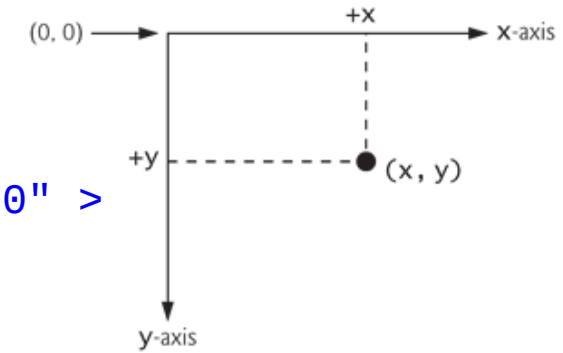
Univerza v Ljubljani
Fakulteta za računalništvo
in informatiko

HTML5 Canvas

Canvas

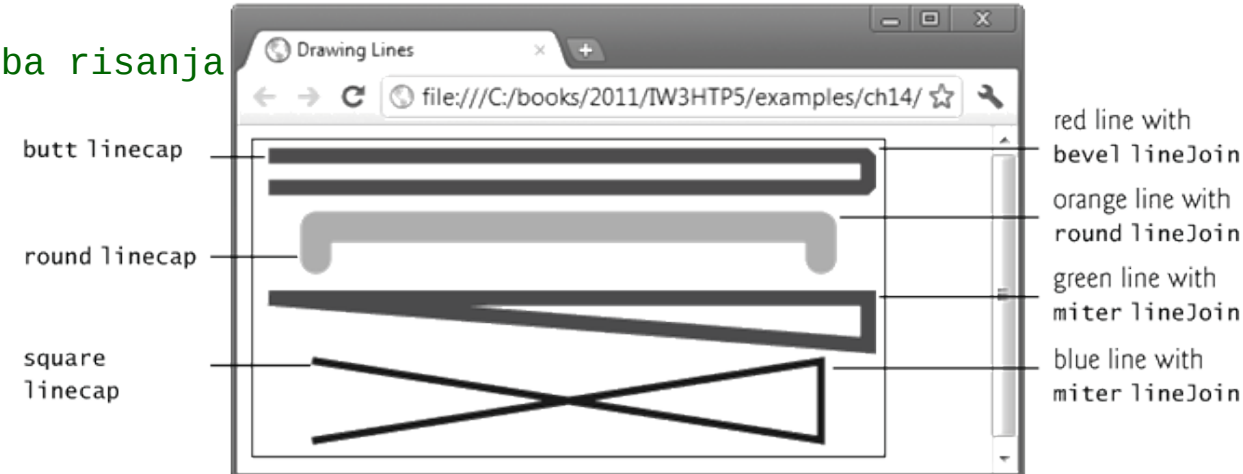
- element <canvas> predstavlja risalno površino
- 2D risalna površina (uporabnejša kot risanje v tabelo – prvi poskusi »on-line« risanja)
- možno upravljanje z uporabo skriptne kode, zagotavlja API za risanje
- starejši brskalniki imajo lahko probleme s prikazom ali delom
- podpira risanje v bitne slike (ne hrani objektov)
- novejši brskalniki omogočajo tudi uporabo vektorske grafike (SVG)
- omogoča vstavljanje multimedijskih vsebin
- vtičniki niso potrebni (Flash, Silverlight)

```
<canvas id = "canvasID" width = "300" height = "100" >
    Your browser does not support canvas.
</canvas>
```



