Intro to drawing

The <canvas> tag

The area enclosed by the <canvas> tags can be used for drawing and animation

<canvas> </canvas>

Attributes

- <canvas id="myCanvas" width="600" height="400"> </canvas>

- Before the canvas can be used for drawing and animation, it must have an ID, width, and height assigned to it.

- These may appear in the HTML, or they may be created with JavaScript/jQuery.

Default content

In Web browsers that do not support HTML5 , the canvas will not appear.

```
<canvas id="myCanvas" width="600"
height="400">
<p>Some default content can appear
here.</p> </canvas>
```

This is all you'll see in the HTML document.
Everything else will need JavaScript

The <*canvas*> element reference

The <*canvas*> element exposes an abundance of functionality through its canvas context, which is accessible using JavaScript. This element provides the following members.

- **height** Property that sets or gets the height of the canvas
- **width** Property that sets or gets the width of the canvas
- **getContext()** Method that accepts a parameter of 2d and returns a CanvasRenderingContext2D object that represents the canvas context
- **toDataUrl()** Method that creates a URL that can be used with an element that requires an image URL, such as the <*img*> element

- **addColorStop()** Method to set the colors and stop positions in a gradient object
- **arc()** Method to create an arc/curve
- **arcTo()** Method to create an arc/curve between two tangents
- **beginPath()** Method to start a path or reset the current path
- **bezierCurveTo()** Method to create a cubic Bézier curve
- **clearRect()** Method to clear a given rectangle
- **clip()** Method to clip a region of any shape and size from the original canvas
- **closePath()** Method to create a path from the current point back to the starting point
- **createImageData()** Method to create a new, blank ImageData object
- **createLinearGradient()** Method to create a linear gradient
- **createPattern()** Method to repeat a specified element in a specified direction
- **createRadialGradient()** Method to create a radial/circular gradient
- **data** Property that gets an ImageData object that contains the image data
- **drawImage()** Method to draw an image, canvas, or video onto the canvas
- **fill()** Method to fill the drawing path
- **fillRect()** Method to draw a filled rectangle
- **fillStyle** Property that sets or gets the color, gradient, or pattern used to fill the drawing
- **fillText()** Method to draw filled text on the canvas
- **font** Property that sets or gets the font properties for text content
- **getImageData()** Method to get an ImageData object that copies the pixel data for the specified rectangle on a canvas
- **globalAlpha** Property that sets or gets the current alpha or transparency value of the drawing
- **globalCompositeOperation** Property that sets or gets how a new image is drawn onto an existing image
- **isPointInPath()** Method that returns true if the specified point is in the current path
- **lineCap** Property that sets or gets the style of the end caps for a line
- **lineJoin** Property that sets or gets the type of corner to create when two lines meet
- **lineTo()** Method that adds a new point and creates a line from that point to the last specified point in the canvas
- **lineWidth** Property that sets or gets the current line width
- **measureText()** Method that gets an object that contains the width of the specified text
- **miterLimit** Property that sets or gets the maximum miter length

- **moveTo()** Method that moves the path to the specified point in the canvas without creating a line
- **putImageData()** Method that puts the image data from a specified ImageData object back onto the canvas
- **quadraticCurveTo()** Method that creates a quadratic Bézier curve
- **rect()** Method that creates a rectangle
- **restore()** Method that pops the previously saved context state from the stack
- **rotate()** Method that rotates the current drawing
- **save()** Method that pushes the state of the current context onto a stack
- **scale()** Method that scales the current drawing bigger or smaller
- **setTransform()** Method that resets the current transform to the identity matrix and then calls the transform() method
- **shadowBlur** Property that sets or gets the blur level setting to use for shadows
- **shadowColor** Property that sets or gets the color setting to use for shadows
- **shadowOffsetX** Property that sets or gets the horizontal distance setting of the shadow from the shape
- **shadowOffsetY** Property that sets or gets the vertical distance setting of the shadow from the shape
- **stroke()** Method to draw the path you have defined
- **strokeRect()** Method to draw a rectangle without fill
- **strokeStyle** Property that sets or gets the color, gradient, or pattern used for strokes
- **strokeText()** Method that draws text on the canvas without fill
- **textAlign** Property that sets or gets the alignment setting for text content
- **textBaseline** Property that sets or gets the text baseline setting used when drawing text
- **transform()** Method that replaces the transformation matrix setting for the drawing
- **translate()** Method that remaps the (0, 0) position on the canvas

