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# HTML CANVAS

# OUTLINE

- Overview of HTML Canvas
- Using the Canvas
- Examples

# HTML CANVAS

- An HTML element used to draw graphics in real-time
- HTML Canvas is the place where graphics can be drawn
- Graphics are drawn with JavaScript
- Supported in all major browsers

# APPLICATIONS

- Graphics
- Animations
- Data Visualizations
- Games

# SETTING UP THE CANVAS

- Use the <canvas> html tag
- Set properties:
  - id, width, height
  - Optionally, use style/css to add a border

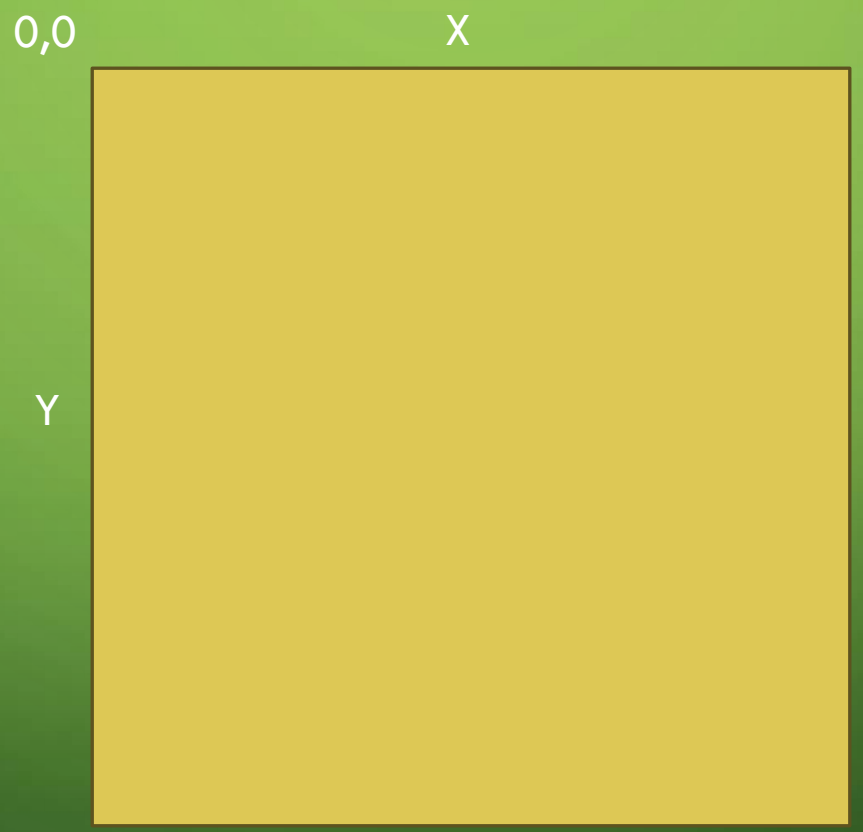
```
<canvas id="myCanvas" width="300"
height="300" style="border:1px solid
#000000"></canvas>
```

# CONFIGURING JAVASCRIPT

- JavaScript is used to draw on the Canvas
- Extract the graphics context from the Canvas
- All drawing commands go through the context

```
const canvas = document.getElementById("myCanvas");
const ctx = canvas.getContext("2d");
```

# COORDINATES



# DRAWING RECTANGLES

```
ctx.fillRect(50, 50, 150, 100);
ctx.strokeRect(250, 50, 150, 100);
ctx.clearRect(100, 75, 50, 50);
```

# DRAWING PATHS

```
ctx.beginPath();
ctx.moveTo(50, 200);
ctx.lineTo(200, 200);
ctx.lineTo(125, 300);
ctx.closePath();
ctx.stroke();
```

# DRAWING CIRCLES/ARCS

```
ctx.beginPath();
ctx.arc(300, 250, 50, 0, Math.PI * 2, false);
ctx.fill();
ctx.stroke();
```

# COLOUR AND STYLE

```
ctx.fillStyle = 'purple’;
ctx.strokeStyle = 'orange';
ctx.lineWidth = 5;
```

# GRADIENTS

```
const gradient = ctx.createLinearGradient(0, 0, 200, 0);
gradient.addColorStop(0, 'red');
gradient.addColorStop(1, 'yellow');
ctx.fillStyle = gradient;
ctx.fillRect(0,0, 100, 200);
ctx.fillRect(300, 350, 150, 75);
```

# TEXT

```
ctx.font = '30px Arial';
ctx.fillStyle = 'black';
ctx.fillText('Hello, Canvas!', 50, 400);
ctx.strokeStyle = 'blue';
ctx.strokeText('Hello, Canvas', 50, 450);
```

# IMAGES AND VIDEOS

```
const img = new Image();
img.src = 'circle.png';
img.onload = function() {
    ctx.drawImage(img, 300, 300, 150, 150);
};
```

# TRANSFORMATIONS

```
ctx.translate(300, 200);
ctx.rotate(Math.PI / 4);
ctx.fillStyle = 'red';
ctx.fillRect(0, 0, 100, 100);
ctx.resetTransform();
```

# ANIMATIONS

```
let x = 0;
function animate() {
    ctx.clearRect(0, 0, canvas.width, canvas.height);
    ctx.fillStyle = 'blue';
    ctx.fillRect(x, 50, 50, 50, 50);
    x += 2;
    if(x > canvas.width)
        x = 0;
    requestAnimationFrame(animate);
}
animate();
```

# NEXT CLASS

## ADVANCED JAVASCRIPT