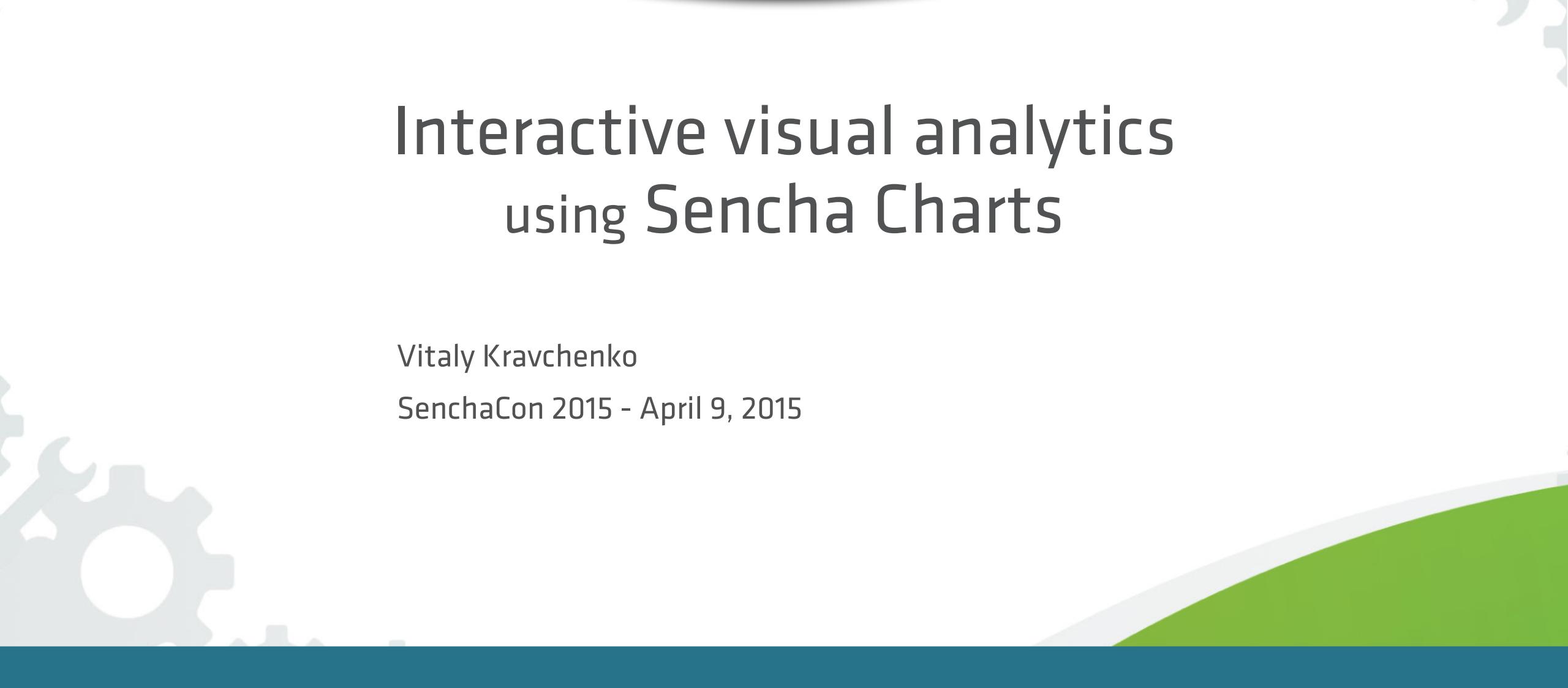


SENCHA CON 2015



DESIGN
DEVELOP
DEPLOY



Interactive visual analytics using Sencha Charts

Vitaly Kravchenko

SenchaCon 2015 - April 9, 2015



SENCHA CON
2 0 1 5

DESIGN | DEVELOP | DEPLOY

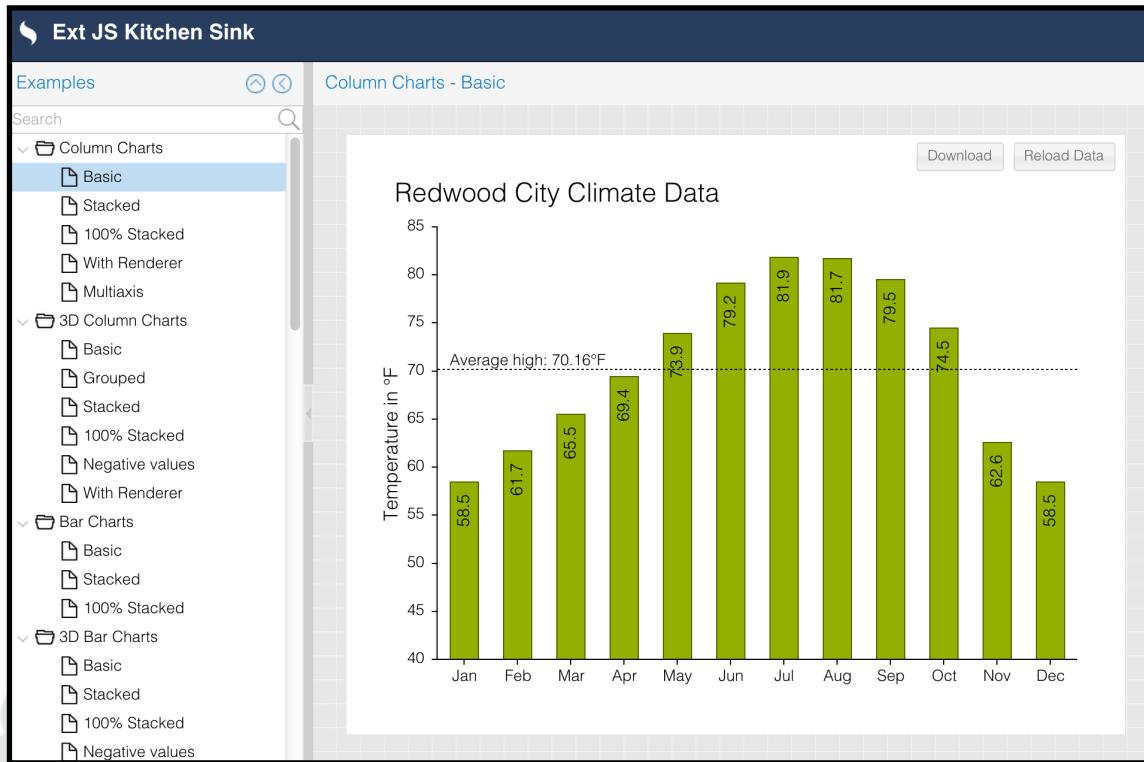
Vitaly Kravchenko

Graphics Engineer, Sencha