Implementing the canvas

```
$(document).ready(function () {
    drawSomething();
});

function drawSomething() {
    var canvas = document.getElementById('myCanvas');
    var ctx = canvas.getContext('2d');
    ctx.fillRect(10, 50, 100, 200);
}
```

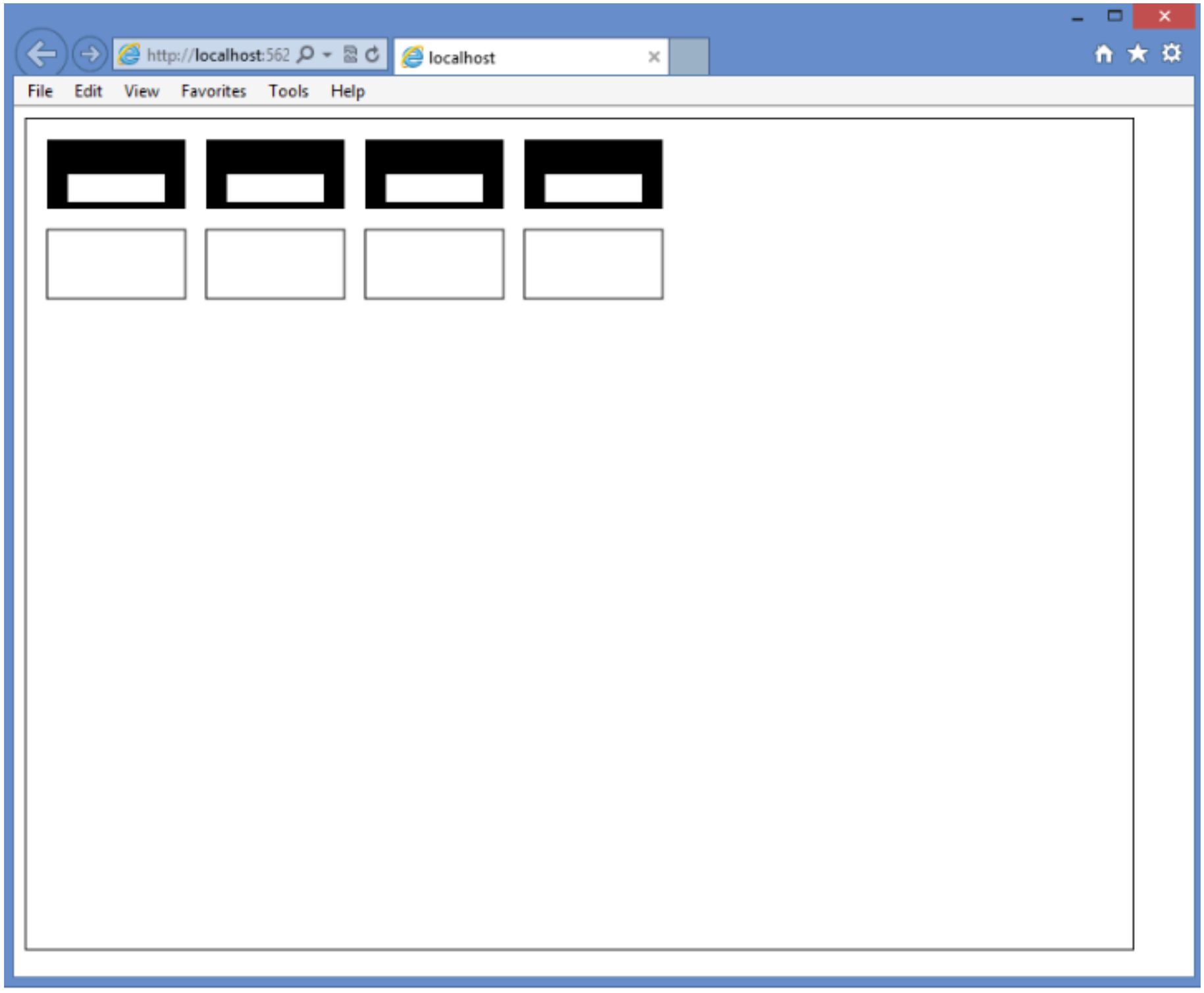
Drawing rectangles

The methods for creating rectangles accept four parameters. The first two parameters are the x and y locations of the upper-left corner of the rectangle. The last two parameters represent the width and height of the rectangle. You can create rectangles by using one of the following methods.

