Getting the most out of

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http://michaelvandaniker.com/blog/2010/03/10/getting-the-most-out-of-axiis

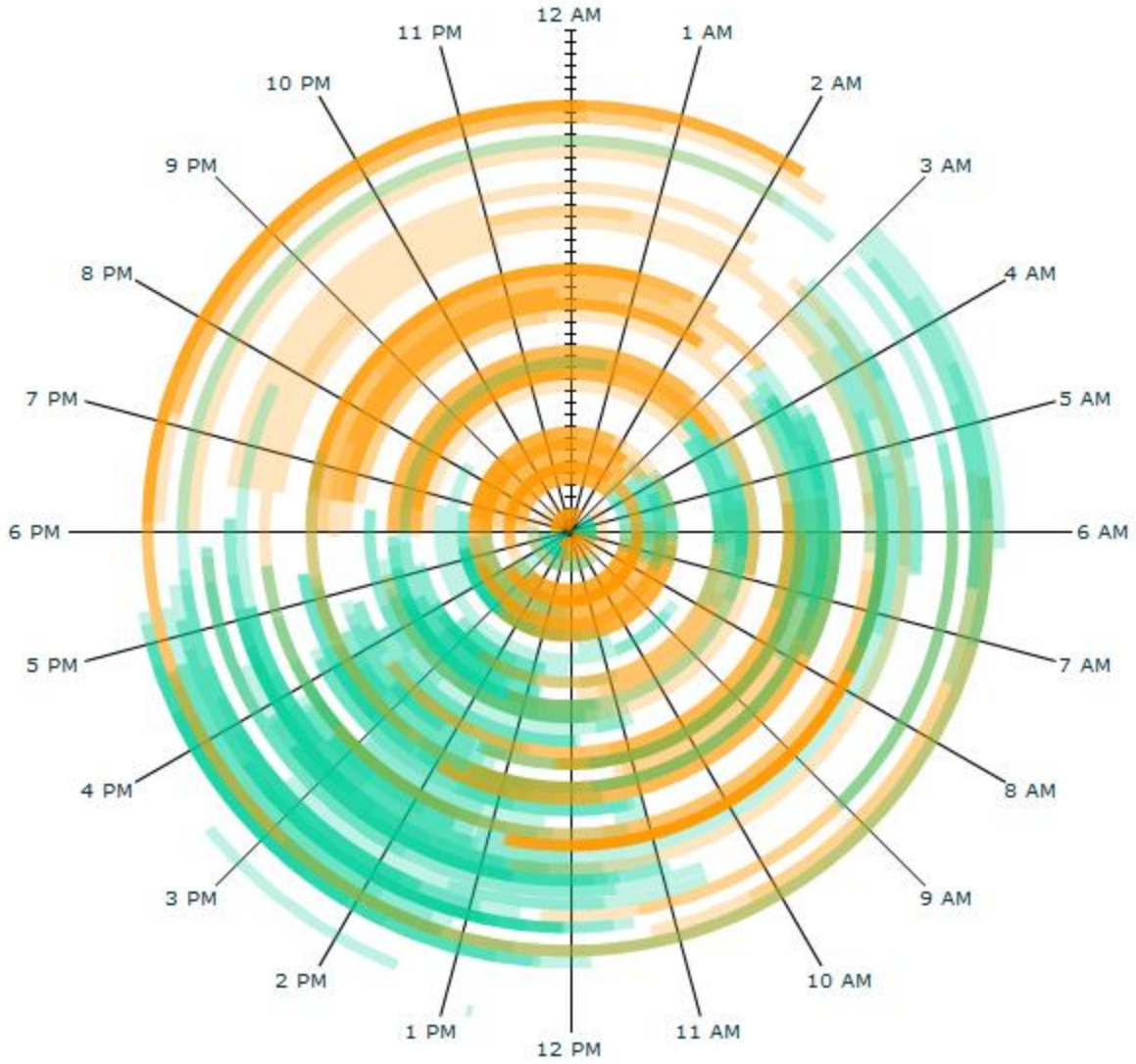
Who am I?