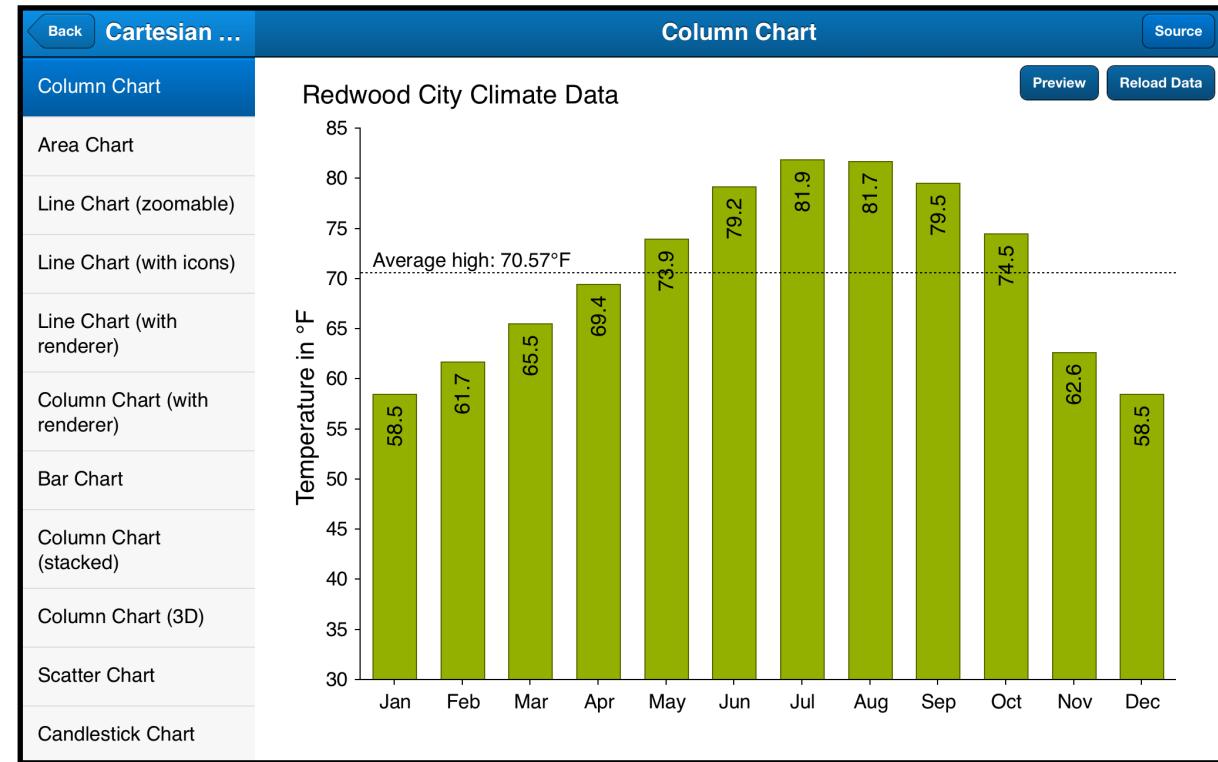


Ext Core

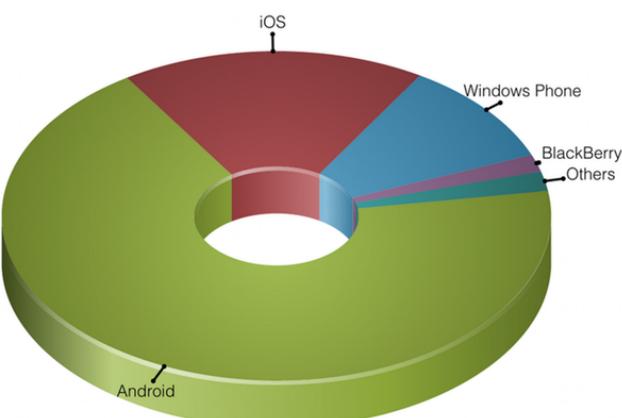
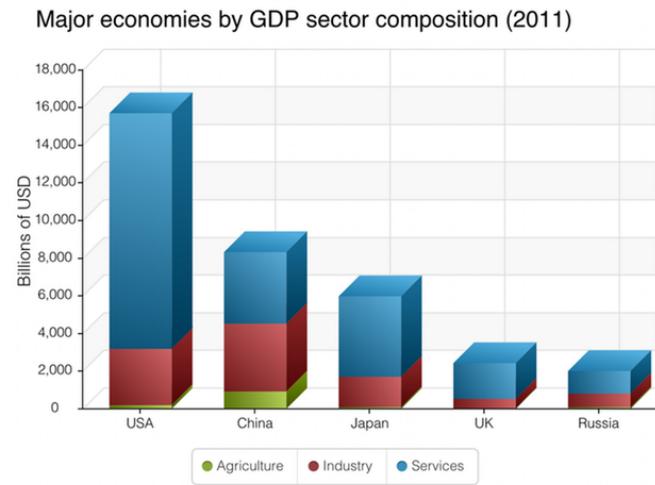
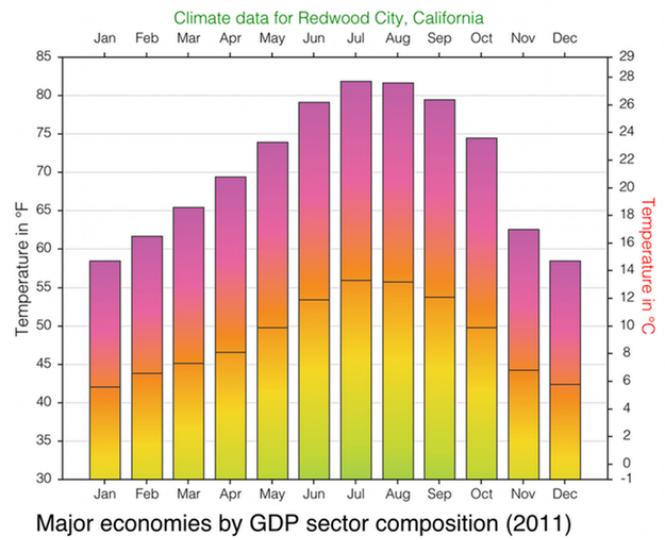
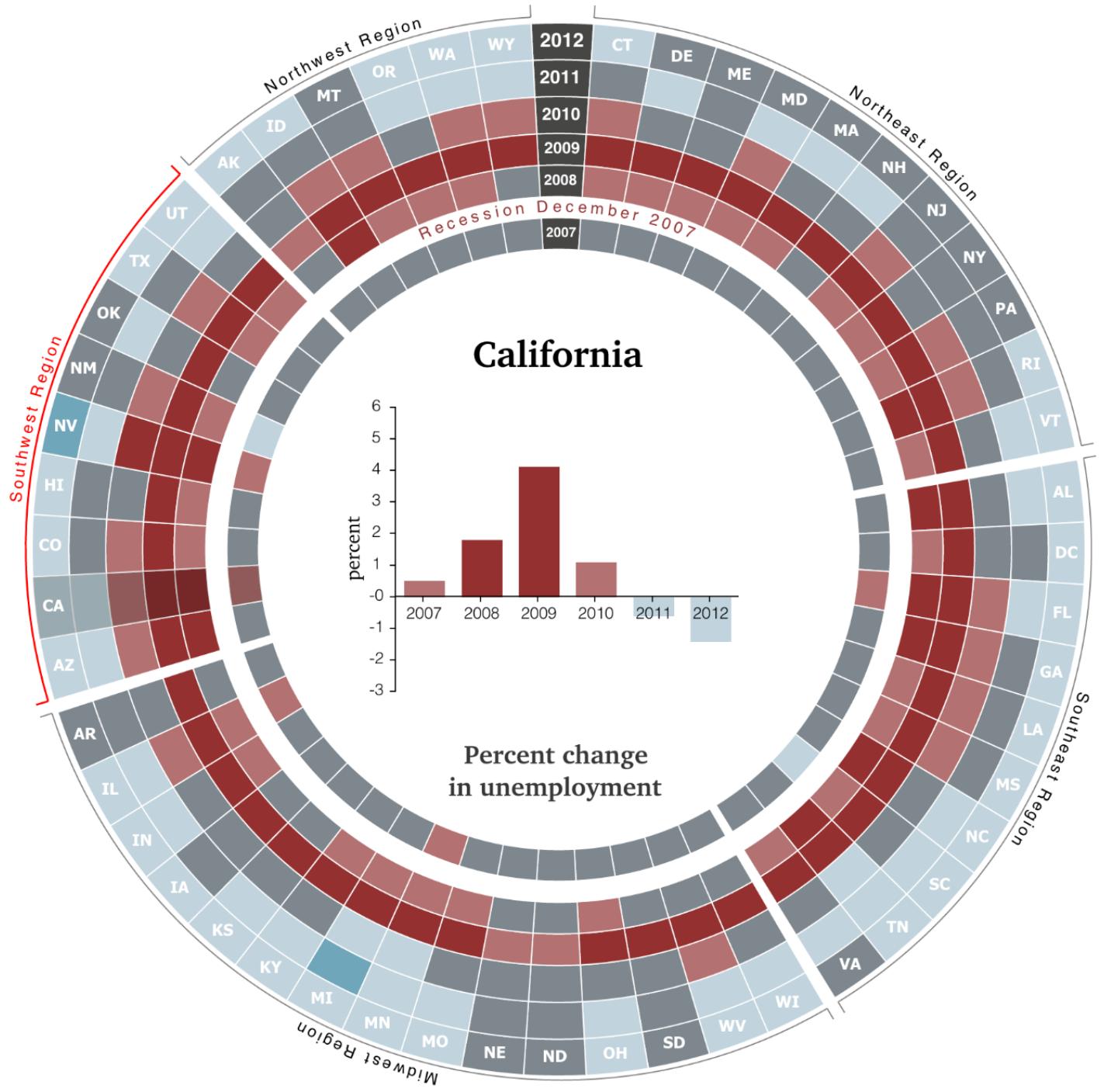
Charts and Draw packages are shared by both toolkits



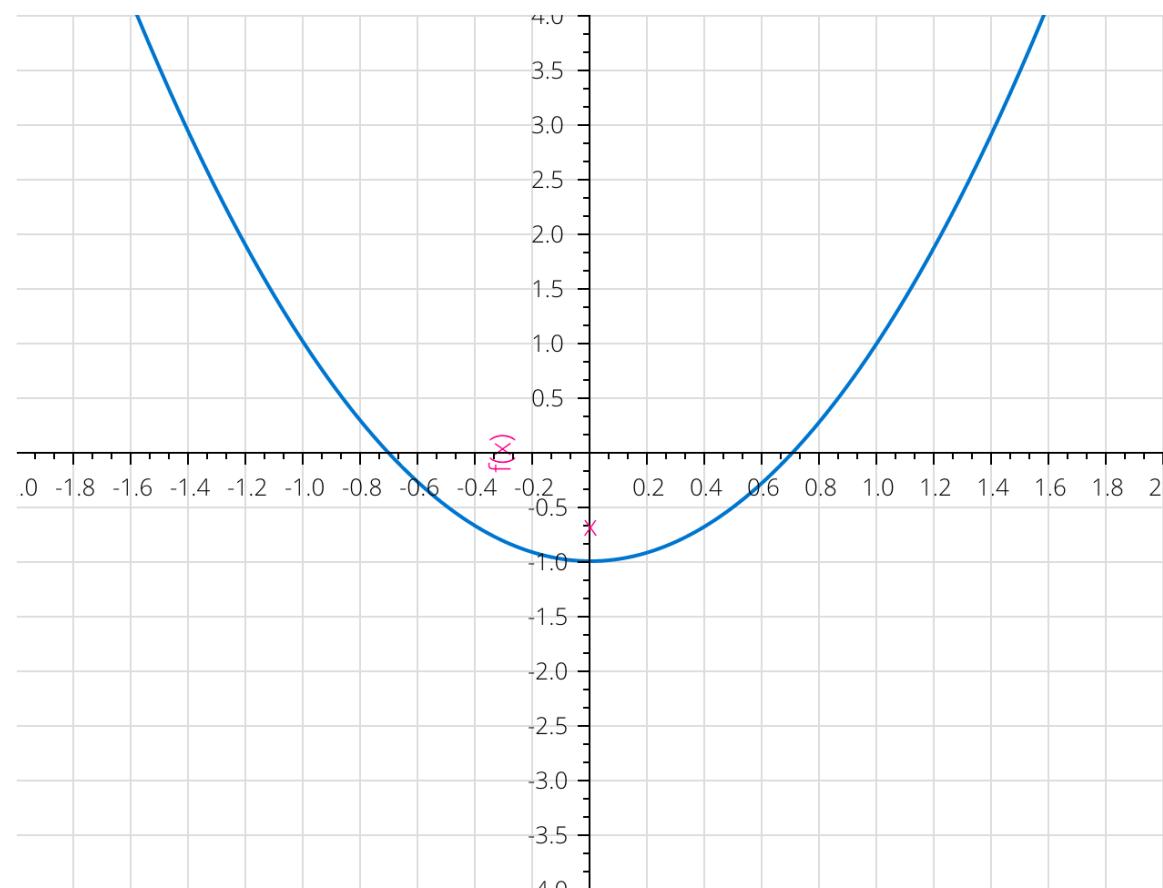
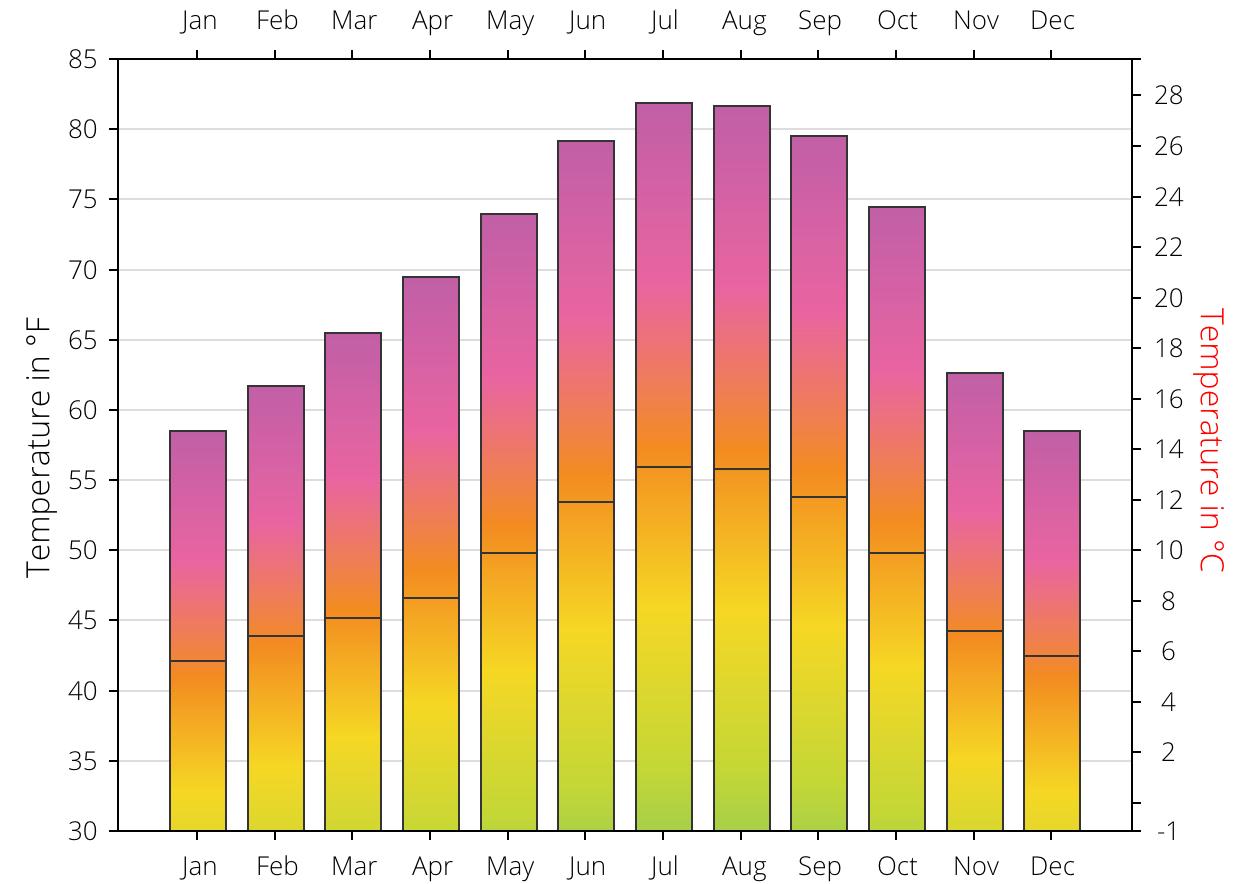
Classic