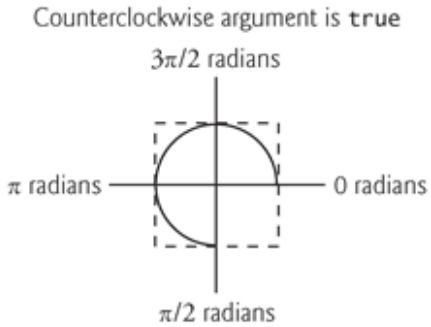
Risanje črt

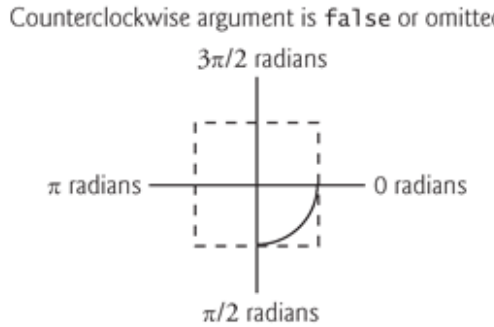
```
context.beginPath();          // začetek risanja
context.moveTo(10, 10);       // začetna točka
context.lineTo(390, 10);      // končna točka črte
context.lineWidth = 10;       // debelina
context.lineJoin = "bevel"    // tip vogala
context.lineCap = "butt";     // tip zaključka črte
context.strokeStyle = "red"   // barva črte
context.stroke();
            // izvedba risanja
```



Risanje lokov in krogov

- `context.arc(X , Y, radij, začetni kot, končni kot, [clockwise?]);`

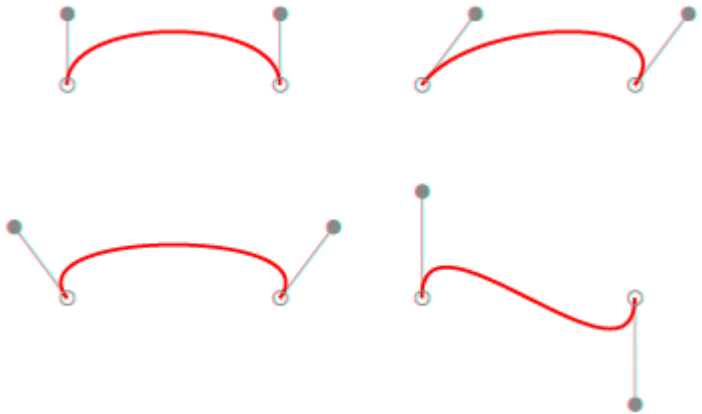


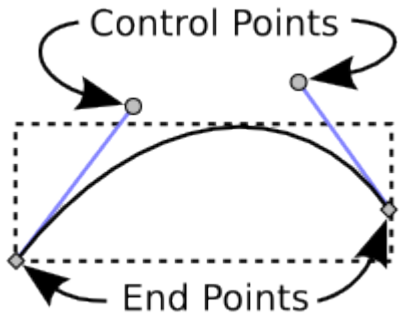



- ```
  context.arc(110, 50, 30, 0, Math.PI * 2, false);
  context.fillStyle = “mediumslateblue”;
  context.fill();
  ```
- ```
  context.arc(110, 50, 30, 0, Math.PI, false);
  context.stroke();
  ```

Risanje Bezierjevih krivulj

```
context.moveTo(5, 100);        // začetna točka

context.bezierCurveTo(12, 37, // 1. kontrolna točka
                      176, 77,    // 2. kontrolna točka
                      32, 133);   //    končna točka
```





Risanje senc in gradientov

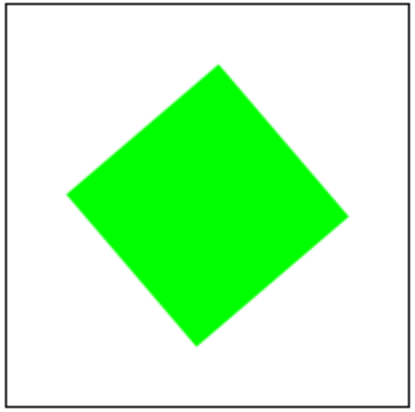
```
context.shadowBlur = 15;       // določa razpršenost sence
context.shadowOffsetX = -20;   // določa zamik sence v X osi
context.shadowOffsetY = -20;   // določa zamik sence v Y osi
context.shadowColor = “blue”

var gradient = context.createLinearGradient(startX, startY, endX, endY);
                    // kreiramo linearni preliv
gradient.addColorStop(0, “white”) // začetna barva preliva
gradient.addColorStop(0.5, “yellow”)   // vmesna barva preliva (na sredini)
gradient.addColorStop(1, “green”) // končna barva preliva
context.fillStyle = gradient; // določimo preliv kot način zapolnitve

var gradient = context.createRadialGradient
        (startX, startY, startRadius, endX, endY, endRadius);
                    // kreiramo krožni preliv
.....................
```