- Data Visualization Manager @ University of Maryland Center for Advanced Transportation Technology Laboratory

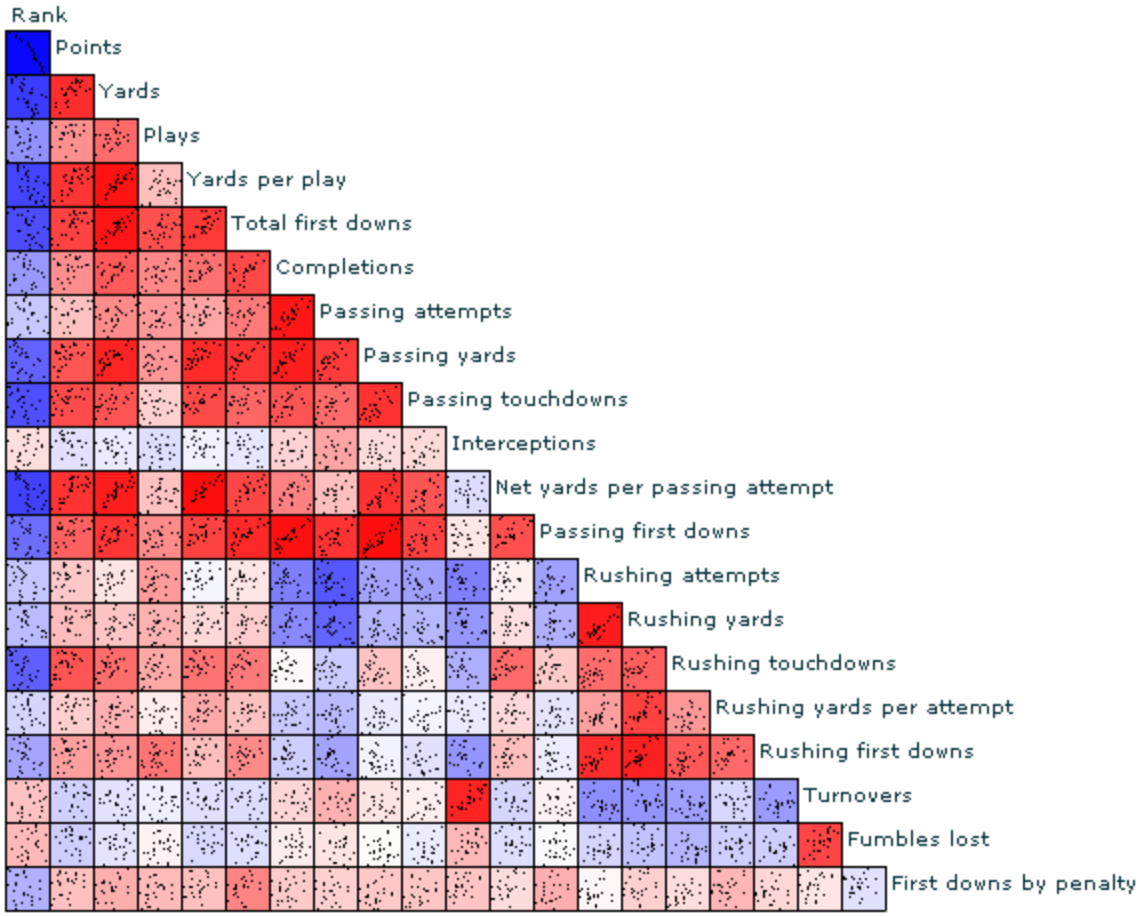
Where we're going today

- Defining Axiis
- How Axiis works
- Writing custom, data-driven layouts
- Adding interactivity
- Using the pre-built visualizations parts
- Tips and tricks