Modern

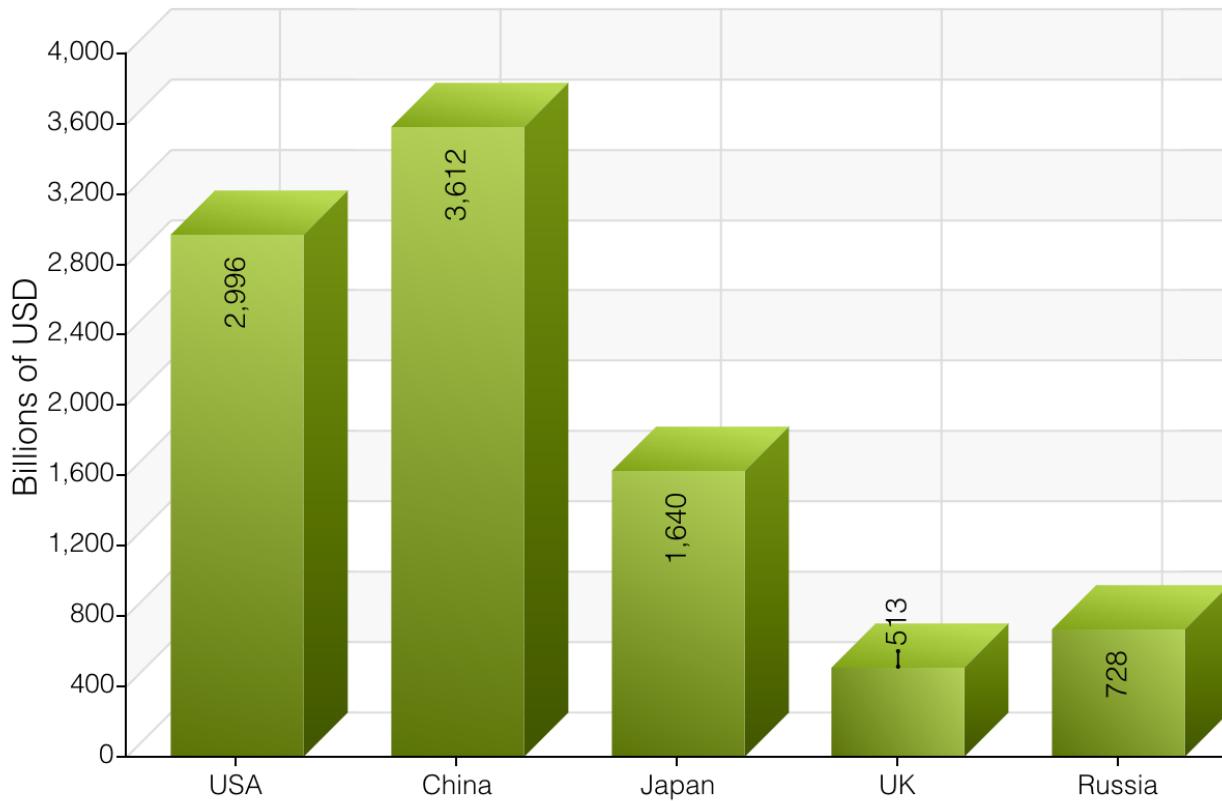


Climate data for Redwood City, California



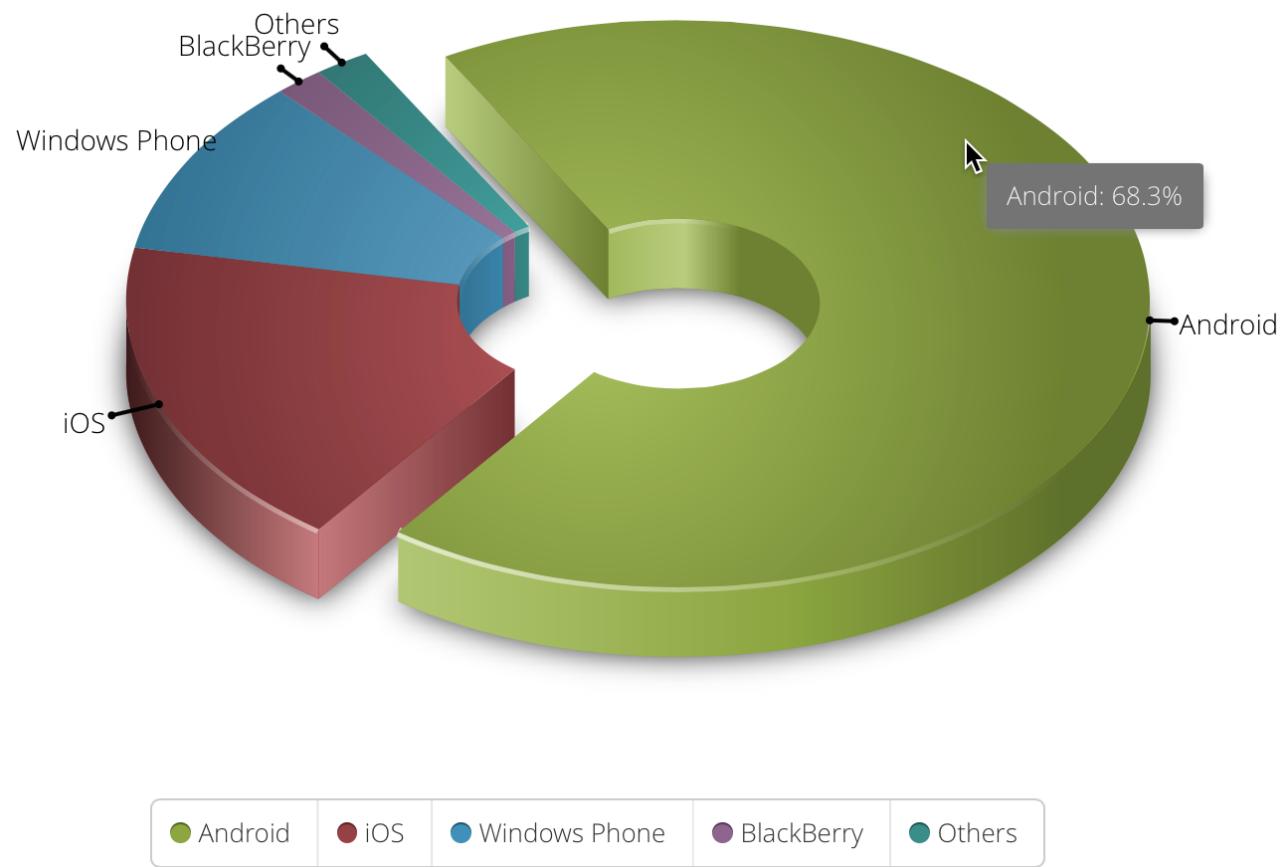
3D Bar

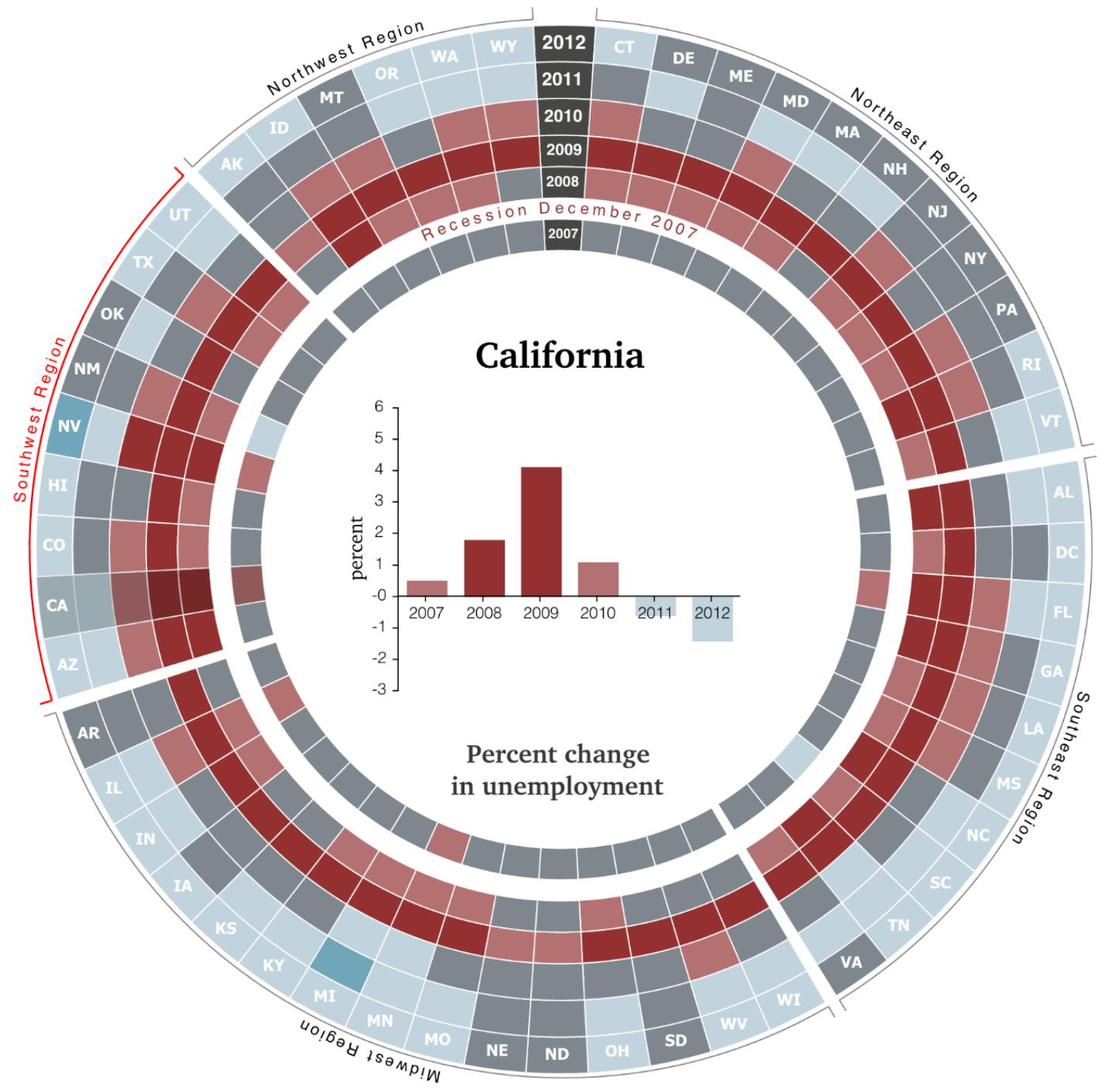
```
items: {  
    xtype: 'cartesian',  
    series: {  
        type: 'bar3d'  
    },  
    axes: [{  
        type: 'numeric3d',  
        position: 'left'  
    }, {  
        type: 'category3d',  
        position: 'bottom'  
    }]  
}
```



