Drawing shadows

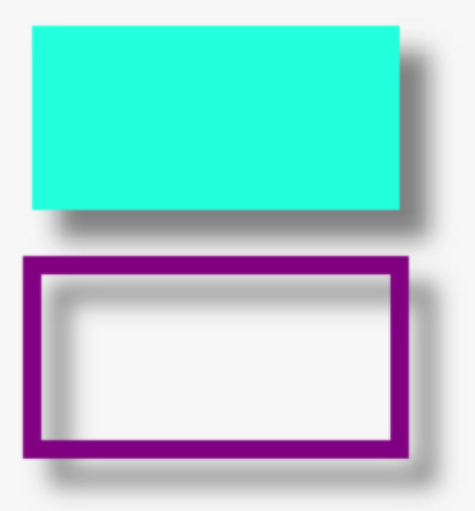
CONTEXT PROPERTIES TO DRAW WITH SHADOWS

There are 4 properties of the canvas context that are useful for indicating that we want to draw shapes with shadows:

1. `shadowColor`: color to use for shadows,
2. `shadowBlur`: blur level for shadows,
3. `shadowOffsetX`: horizontal distance of the shadow from the shape,
4. `shadowOffsetY`: vertical distance of the shadow from the shape

EXAMPLE 1: SIMPLE

Online example: http://jsbin.com/wivubi/3/edit



HTML source code:

```
<!DOCTYPE html>
```

```
<html>
<body onload = init();>
   <canvas id="myCanvas" width="400" height =800>
      Your browser does not support the canvas tag.
</canvas>
</body>
</html>
```

JavaScript source code:

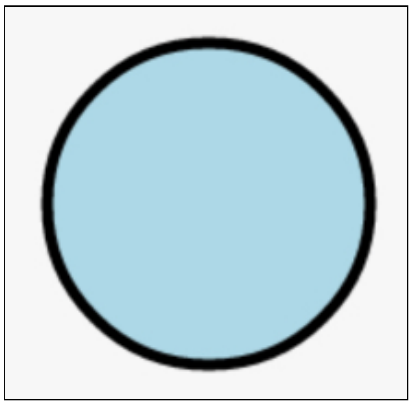
```
var canvas, ctx;
function init() {
   canvas = document.getElementById('myCanvas');
   ctx = canvas.getContext('2d');
   // call to a function that will set the 4 context properties for shadows
   setShadow();
   // all drawings that will occur will cast shadows
   // first green filled rectangle
12.  ctx.fillStyle = "#22FFDD";
   ctx.fillRect(20, 20, 200, 100);
   // second stroked rectangle
   ctx.strokeStyle = "purple";
   ctx.lineWidth=10;
   ctx.strokeRect(20, 150, 200, 100);
}

21. // We define the 4 properties in a dedicated function, for clarity
22. function setShadow() {
   ctx.shadowColor = "Grey";    // color
   ctx.shadowBlur = 20;        // blur level
   ctx.shadowOffsetX = 15;      // horizontal offset
   ctx.shadowOffsetY = 15;      // vertical offset
}
```

- *Lines 21-27*: we set the 4 properties that define shadows in a dedicated function, for a better clarity.
- Line 8: we called this function once before drawing the rectangles.
- *Lines 11-18*: we draw a filled and a stroked rectangle. Both rectangles cast shadows.

EXAMPLE 2: UNWANTED SHADOWS!

Let's take a previous example: the one that draws a filled circle with an outline: http://jsbin.com/gazuba/2/edit