Some visualizations to think about



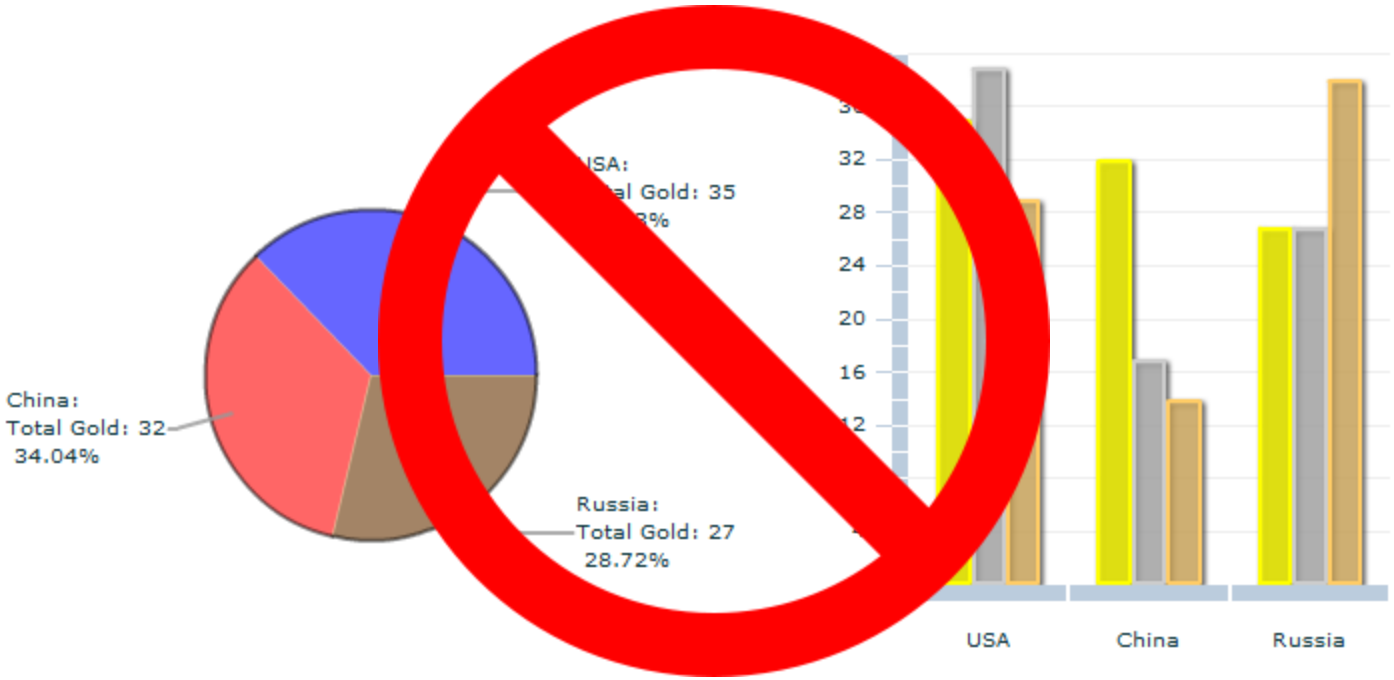
Some visualizations to think about



What is Axiis?

According to almost any resource…

Markup-based data visualization framework



It's not a re-implmentation of the Flex Data Visualization Components and it's not a component library

What is Axiis?

Data-driven Degrafa manipulation engine

```
<axiis:BaseLayout id="hLayout"
    dataProvider="{dataProvider}">
    <axiis:referenceRepeater>
        <axiis:GeometryRepeater>
            <axiis:geometry>
                <degrafa:RegularRectangle
                    width="{(hLayout.width / hLayout.itemCount)}"
                    height="{hLayout.height}"/>
            </axiis:geometry>
            <axiis:modifiers>
                <axiis:PropertyModifier property="x"
                        modifier="{hLayout.width / hLayout.itemCount}"/>
            </axiis:modifiers>
        </axiis:GeometryRepeater>
    </axiis:referenceRepeater>
    <axiis:drawingGeometries>
        <degrafa:RegularRectangle x="{hLayout.currentReference.x}"
            y="{hLayout.currentReference.y}"
            width="{hLayout.currentReference.width}"
            height="{hLayout.currentReference.height}">
            <degrafa:stroke>
                <degrafa:SolidStroke color="0"/>
            </degrafa:stroke>
        </degrafa:RegularRectangle>
```

Degrafa

- Declarative graphics framework

```
graphics.clear();
graphics.lineStyle(1, 0, .5);
graphics.beginFill(0xff0000, .5);
graphics.drawRect(0, 0, 100, 100);
graphics.endFill();
```

```
<degrafa:RegularRectangle x="0" y="0" width="100" height="100">
    <degrafa:stroke>
        <degrafa:SolidStroke color="0" alpha=".5"/>
    </degrafa:stroke>
    <degrafa:fill>
        <degrafa:SolidFill color="0xff0000" alpha=".5"/>
    </degrafa:fill>
</degrafa:RegularRectangle>
```