3D Pie

```
series: {  
    type: 'pie3d'  
}
```





2007-2012

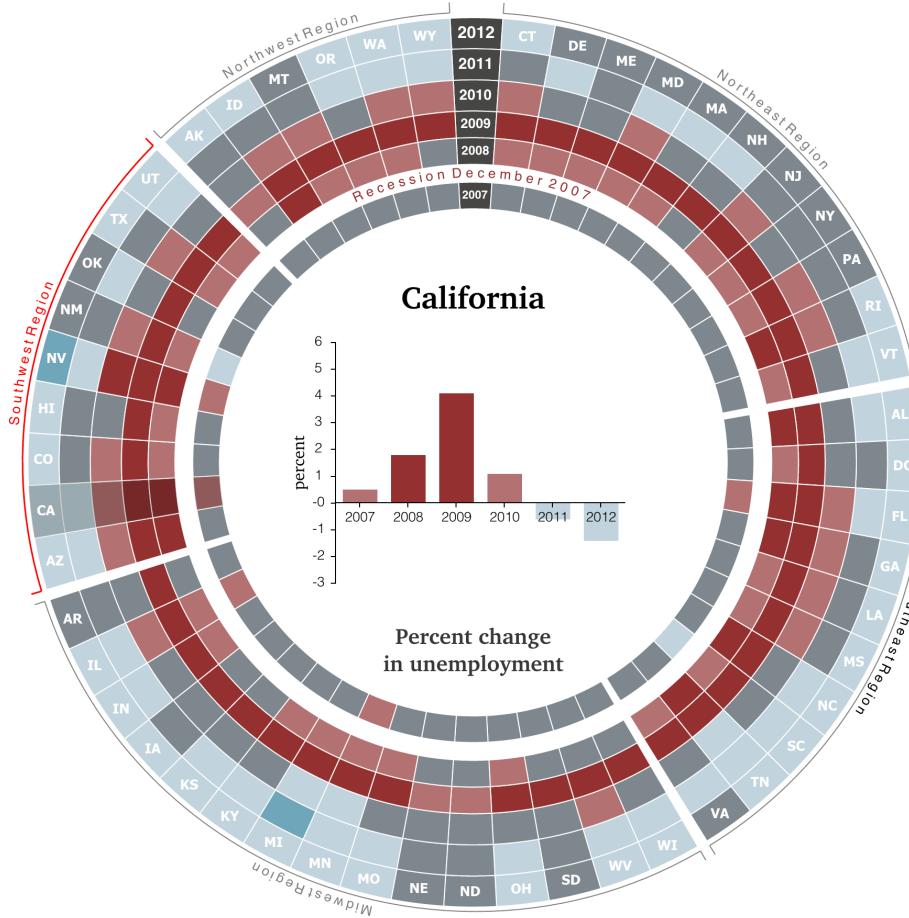
Changes in U.S. Unemployment

Forty-three states and the District of Columbia added jobs in the past 12 months, but the US has 4.8 million fewer jobs than it did in 2008. North Dakota led the pack with a 7.2 percent increase, but the national growth rate was only 1.1 percent. Seven states lost jobs.

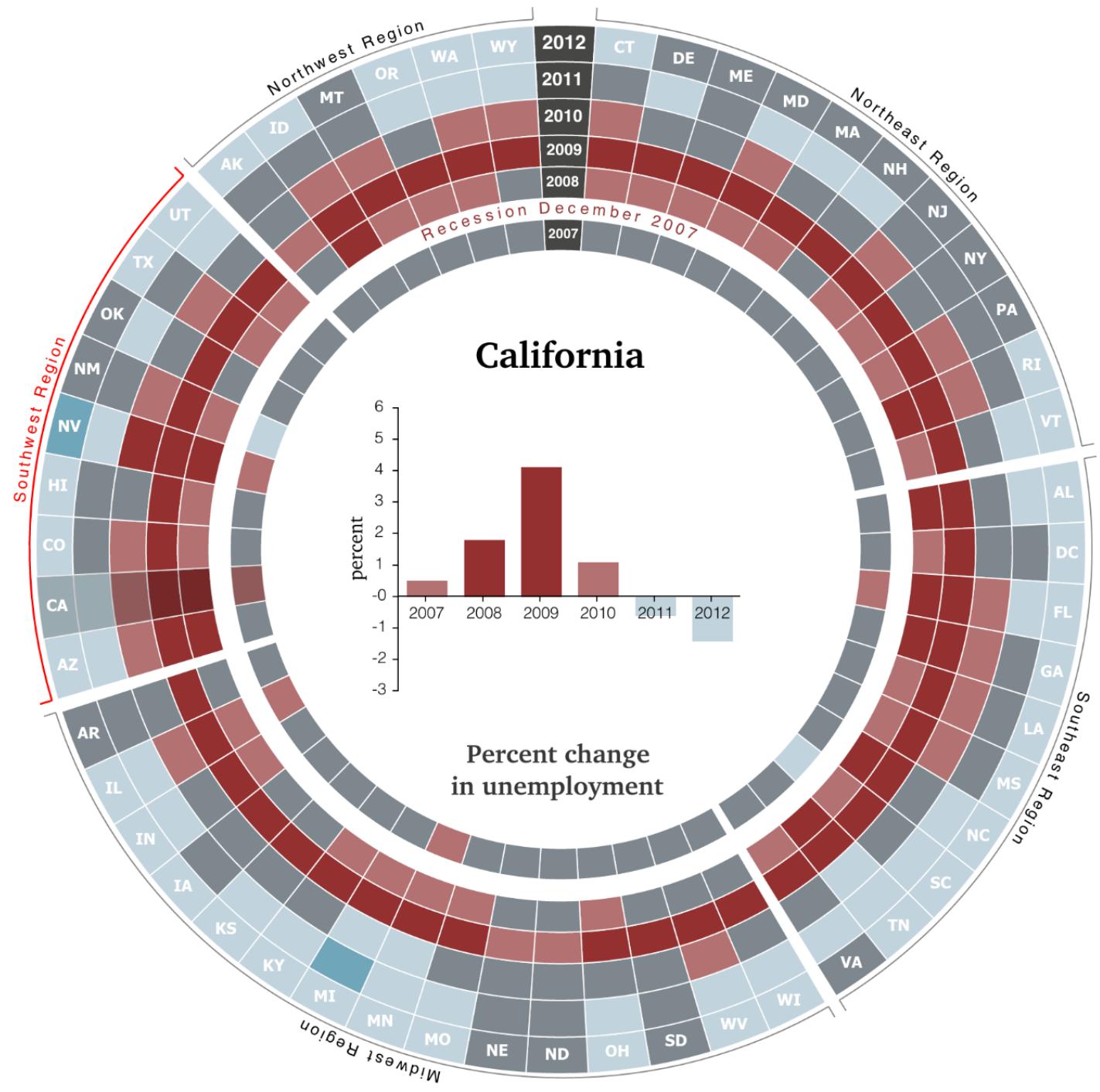
Unemployment

- rose by more than 1.5%
- rose by 0.5% to 1.5%
- rose by less than 0.5%
- fell by 0.5% to 1.5%
- fell by more than 1.5%

Roll over a state to learn more.



