A Developer Diary

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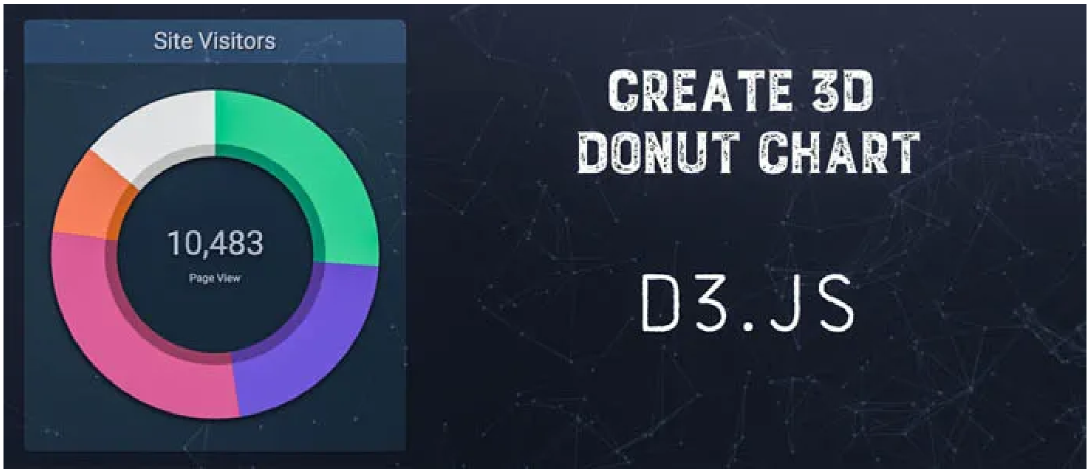
January 9, 2016 By Abhisek Jana — Leave a Comment (Edit)

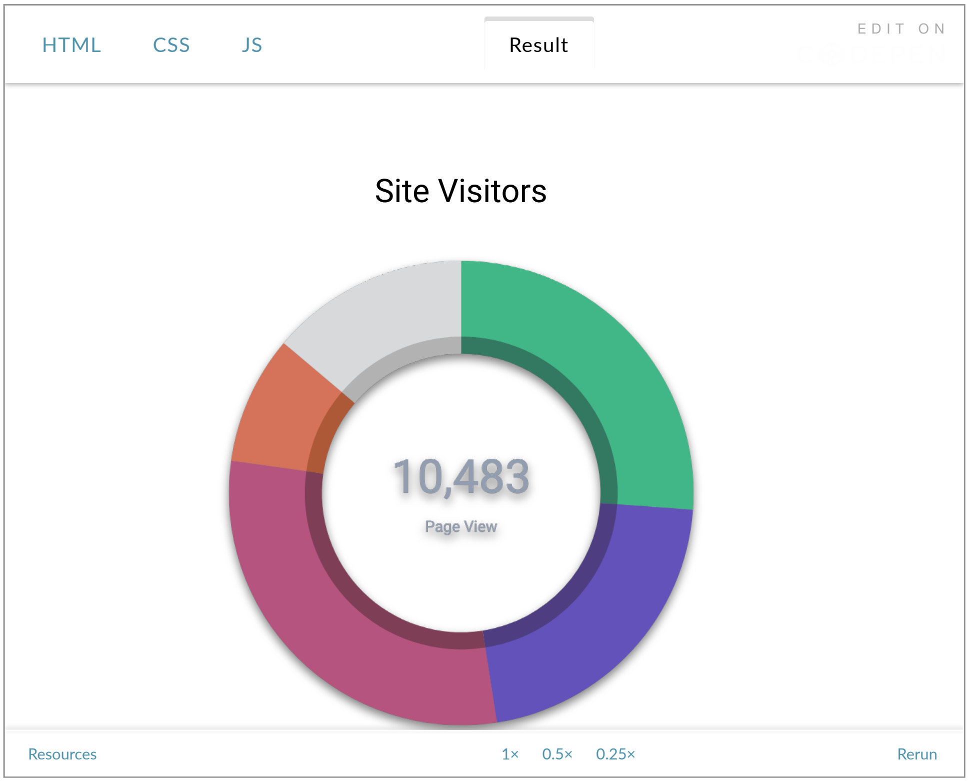
Create 3D Donut Chart using D3.js



We will learn how to Create 3D Donut Chart using D3.js in this tutorial. We will use simple color function to add the perspective of third dimention. This chart looks great and can be used in any application.