- **clearRect(x, y, w, h)** Clear the specified rectangular area.
- **fillRect(x, y, w, h)** Draw a filled rectangular area.
- **strokeRect(x, y, w, h)** Draw an unfilled rectangular area.

```
$(document).ready(function () {
 drawSomething();
 });
  function drawSomething() {
  var canvas = document.getElementById(‘myCanvas')
  , ctx = canvas.getContext(‘2d')
  , offset = 15
  , clearOffset = 30
  , pushDownOffset = 10
  , height = 50
  , width = 100
  , count = 4
  , i = 0;

for (i = 0; i < count; i++) {
    ctx.fillRect(i * (offset + width) + offset, offset, width,
       height); ctx.clearRect(i * (offset + width) +
       (clearOffset / 2) + offset, offset + (clearOffset / 2) +
       pushDownOffset, width - clearOffset, height -
       clearOffset) ctx.strokeRect(i * (offset + width) +
       offset, (2 * offset) + height, width, height);
       }
}
```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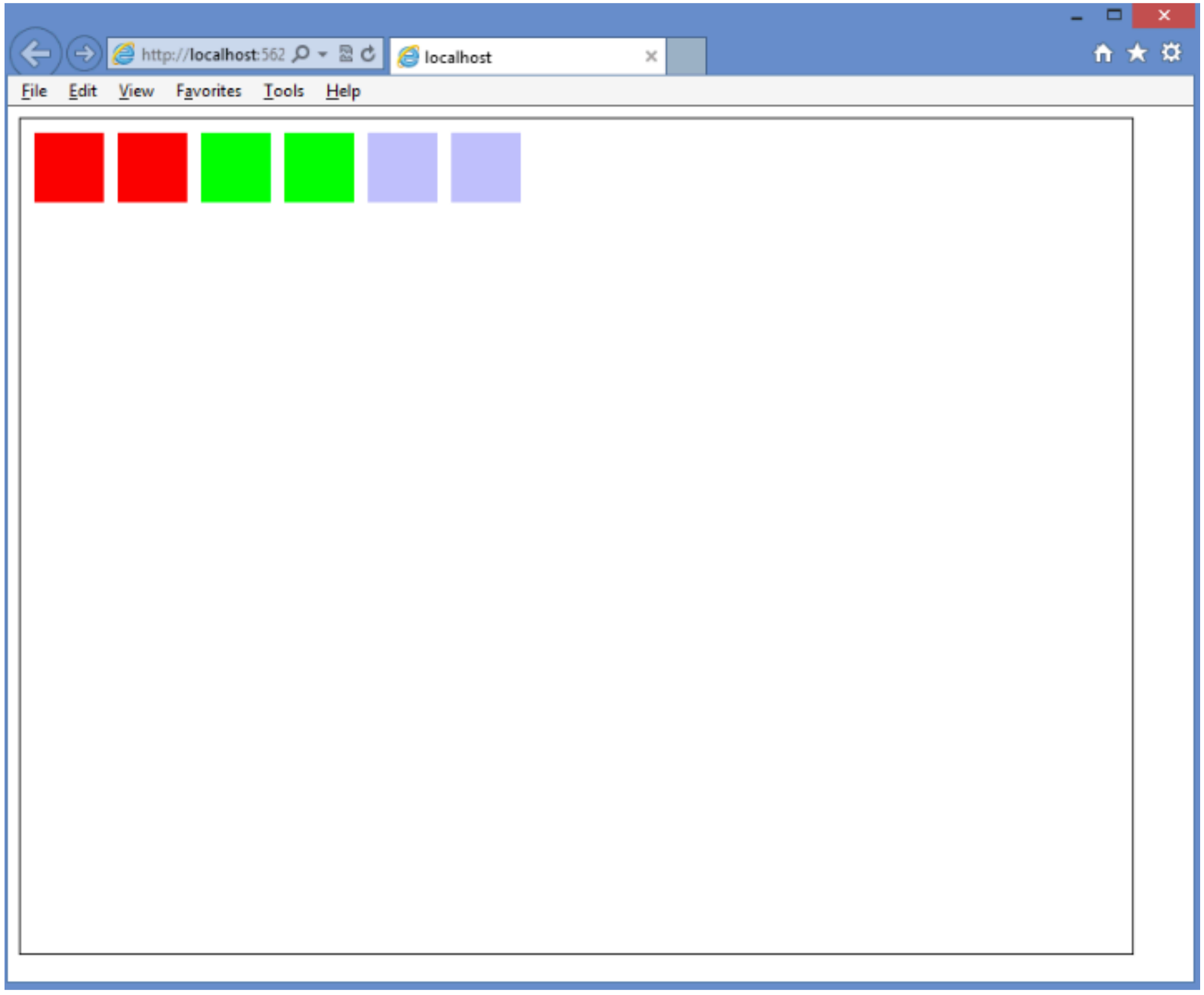
- **CSS color** Creates a solid color fill based on a valid CSS color value such as black, red, or #00FF00. The following is an example of setting fillStyle by using a *CSS color* value.

```
function drawUsingCssColor() {
    var canvas = document.getElementById('myCanvas')
        , ctx = canvas.getContext('2d')
        , offset = 10
        , size = 50;

    ctx.fillStyle = "red";
    ctx.fillRect(offset + (0 * (offset + size)), offset, size, size);
    ctx.fillRect(offset + (1 * (offset + size)), offset, size, size);

    ctx.fillStyle = "#00FF00";
    ctx.fillRect(offset + (2 * (offset + size)), offset, size, size);
    ctx.fillRect(offset + (3 * (offset + size)), offset, size, size);

    ctx.fillStyle = "rgba(0, 0, 255, 0.25)";
    ctx.fillRect(offset + (4 * (offset + size)), offset, size, size);
    ctx.fillRect(offset + (5 * (offset + size)), offset, size, size);