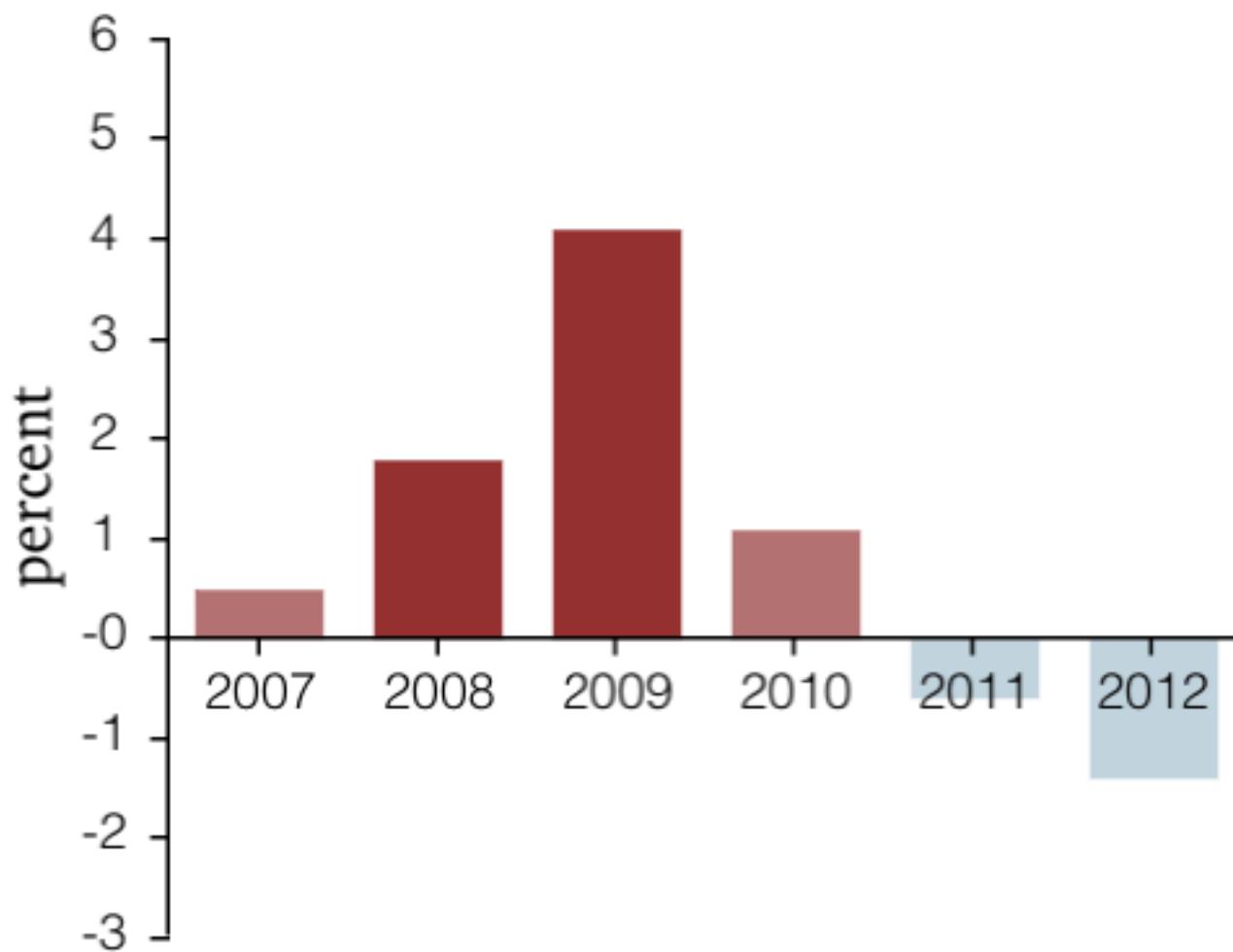
Challenge

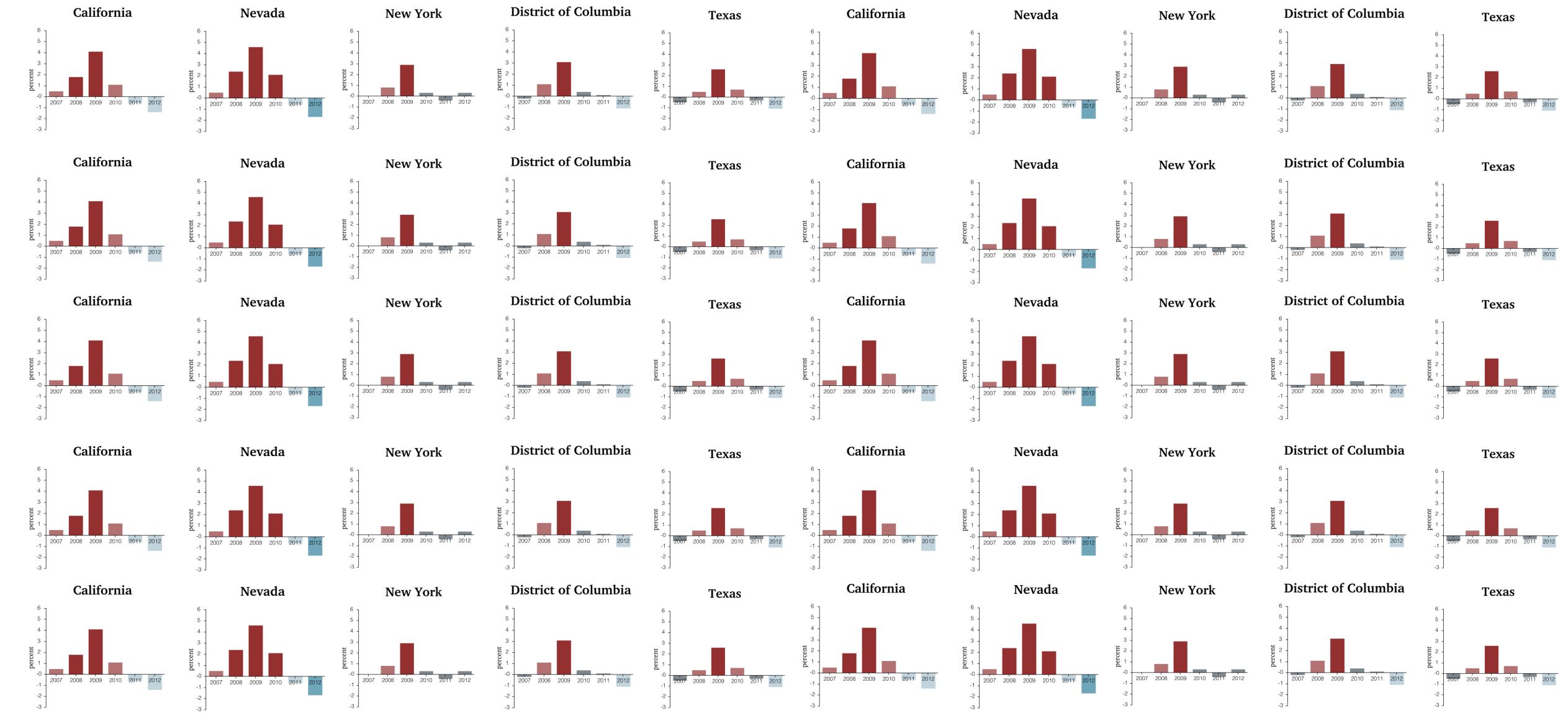


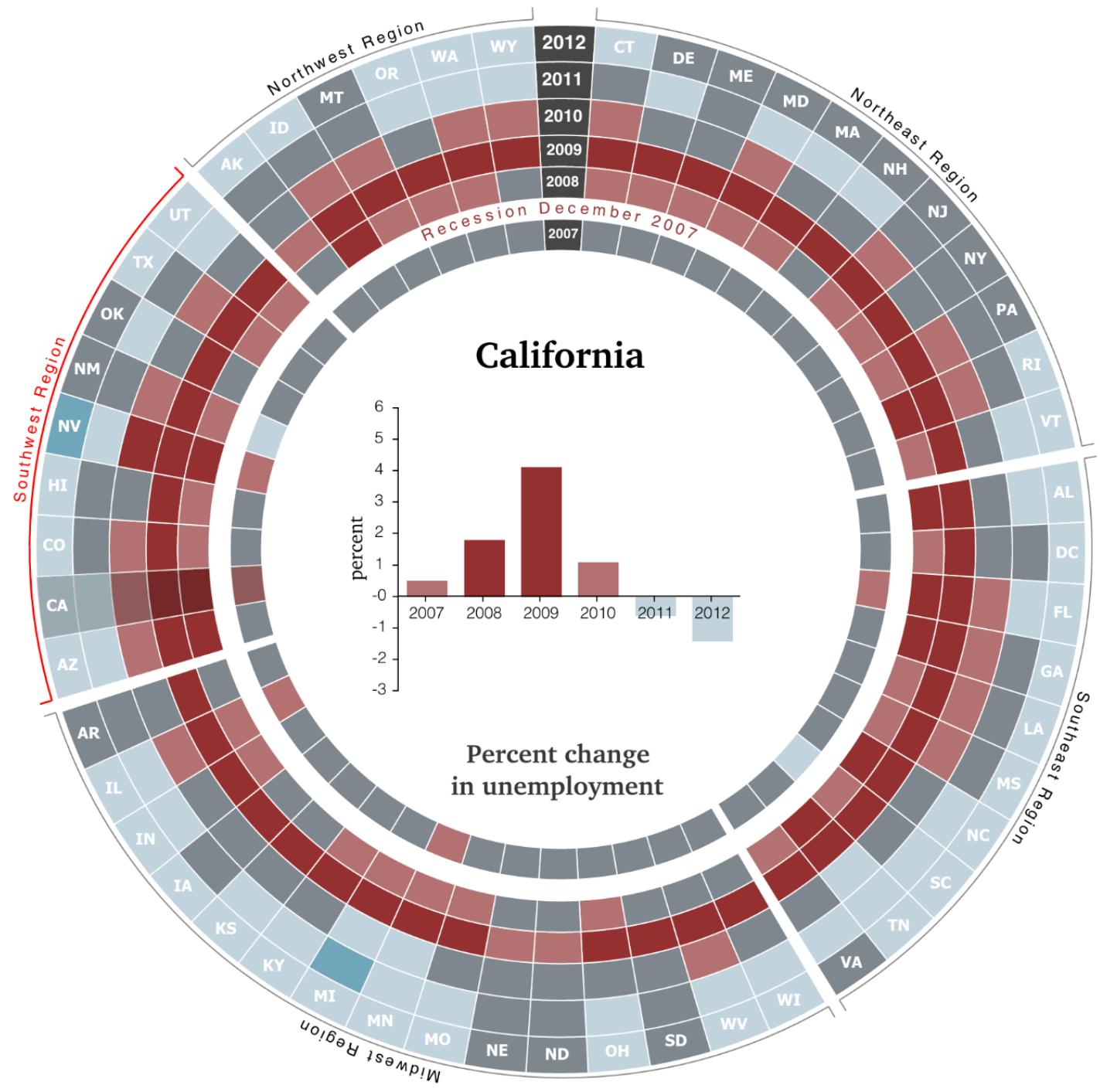




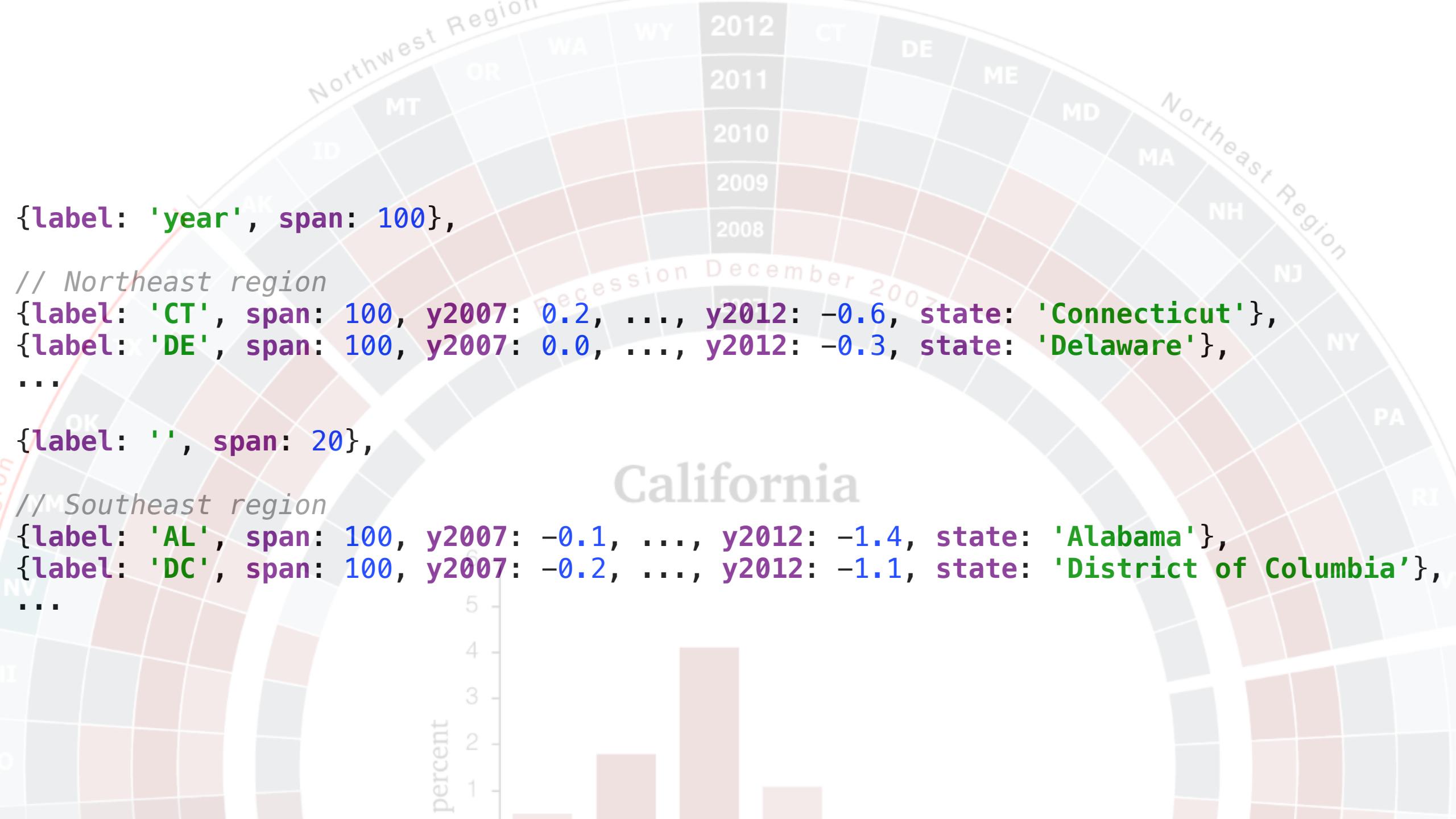
California



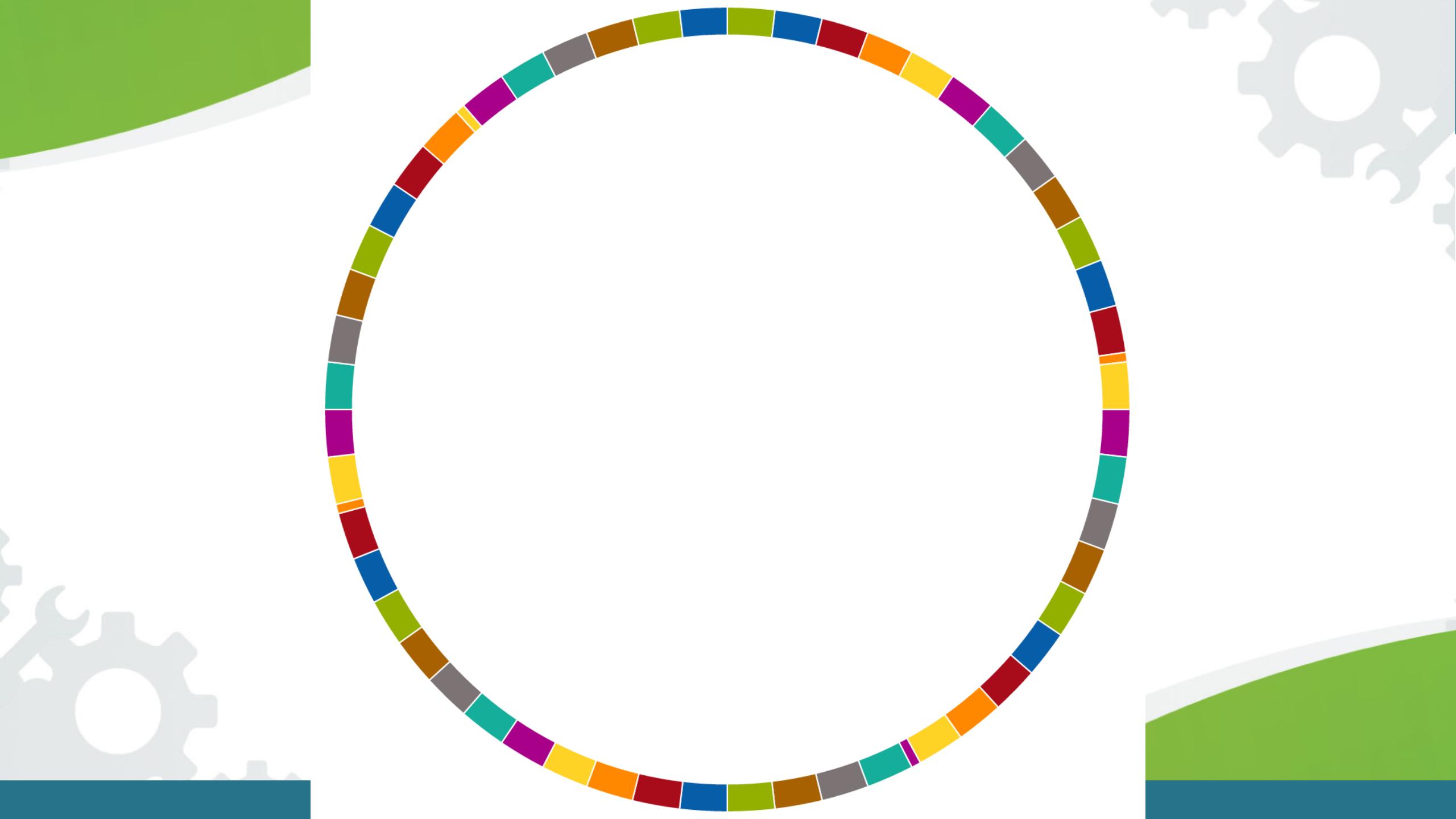




Data



```
items: [
  {
    xtype: 'polar',
    store: {
      type: 'unemployment'
    },
    series: [{  
      type: 'pie',
      angleField: 'span',
      donut: 93
    }]
  }
]
```

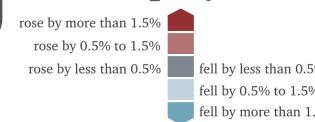


Changes in U.S. Unemployment

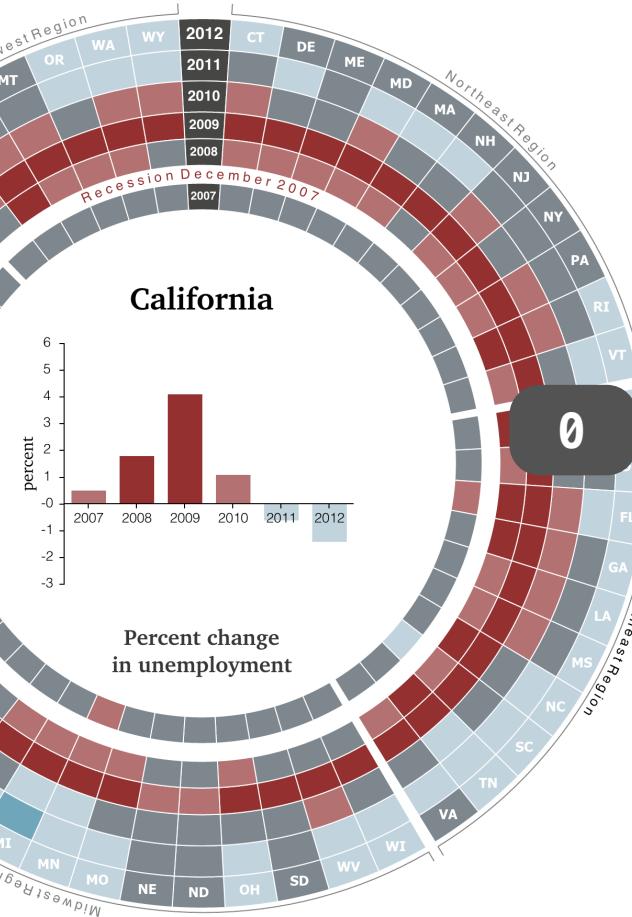
Forty-three states and the District of Columbia lost jobs in the past 12 months, but the U.S. led the pack with a 7.2 percent increase, but the national growth rate was only 1.1 percent. Seven states lost jobs.

400

Unemployment



Roll over a state to learn more.



125

```
layout: 'absolute',
width: 990,
```

```
items: [
```

{

```
xtype: 'polar',