Please refer my previous article Create a simple Donut Chart using D3.js where we have created a basic donut chart using animation and legends.We will use the same concept here.

Before we get started lets review the chart we will be creating today. Please click on `Run Pen` to see the demo.



If you notice carefully, we are actually creating two donut charts instead of one. The inner chart color has been chosen such a way it will look like a shadow, which provides a 3D prespective. We will use some of the built-in D3.js function to determine the color of the second donut chart based on the first donut chart.Now lets go through the step by step process.

We will build this chart using the following dataset.

```
var dataset = [
        { name: 'Direct', count: 2742 },
        { name: 'Facebook', count: 2242 },
        { name: 'Pinterest', count: 3112 },
        { name: 'Search', count: 937 },
        { name: 'Others', count: 1450 }
    ];
```

The following code is very easy to understand. We will be using a custom color scale, however you can use any colors or the built in color values.

```
var pie=d3.layout.pie()
            .value(function(d){return d.count})
            .sort(null);

var w=300,h=300;

var outerRadiusArc=w/2;
var innerRadiusArc=100;
var shadowWidth=10;

var outerRadiusArcShadow=innerRadiusArc+1;
var innerRadiusArcShadow=innerRadiusArc-shadowWidth;

var color = d3.scale.ordinal()
        .range(['#41B787', '#6352B9', '#B65480', '#D5735A', '#D7D9DA']);

//Create the svg and a group inside it.

var svg=d3.select("#chart")
        .append("svg")
    .attr({
        width:w,
        height:h,
        class:'shadow'
        }).append('g')
    .attr({
        transform:'translate('+w/2+','+h/2+')'
    });
```

Since we need to create two charts its good idea to create a function and call it twice. Here is the `createChart()` function. The function takes the svg (which is basically the group element), outer & inner radius, a `fillFunction` (We will look into this soon) and `className`. We will use the `attrTween()` function to animate the chart.

```
var createChart=function(svg,outerRadius,innerRadius,fillFunction,className){

  var arc=d3.svg.arc()
          .innerRadius(outerRadius)
          .outerRadius(innerRadius);

  var path=svg.selectAll('.'+className)
          .data(pie(dataset))
          .enter()
          .append('path')
          .attr({
              class:className,
              d:arc,
              fill:fillFunction
          });

  path.transition()
          .duration(1000)
          .attrTween('d', function(d) {
              var interpolate = d3.interpolate({startAngle: 0, endAngle: 0},
d);
              return function(t) {
                  return arc(interpolate(t));
              };
          });

  var chart={path:path,arc:arc};
  return chart;
};
```

Now lets create the main chart using the following code. Notice the `fillFunction` which we are creating here. We are just iterating through the color list and send the appropriate color. This is default for any d3 chart.Nothing new or unusual here.

```
var mainChart=createChart(svg,outerRadiusArc,innerRadiusArc,function(d,i){
        return color(d.data.name);
    },'path1');
```

While creating the shadow (inner donut chart) instead of returing the `color(d.data.name)` in the `fillFunction` we are using `d3.hsl()` function to change the color to its shaow values.