Axiis in practice

- Running map
- Smith chart
- Buoy monitor
- Browser statistics visualization

How Axiis works

- Many visualizations are based on two rule sets
  - “Layout rules”
  - “Data rules”

How Axiis works

- (Get your data ready)
- Drop in your data
- Describe a layout pattern in MXML
- Draw a picture using the data and the rules of the pattern

How Axiis works

- Get your data ready
  - Arrays and ArrayCollections
  - Support for transforming XML and CSV

How Axiis works

- Drop in your data
  - currentDatum
  - currentIndex
  - currentLabel
  - currentValue

How Axiis works

- Describe layout pattern in MXML
  - GeometryRepeater
  - PropertyModifier
- currentReference

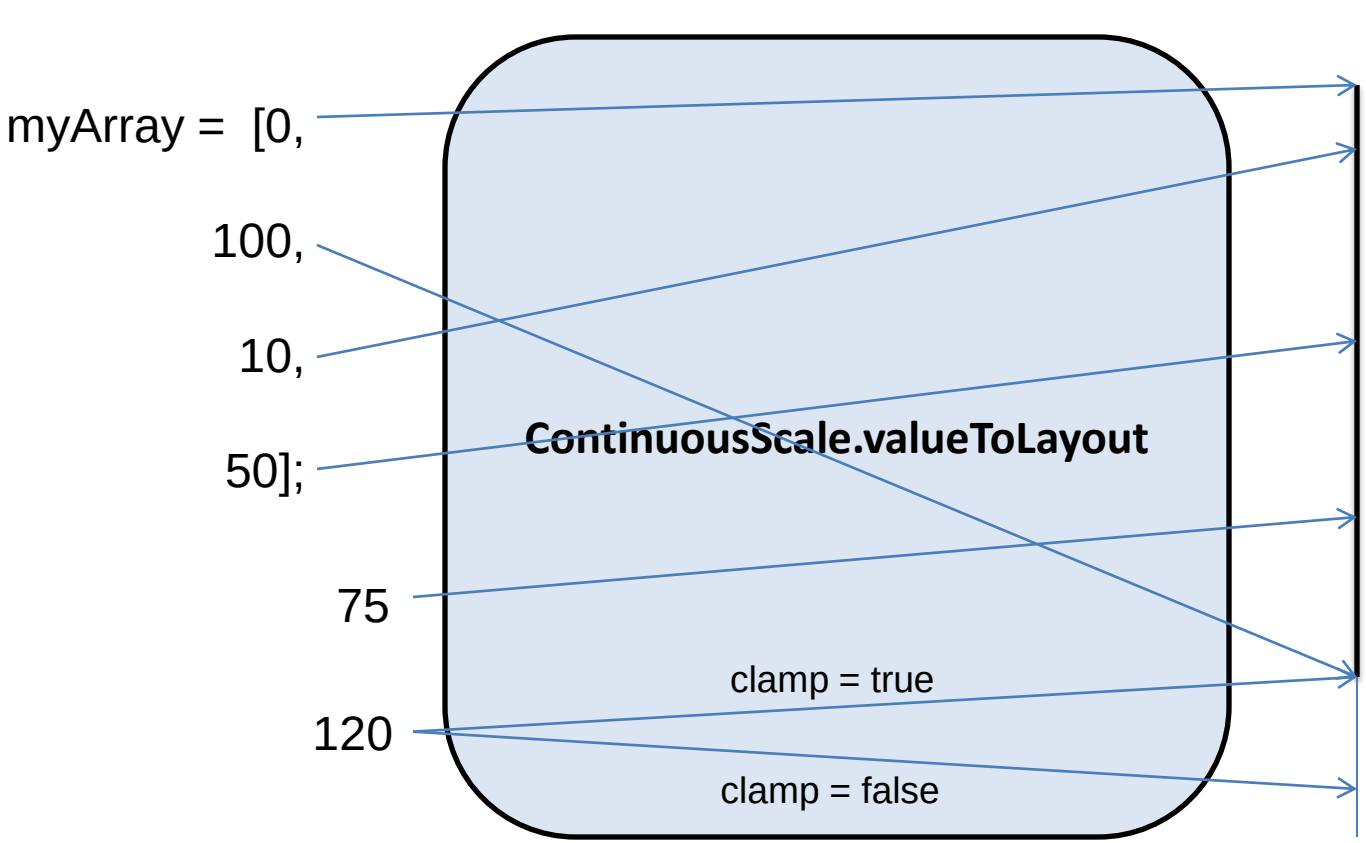
How Axiis works

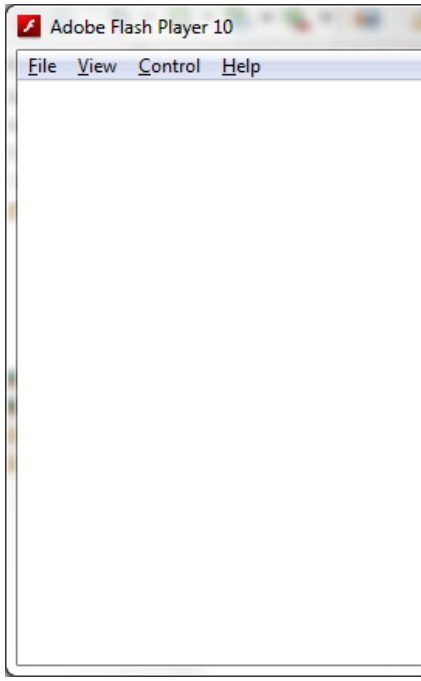
- Draw a picture using the data and the rules of the pattern
  - currentReference
  - currentDatum
  - currentLabel
  - currentIndex
  - currentValue

Scales

- Mapping a data value to a screen position
  - **`valueToLayout(value,clamp,invert):Number`**
- And reverse
  - **`layoutToValue(layout,clamp,invert):*`**
- Types of scales
  - ContinuousScale
    - LinearScale
    - LogScale
    - DateTimeScale
  - CategoricalScale