```

```
width: '100%',  
height: 1375,
```

```
insetPadding: '400 0 125 0',
```

Adding infographic content

HTML vs Sprites



2007-2012

Changes in U.S. Unemployment

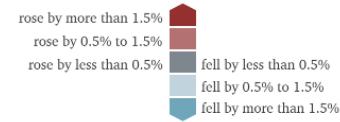
```
sprites: [
  {
    type: 'rect',
    x: 50,
    y: 40,
    width: 890,
    height: 100,
    fillStyle: 'rgb(77, 77, 77)'
  },
  {
    type: 'text',
    text: 'Changes in U.S. Unemployment',
    font: 'bold 54px Charter',
    fillStyle: 'white',
    x: 70,
    y: 120
  }
]
```

2007-2012

Changes in U.S. Unemployment

Forty-three states and the District of Columbia added jobs in the past 12 months, but the US has 4.8 million fewer jobs than it did in 2008. North Dakota led the pack with a 7.2 percent increase, but the national growth rate was only 1.1 percent. Seven states lost jobs.

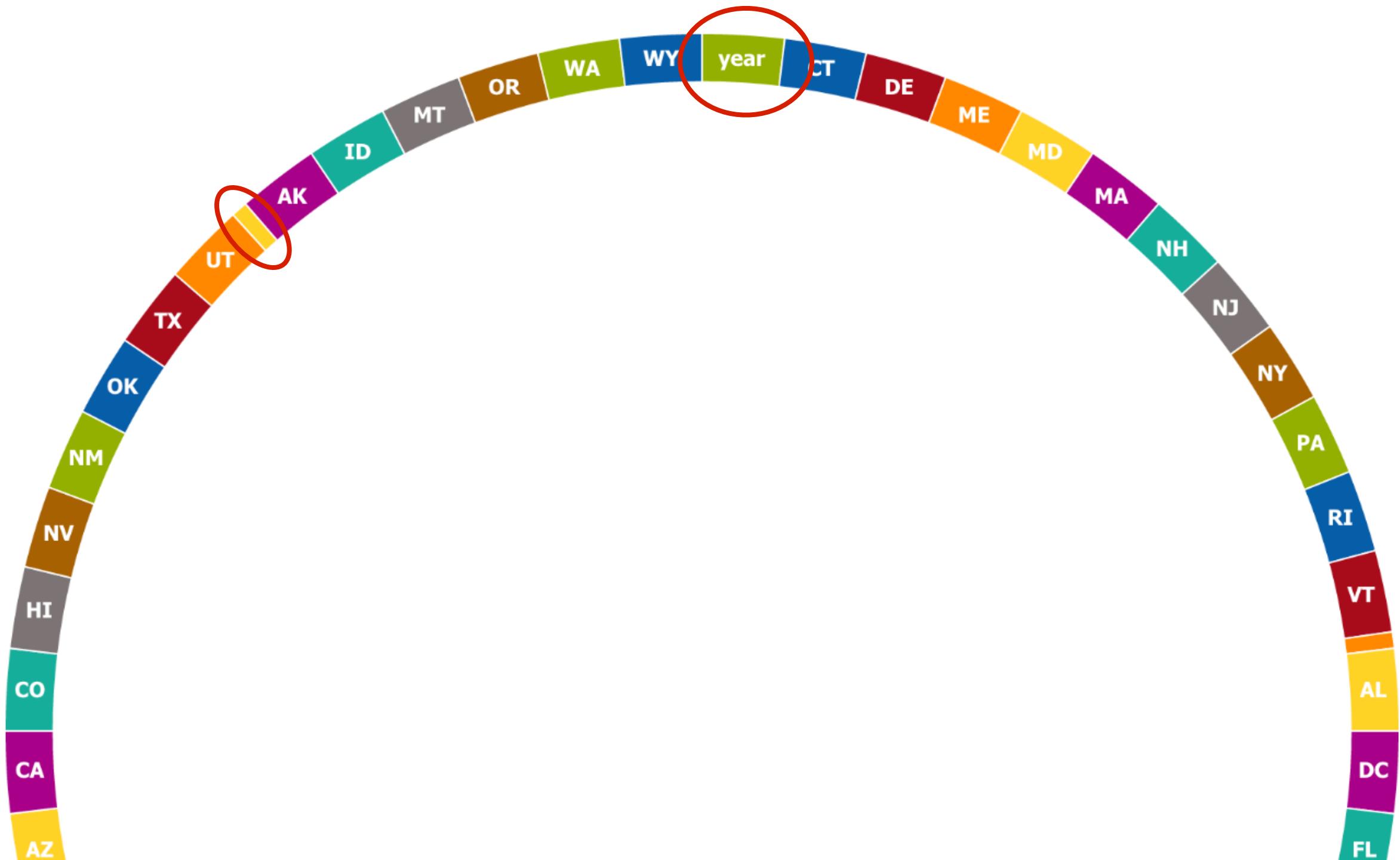
Unemployment



Roll over a state to learn more.



