRGB(x,y);
  }
}
```

This is a method of the object
Puzzle Time!
Puzzle Time!
If you take this image
Puzzle Time!
If you take this image and apply this code

```java
for(y=0;y<theUnion.height;y++){
    for(x=0;x<theUnion.width;x++){
        thisPixel = theUnion.getRGB(x,y);
        thisPixel.r=0;
        thisPixel.g=0;
        thisPixel.b=0;
        theUnion.setRGB(x,y,thisPixel);
    }
}
```
Puzzle Time!
If you take this image and apply this code

```java
for(y=0;y<theUnion.height;y++){
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}
```

What will you get?
Puzzle Time!
If you take this image and apply this code

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What will you get?
Puzzle Time!

If you take this image and apply this code

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    }
}
```

What will you get?
<table>
<thead>
<tr>
<th><strong>The Takeaway</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is a/an</strong></td>
</tr>
<tr>
<td>object</td>
</tr>
<tr>
<td>dot operator</td>
</tr>
<tr>
<td>Pixel</td>
</tr>
<tr>
<td>property</td>
</tr>
<tr>
<td>method</td>
</tr>
<tr>
<td>ASCII table</td>
</tr>
<tr>
<td>RGB</td>
</tr>
<tr>
<td>HSL</td>
</tr>
</tbody>
</table>

*Homework: Look up what this is!*
</CS105>