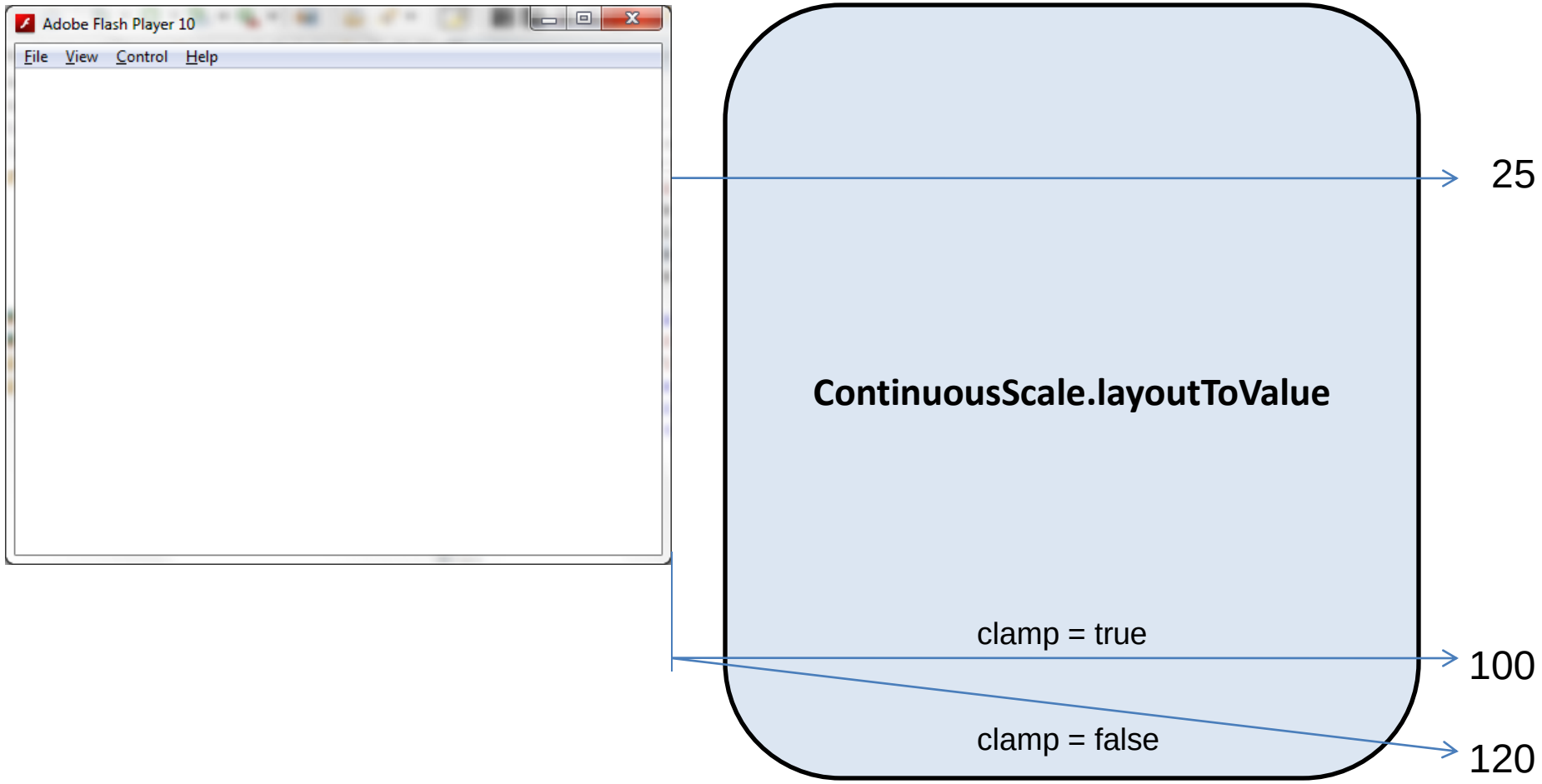
ContinuousScale