At first we are converting the color value from `hex` to `hsl` and storing that in a variable named `c`. Then creating a new color value by changing the Hue, Saturation and lightness.

```
var
shadowChart=createChart(svg,outerRadiusArcShadow,innerRadiusArcShadow,function(d,i)
{
        var c=d3.hsl(color(d.data.name));
        return d3.hsl((c.h+5), (c.s -.07), (c.l -.15));
    },'path2');
```

We also have added some text to display the total once the chart has been created. Here is the full code.

```
Site Visitors
```

```
var dataset = [
    { name: 'Direct', count: 2742 },
    { name: 'Facebook', count: 2242 },
    { name: 'Pinterest', count: 3112 },
    { name: 'Search', count: 937 },
    { name: 'Others', count: 1450 }
];

var total=0;

dataset.forEach(function(d){
    total+= d.count;
});

var pie=d3.layout.pie()
        .value(function(d){return d.count})
        .sort(null);

var w=300,h=300;

var outerRadiusArc=w/2;
var innerRadiusArc=100;
var shadowWidth=10;

var outerRadiusArcShadow=innerRadiusArc+1;
var innerRadiusArcShadow=innerRadiusArc-shadowWidth;

var color = d3.scale.ordinal()
 .range(['#41B787', '#6352B9', '#B65480', '#D5735A', '#D7D9DA']);

var svg=d3.select("#chart")
```

```
        .append("svg")
        .attr({
            width:w,
            height:h,
            class:'shadow'
        }).append('g')
        .attr({
            transform:'translate('+w/2+','+h/2+')'
        });


var createChart=function(svg,outerRadius,innerRadius,fillFunction,className){

    var arc=d3.svg.arc()
            .innerRadius(outerRadius)
            .outerRadius(innerRadius);

    var path=svg.selectAll('.'+className)
            .data(pie(dataset))
            .enter()
            .append('path')
            .attr({
                class:className,
                d:arc,
                fill:fillFunction
            });

    path.transition()
            .duration(1000)
            .attrTween('d', function(d) {
                var interpolate = d3.interpolate({startAngle: 0, endAngle:
0}, d);
                return function(t) {
                    return arc(interpolate(t));
                };
            });

    var chart={path:path,arc:arc};

    return chart;
};

var mainChart=createChart(svg,outerRadiusArc,innerRadiusArc,function(d,i){
    return color(d.data.name);
},'path1');

var
shadowChart=createChart(svg,outerRadiusArcShadow,innerRadiusArcShadow,function(d,i)
{
    var c=d3.hsl(color(d.data.name));
    return d3.hsl((c.h+5), (c.s -.07), (c.l -.15));
},'path2');



//Add text

function numberWithCommas(x) {
    return x.toString().replace(/\B(?=(\d{3})+(?!\d))/g, ",");
}

var addText= function (text,y,size) {
    svg.append('text')
            .text(text)
            .attr({
                'text-anchor':'middle',
                y:y
            })
            .style({
                fill:'#929DAF',
                'font-size':size
            });
};

var restOfTheData=function(){

    addText(function(){
        return numberWithCommas(total);
    },0,'30px');



    addText(function(){
        return "Page View";
    },25,'10px');

};
```

```
setTimeout(restOfTheData,1000);
```

```
body {
    background-color: #1B1F2A;
    width: 100%;
    font-family: 'Roboto', sans-serif;
    height: 100%;
}

.widget {
    margin: 0 auto;
    width:350px;
    margin-top:50px;
    background-color: #222D3A;
    border-radius: 5px;
    box-shadow: 0px 0px 1px 0px #06060d;

}

.header{
    background-color: #29384D;
    height:40px;
    color:#929DAF;
    text-align: center;
    line-height: 40px;
    border-top-left-radius: 7px;
    border-top-right-radius: 7px;
    font-weight: 400;
    font-size: 1.5em;
    text-shadow: 1px 1px #06060d;
}

.chart-container{
    padding:25px;
}

.shadow {
    -webkit-filter: drop-shadow( 0px 3px 3px rgba(0,0,0,.5) );
    filter: drop-shadow( 0px 3px 3px rgba(0,0,0,.5) );
}
```

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