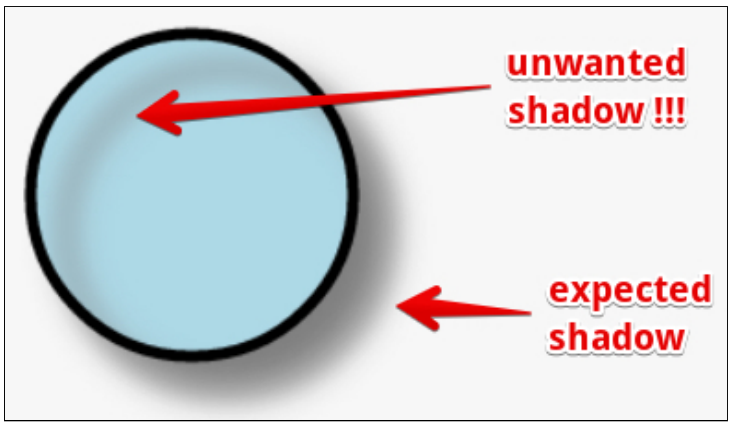
Now, let's add a shadow to it, online example: http://jsbin.com/gokemu/1/edit

Here is an extract from the code:

```
    ...
    ctx.beginPath();
    // Add to the path a full circle (from 0 to 2PI)
    ctx.arc(centerX, centerY, radius, 0, 2*Math.PI, false);
    // With path drawing you can change the context
    // properties until a call to stroke() or fill() is performed
    ctx.fillStyle = "lightBlue";
10.
    // add shadows before drawing the filled circle
    addShadows();
    // Draws the filled circle in light blue
    ctx.fill();
    // Prepare for the outline
    ctx.lineWidth = 5;
    ctx.strokeStyle = "black";
20.
    // draws AGAIN the path (the circle), this
    // time in wireframe
    ctx.stroke();
    // Notice we called context.arc() only once ! And drew it twice
    // with different styles
    ...
```

```
function addShadows() {
  ctx.shadowColor = "Grey"; // color
  ctx.shadowBlur = 20;      // blur level
  ctx.shadowOffsetX = 15;   // horizontal offset
  ctx.shadowOffsetY = 15;   // vertical offset
}
```

And here is the result:



Ah, indeed, the call to `ctx.fill()` casts a shadow, but the call to `ctx.stroke()`, that paints the whole path again, casts a shadow too, and this time the outline produces an unwanted shadow... How can we avoid this effect, while using the same technique for drawing the path?

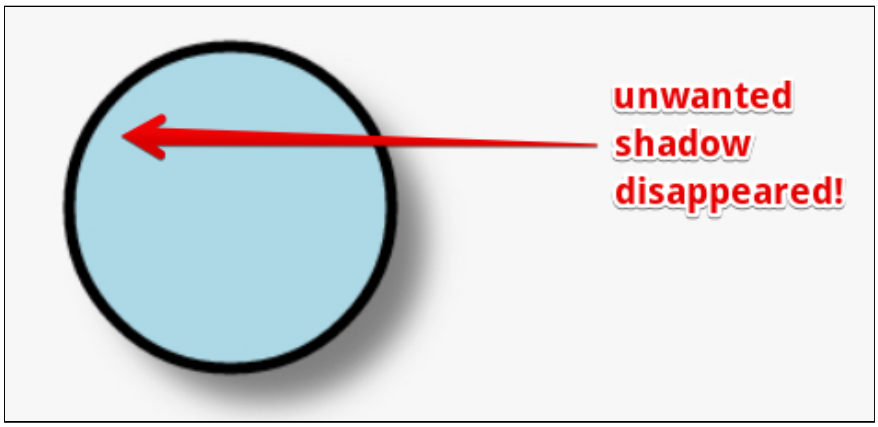
The trick consists in saving the context before setting the shadow properties, then draw the filled circle, then restore the context (to its previous state: without shadows), then draw the outlined circle by calling `ctx.stroke()`.

Correct version of the code: http://jsbin.com/kedobi/2/edit

```
...
// save the context before setting shadows and drawing the filled circle
ctx.save();
// With path drawing you can change the context
// properties until a call to stroke() or fill() is performed
ctx.fillStyle = "lightBlue";
// add shadows before drawing the filled circle
addShadows();
// Draws the filled circle in light blue
ctx.fill();
// restore the context to its previous saved state
```

```
ctx.restore();
...
```

And here is the final result:



KNOWLEDGE CHECK 3.5.6

Shadows are set using the `strokeStyle` ot `fillStyle` property of the context?

- Yes
- No