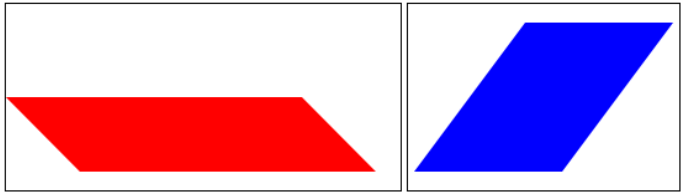
Grafika

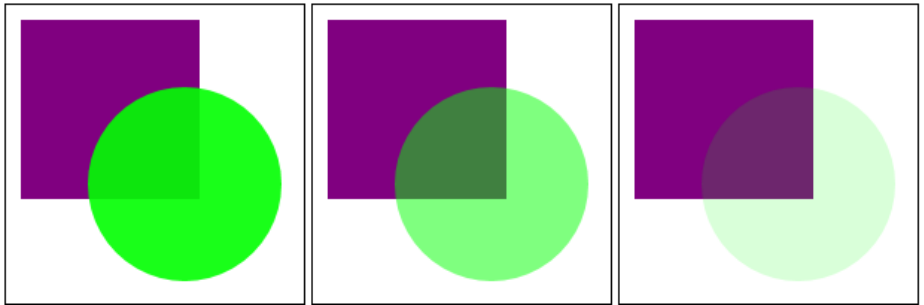
- vključevanje slik in ozadij
- transformacije:

```
translate(translationX, translationY)
scale(scaleX, scaleY)
rotate(angle)
transform(scaleX, skewY, skewX, scaleY, translationX, translationY)
```

- prikaz besedila







Canvas vs SVG: primer

```
<!DOCTYPE html>
  <html> <head>
  <title>HTML5 canvas primer</title>
  <meta charset="utf-8"/> </head>
  <body>
    <canvas id="myCanvas" width="300"
          height="200" style="border:1px solid #d3d3d3;">
      Your browser does not support the HTML5 canvas</canvas>
    <script>
      var c = document.getElementById("myCanvas");
      var ctx = c.getContext("2d");
      var scX=1.5, scY=1; ctx.scale(scX,scY);
      var grd = ctx.createRadialGradient
                  (100,100,5,100,100,100);
      grd.addColorStop(0,"red");
      grd.addColorStop(1,"white");
      ctx.fillStyle = grd; ctx.fillRect(0,0,300,200);
      ctx.scale(1/scX,1/scY);
      ctx.fillStyle= "black";
      ctx.font = "30px Arial";
      ctx.fillText("SPLETNE",100,95);
      ctx.fillText("TEHNOLOGIJE",60,125);
      ctx.stroke();
   </script> </body> </html>
```

SPLETNE
TEHNOLOGIJE

```
<!DOCTYPE html>
  <html> <head>
    <title>SVG primer</title>
    <meta charset="utf-8"/> </head>
<body>
  <svg height="130" width="500">
    <defs>
      <linearGradient id="grad1" x1="0%" y1="0%"
         x2="100%" y2="0%">
        <stop offset="0%" style=
         "stop-color:rgb(255,255,0);stop-opacity:0.5"/>
        <stop offset="100%" style=
         "stop-color:rgb(255,0,0);stop-opacity:1" />
      </linearGradient>
    </defs>
    <ellipse cx="100" cy="70" rx="85" ry="55"
                fill="url(#grad1)" />
    <text fill="#ffffff" font-size="18"
     font-family="Verdana" x="60" y="66">SPLETNE</text>
    <text fill="#ffffff" font-size="18"
     font-family="Verdana" x="22" y="86">TEHNOLOGIJE</text>
    Sorry, your browser does not support inline SVG.
  </svg>
</body> </html>
```

SPLETNE
TEHNOLOGIJE

Canvas

- še veliko več…
- HTML5 Canvas reference:
  - http://www.w3schools.com/tags/ref_canvas.asp
- Demo strani:
  - http://www.kevs3d.co.uk/dev/
  - http://www.hongkiat.com/blog/48-excellent-html5-demos/
  - https://developer.mozilla.org/en-US/demos/tag/tech%3Acanvas
  - https://davidwalsh.name/canvas-demos