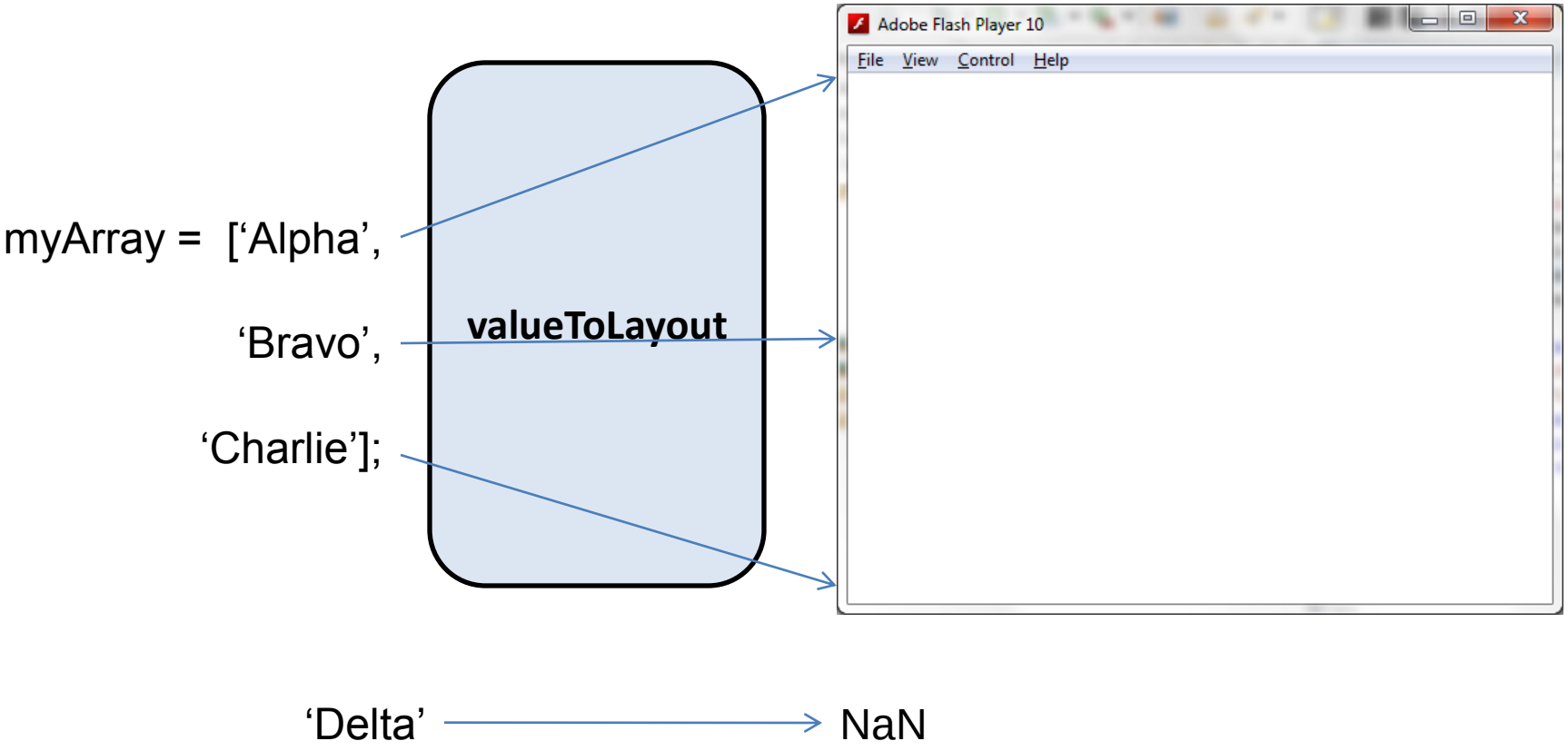


ContinuousScale

myArray = [1..100]