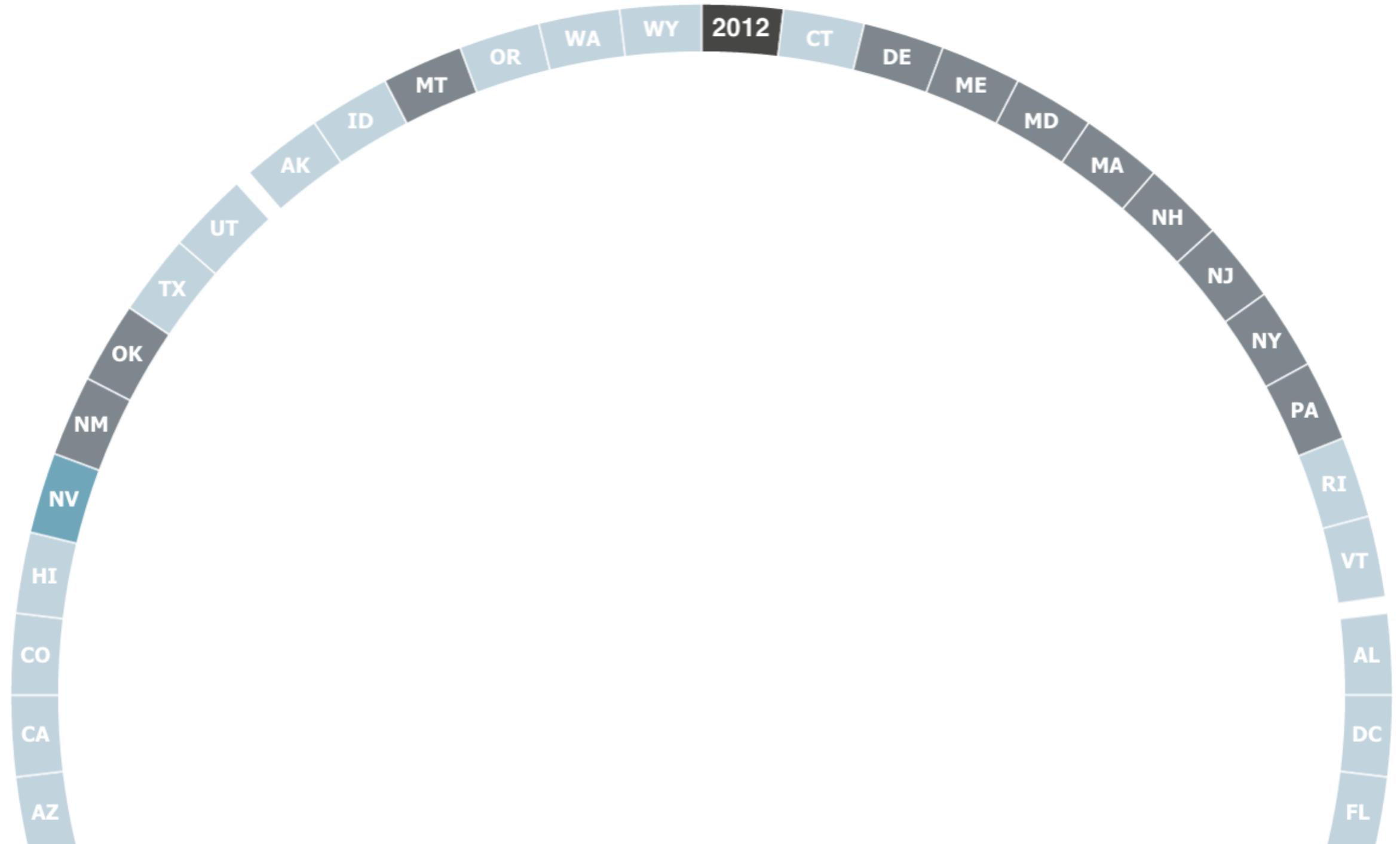
```
series: {  
    type: 'pie',  
    ...  
    label: {  
        field: 'label',  
        display: 'inside',  
        fillStyle: 'white',  
        fontSize: 13,  
        fontWeight: 'bold',  
        fontFamily: 'Tahoma'  
    }  
}
```



```
series: {  
    type: 'pie',  
    angleField: 'span',  
    ...,  
    label: {  
        field: 'label',  
        ...,  
        renderer: 'onLabelRender2012'  
    },  
    renderer: 'onSliceRender2012'  
}
```

```
onLabelRender2012: function (text, sprite, config, data, index) {
  if (text === 'year') {
    return {
      text: '2012',
      font: 'bold 16px sans-serif'
    };
  }
}
```

```
onSliceRender2012: function (sprite, config, data, index) {  
    var record = data.store.getAt(index),  
        label = record.get('label'),  
        unemployment = record.get('y2012'),  
        style = {};  
  
    → if (label === '') {  
        style.fillStyle = 'none';  
        style.strokeStyle = 'none';  
    → } else if (label === 'year') {  
        style.fillStyle = '#444';  
    } else {  
    →     style.fillStyle = this.getStateColor(unemployment);  
    }  
    return style;  
}
```



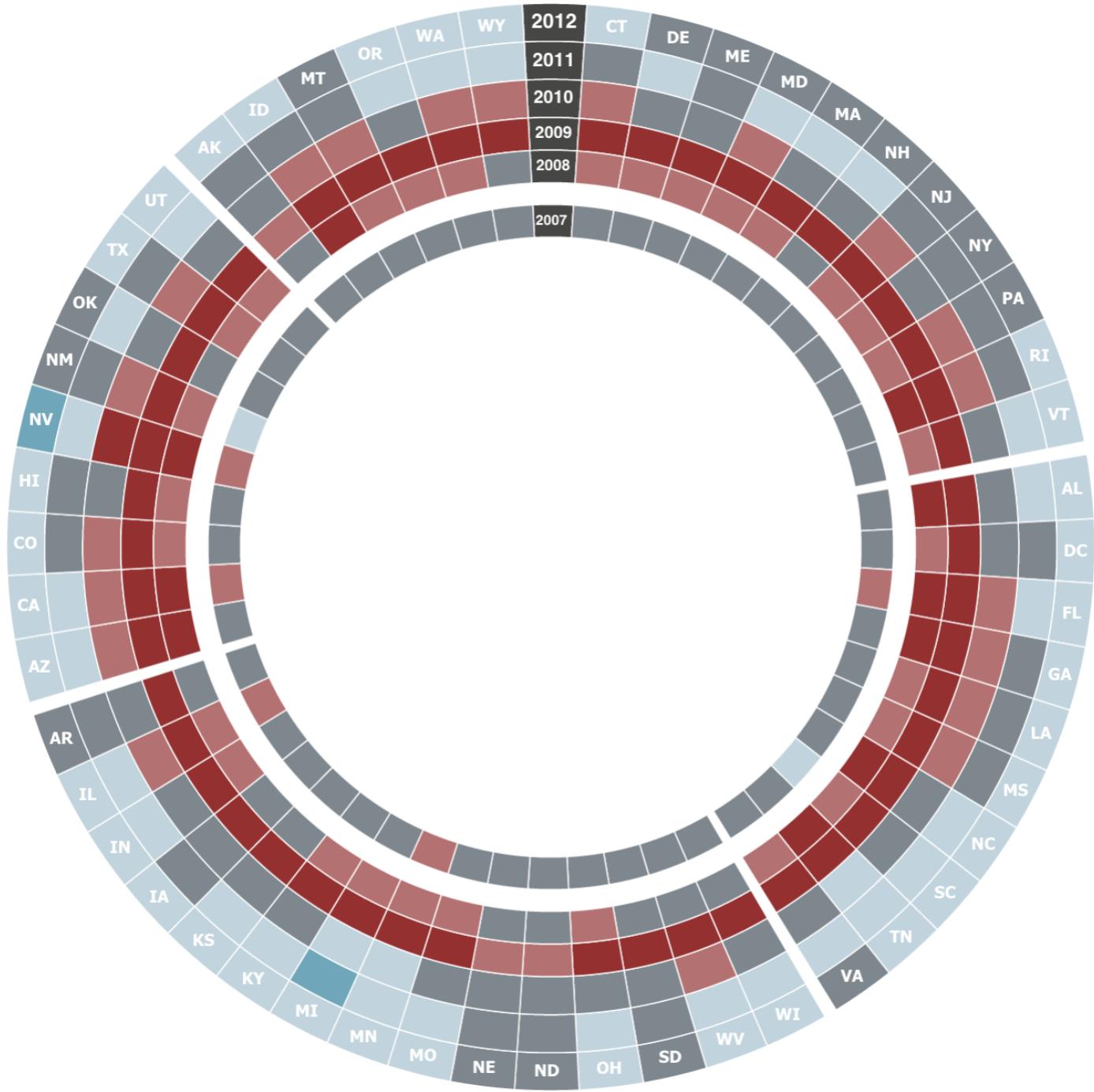
```
series: [{

    type: 'pie',
    angleField: 'span',

    donut: 93
}, {
    type: 'pie',
    angleField: 'span',

    radiusFactor: 93,
    donut: 86
}, {
    type: 'pie',
    angleField: 'span',

    radiusFactor: 86,
    donut: 79,
}, {
    ...
}
```



Interactions

```
highlight: true
```

```
highlightCfg: {  
    margin: 20  
}
```

```
highlight: {  
    fillStyle: 'yellow'  
}
```

```
highlight: {  
    fillStyle: 'yellow',  
    margin: 0  
}
```

```
highlightCfg: {  
    fillStyle: 'yellow'  
}
```

Performance Optimization

```
{  
  xtype: 'polar',  
  → interactions: ['itemhighlight'],  
  series: [  
    {  
      type: 'pie',  
      angleField: 'span',  
      → donut: 57,  
      subStyle: {  
        → fillStyle: 'none',  
        strokeStyle: 'none'  
      },  
      highlightCfg: {  
        fillStyle: 'rgba(0,0,0,0.2)'  
      },  
      ...  
    }  
  ]  
}
```

Adding cartesian chart

```
{  
    xtype: 'cartesian',  
  
    width: 350,  
    height: 250,  
  
    x: 300,  
    y: 700,  
  
    series: {  
        type: 'bar',  
  
        xField: 'year',  
        yField: 'percent',  
  
        renderer: 'onBarRender'  
    }  
}
```

```
listeners: {  
    itemhighlight: 'onItemHighlight'  
}
```

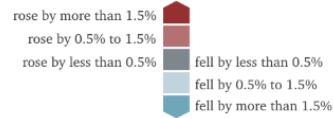
```
onItemHighlight: function (chart, item) {  
  
    var recordData = item.record.data;  
  
    var storeData = [  
        {year: '2007', percent: recordData.y2007},  
        {year: '2008', percent: recordData.y2008},  
        {year: '2009', percent: recordData.y2009},  
        {year: '2010', percent: recordData.y2010},  
        {year: '2011', percent: recordData.y2011},  
        {year: '2012', percent: recordData.y2012}  
    ];  
  
    this.lookupReference('cartesian').getStore().setData(storeData);
```