}
```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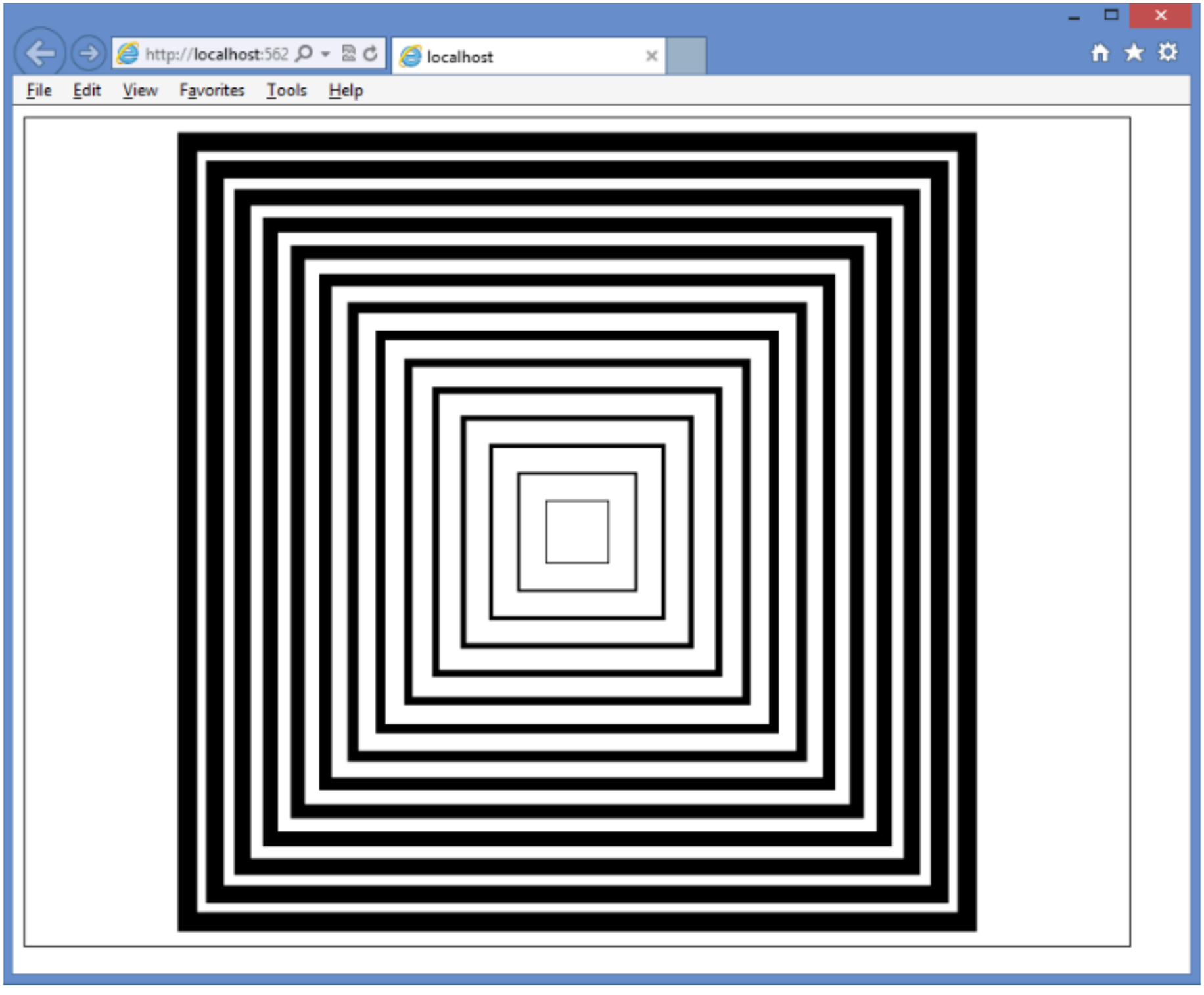
Setting lineWidth

The lineWidth property specifies the thickness of any line you draw. The following code example draws rectangles by using different lineWidth settings.

```
function drawLineWidth() {
    var canvas = document.getElementById('myCanvas')
        , ctx = canvas.getContext('2d')
        , offset = 40
        , width = 5
        , height = 5
        , lineWidth = 1
        , i = 0
        , centerX = canvas.width / 2
        , centerY = canvas.height / 2;

    for (i = 1; i < 15; i++) {
        ctx.lineWidth = i;
        ctx.strokeRect(centerX - (width / 2) - (i * offset / 2),
            centerY - (height / 2) - (i * offset / 2),
            width + (i * offset), height + (i * offset));
    }
}
```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