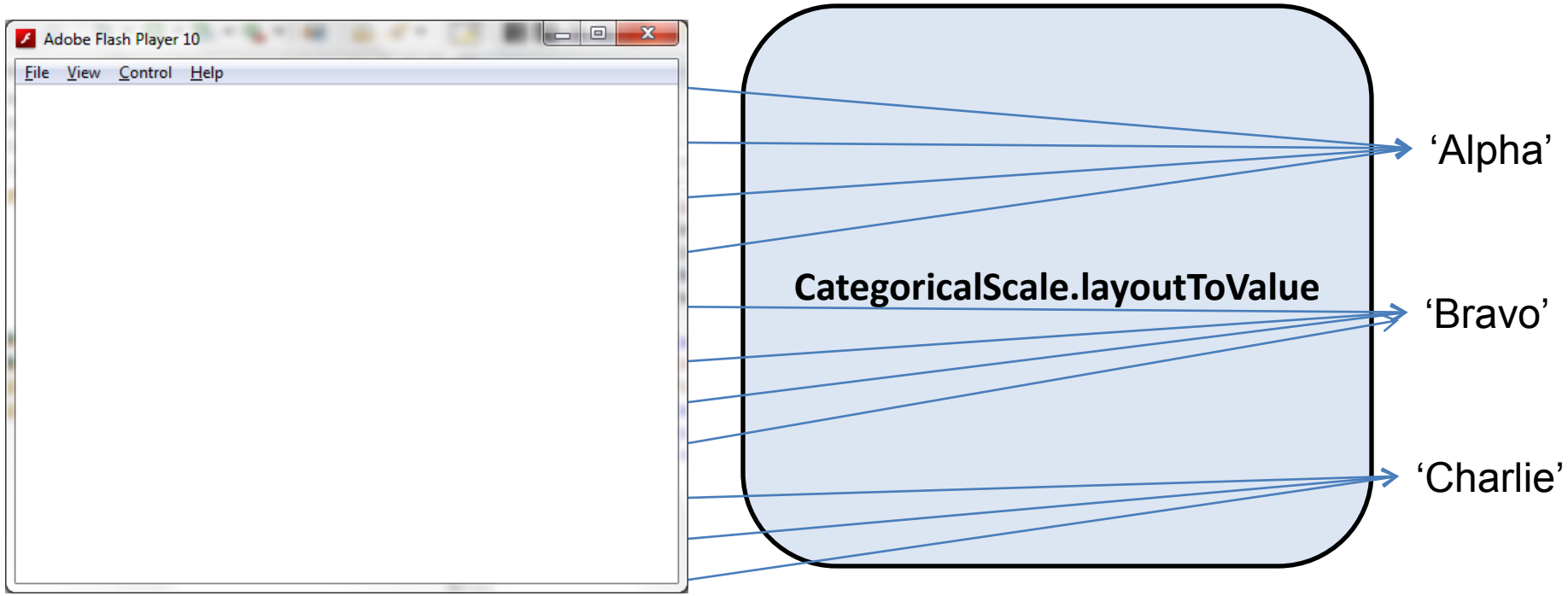


CategoricalScale



CategoricalScale

myArray = [‘Alpha’,‘Bravo’,‘Charlie’];

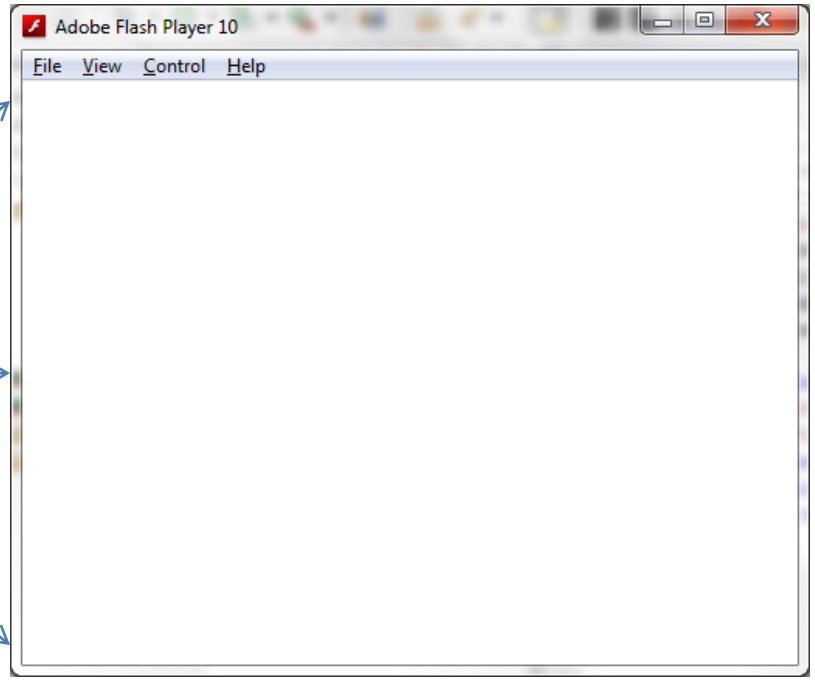


Inverted scales

myArray = [‘Alpha’,

‘Bravo’,

‘Charlie’];



Scales

- Custom ranges
  - minValue, maxValue, minLayout, maxLayout
- computedMinimum
- computedMaximum
- computedAverage

Hierarchical data visualizations

- Child layouts

Adding interactivity

- States
- Data tips
- Per item MouseEvents
  - Debugging with events
- Per layout data filtering
- Conditional geometry properties

Built in visualizations

- Axis
- ConcentricWedgeLayout
- WedgeStack

Data binding shortcuts

- You wouldn’t do this:

```
var xyOver2:Number = x * y / 2;
var xyOver3:Number = x * y / 3;
```

- So don’t do this:

```
<mx:Label text="{x * y / 2}"/>
<mx:Label text="{x * y / 3}"/>
```

Data binding shortcuts

- Use expression classes!
  - BooleanExpression
  - NumericExpression
  - UntypedExpression

```
<axiis:NumericExpression id="product" value="{x * y}"/>
<mx:Label text="{product.value / 2}"/>
<mx:Label text="{product.value / 3}"/>
```

Where does Axiis stand?

- Beta 1.1
- Compiled with Flex 3.5
- Comes with a build of Degrafa's Origin branch.
- Currently not 100% compatible with Flex 4

Get Axiis: http://www.axiis.org/

Where is Axiis going?

- Revamped pipeline - item renderer pattern
- Animations
- More data processing functionality
- Flex 4 compatibility
- Flex 4 state syntax?
- API likely to change, but you can still use it to do something useful now.

Questions about that?