2007-2012

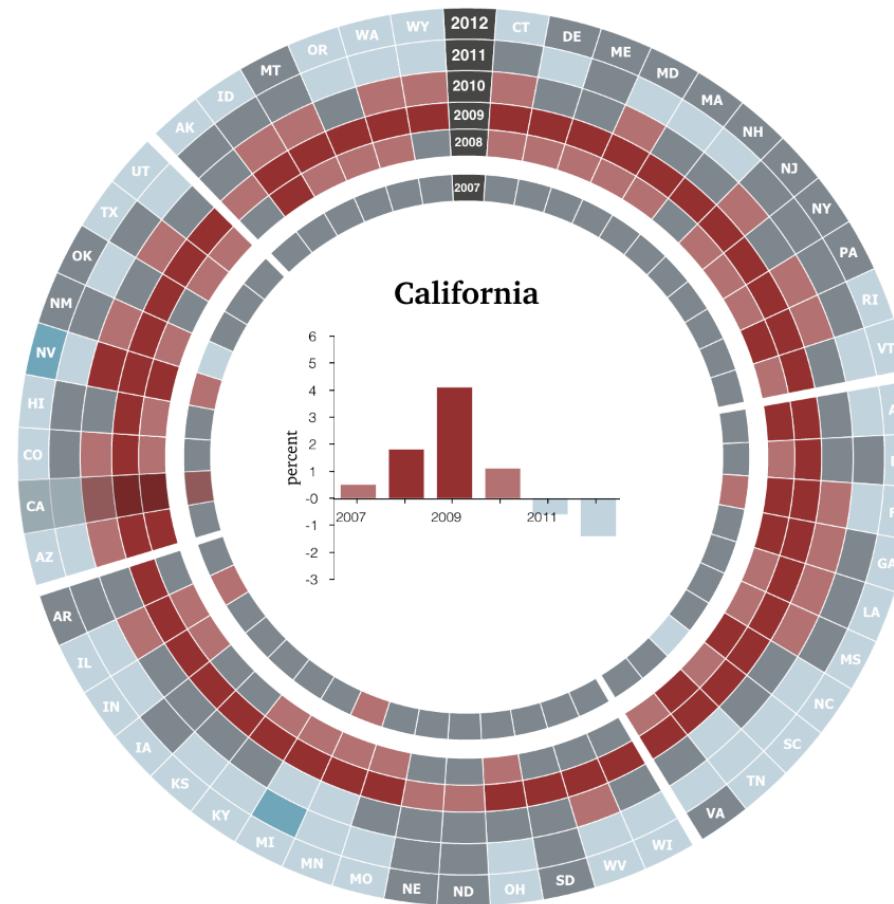
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Unemployment



Roll over a state to learn more.



Draw package

Main features

- ◆ Allows to create arbitrary graphics
- ◆ Renderer agnostic
- ◆ Sprite based

Ext.draw.Container

Ext.draw.Surface

Ext.draw.Surface

Ext.draw.Surface

Sprite

Sprite

Sprite

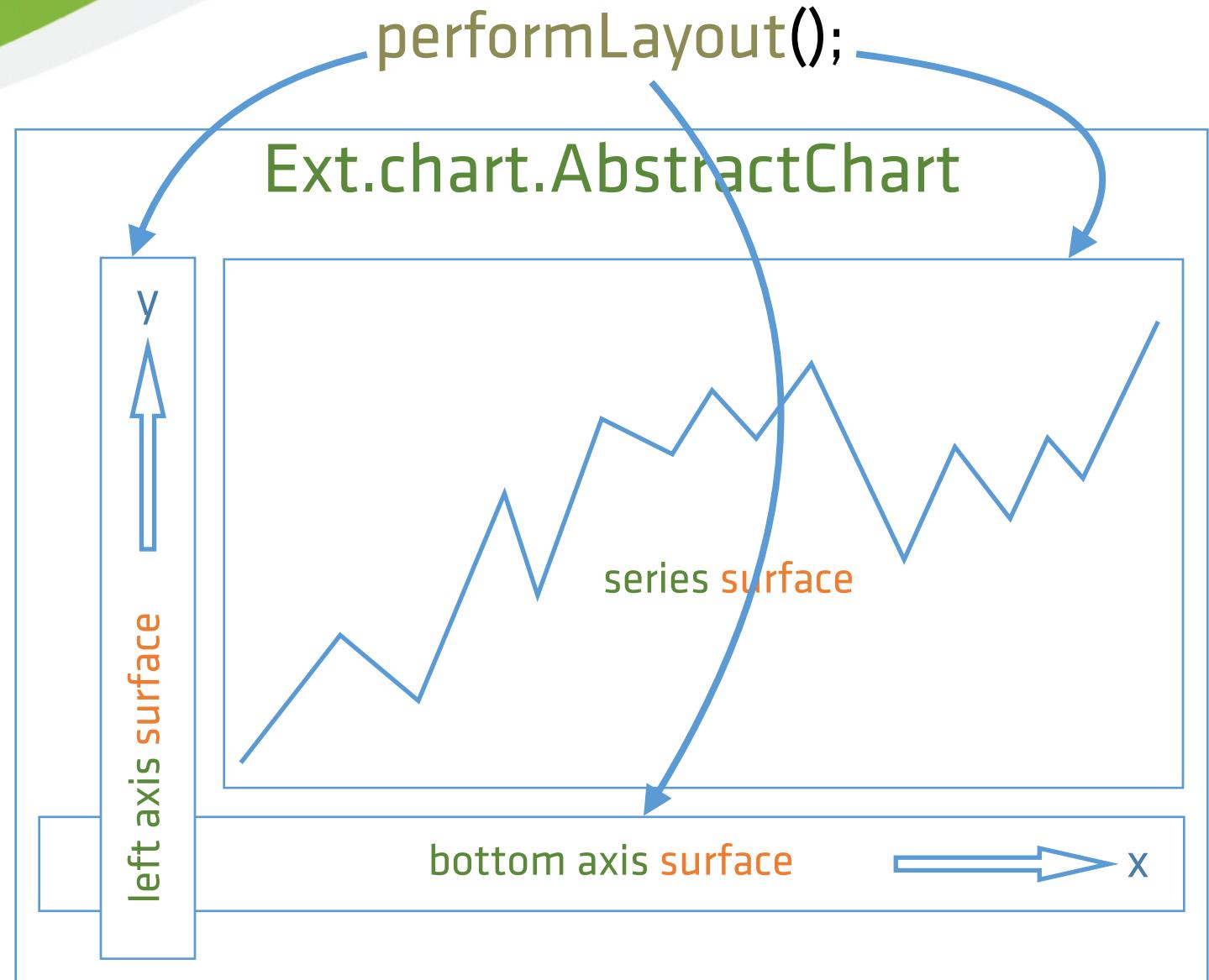
Surface management

Ext.draw.Container

```
config: {  
    resizeHandler: null  
}
```

```
defaultResizeHandler: function (size) {  
    this.getItems().each(function (surface) {  
        surface.setRect([0, 0, size.width, size.height]);  
    });  
}
```

drawContainer.renderFrame();



Surface creation

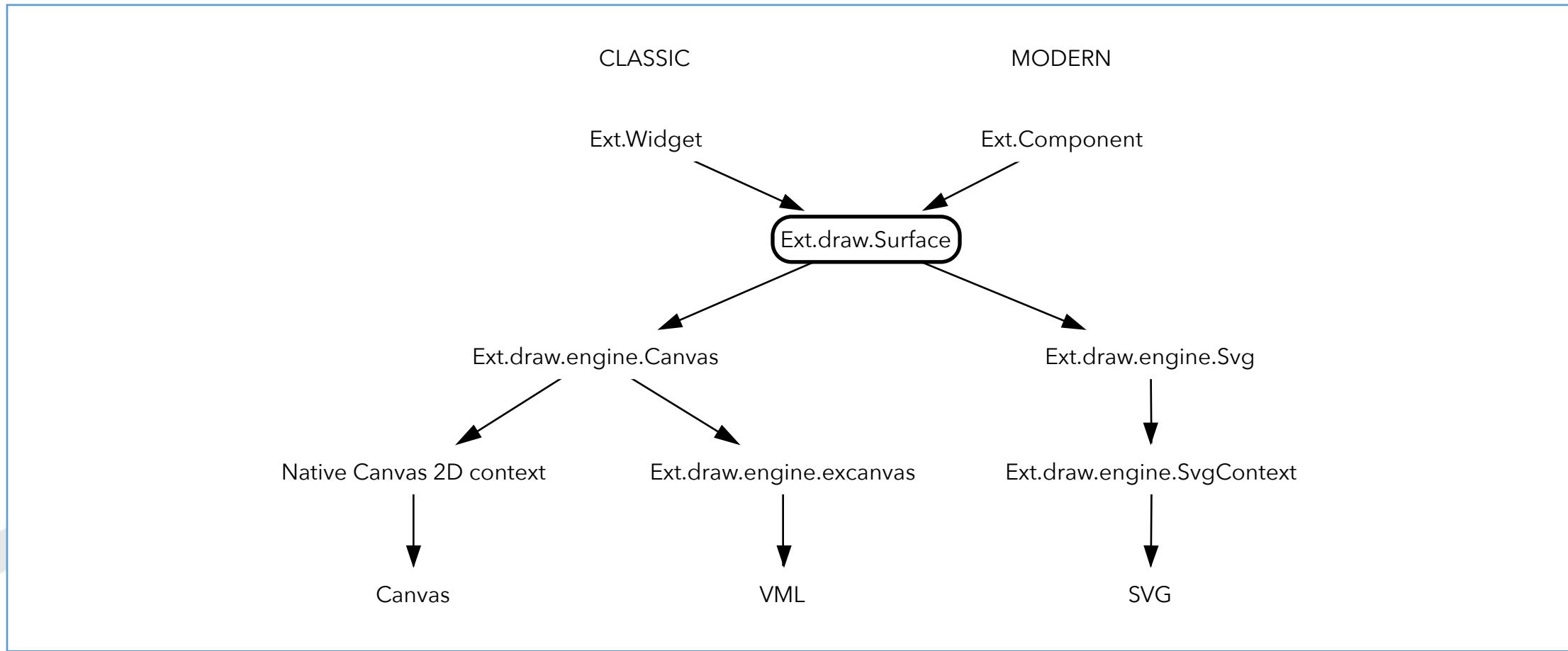
```
drawContainer.getSurface(id);
```

Engines

```
engine: 'Ext.draw.engine.Canvas'
```

```
engine: 'Ext.draw.engine.SVG'
```

Draw Surface



Surface methods

```
add(config/sprite);  
remove(sprite/id);  
get(id);  
clear();
```

```
surface.renderFrame();  
surface.renderSprite(sprite);  
sprite.render(ctx);
```

Performant

Flexible

Extensible

Mobile / Touch

Cross-toolkit

General Purpose

Renderer Agnostic

Bi-directional

Themeable

Thank you!

Twitter: @vitalyx

Example code: <https://github.com/yay/SenchaCon2015>

Credits: <http://goo.gl/5ywnz0>