CSc 337

LECTURE 18: CANVAS

Canvas

HTML 5 tag
- creates a canvas that you can draw on
  - similar to `DrawingPanel` in CSC 110
- Flexible, powerful, useful but may not be fully implemented by all browsers

```
<canvas width="100" height="100"></canvas>
```

Canvas

To access your canvas:

```
var canvas = document.getElementById(id);

var ctx = canvas.getContext("2d");
```

The context is like a pen. You can use it to draw on your canvas.

Drawing Shapes

Setting colors:

```
ctx.fillStyle = colorString;
ctx.strokeStyle = colorString;
```

Rectangle

```
ctx.fillRect(x, y, width, height);
```

Circle

```
ctx.beginPath();
ctx.arc(x, y, radius, startAngle, endAngle);
ctx.stroke();
```
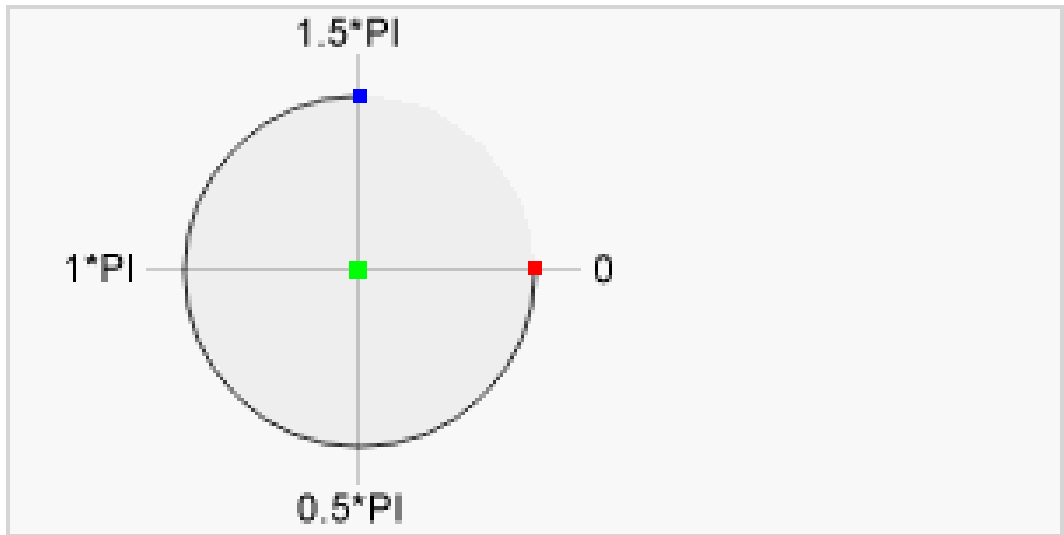
Line

```
ctx.moveTo(startX, startY);
ctx.lineTo(endX, endY);
ctx.stroke();
```

Drawing Circles

```
var c = document.getElementById("myCanvas");
var ctx = c.getContext("2d");
ctx.beginPath();
ctx.arc(100, 75, 50, 0, 2 * Math.PI);
ctx.stroke();
```

Animation

`setInterval`
◦ This works fine but it is not as good

`window.requestAnimationFrame(`**`function`**`)`
◦ better because it only draws when the browser wants to draw

```
function update() {

    var canvas = document.getElementById("myCanvas");
    var ctx = canvas.getContext("2d");
    draw stuff
    window.requestAnimationFrame(update);
}
```

Activity

Write code to draw a circle on a canvas and make it move downward by one pixel every half second until it hits the bottom of the canvas. Once it hits the bottom make it move up by one pixel until it hits the top.

Other Canvas Context Methods

Full list: https://www.w3schools.com/tags/ref_canvas.asp

`moveTo(x, y)`	Moves the path to the specified point in the canvas, without creating a line
`lineTo(x, y)`	Adds a new point and creates a line to that point from the last specified point in the canvas

Activity: Drawing Program

Create a web page that allows the user to draw with the mouse on a canvas.