Exploring HTML 5

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Geolocation

Get GPS coordinates

```
navigator.geolocation.getCurrentPosition(success);

function success(position) {
    const lat = position.coords.latitude;
    const long = position.coords.longitude;
}
```

… and use Google Maps:

https://developers.google.com/maps/documentation/javascript/examples/map-geolocation

Local Storage

Local Storage (≠ cookies)

- Store key/value pairs in the browser
- Accessible from the same domain only
- Up to 10mb (on Chrome)
- Persistent

Instructions

Push	`localStorage.setItem(`*`key`*`, `*`value`*`)`
Pull	`localStorage.getItem(`*`key`*`)`
Remove	`localStorage.removeItem(`*`key`*`)`

Drag'n Drop

Drag & Drop can be use for

Use for

- interacting with the DOM
- uploading a file

Drag n'Drop events

```
const holder = select_dom_element

holder.ondragstart = function(e){return false;};
holder.ondragend = function(e){return false;};
holder.ondragover = function(e){return false;};
holder.ondragenter = function(e){return false;};
holder.ondragleave = function(e){return false;};
holder.ondrop = function(e){return false;};
```

Canvas

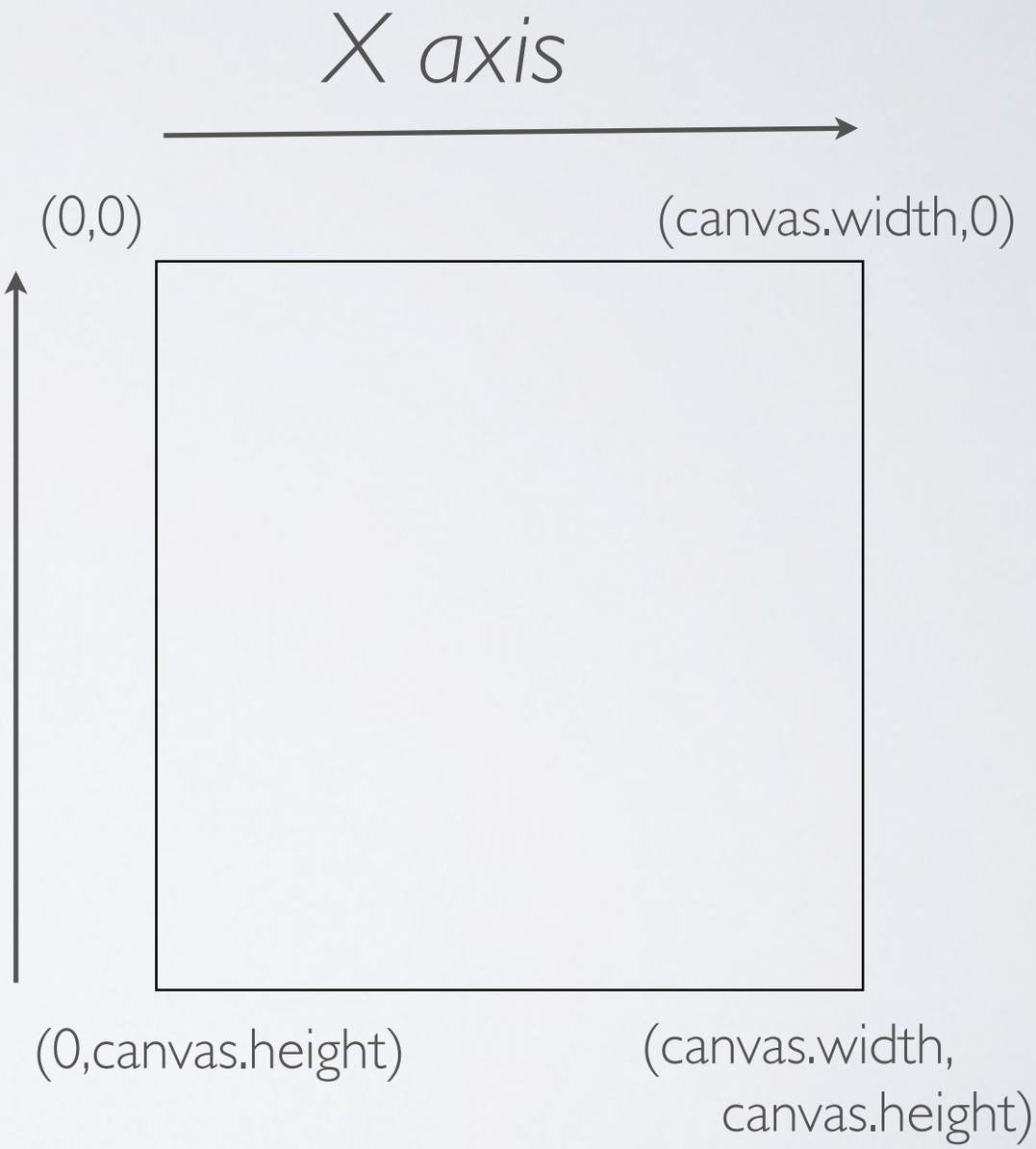
HTML - the **`canvas`** tag

```
<canvas></canvas>
```

Specific attributes:

- `Height`
- `Width`

These are **not** the styling attributes `CSS.height` and `CSS.width`



Javascript - the 2D context

The 2D context object is used for drawing

```
const canvas = $("#myCanvas")[0];
const context =
canvas.getContext("2d");
```

Drawing lines

```
context.moveTo(10, 10);
context.lineTo(50, 50);
context.lineWidth = 2;
context.strokeStyle = "#00FF00";
context.stroke();
```

start-point

end-point

line width

line color

line style

Curve lines: see *arcs*, *quadratic curves* and *Beziers curves*

Drawing shapes using the concept of *path*

```
context.beginPath(); // begin custom shape
context.moveTo(170, 80);
context.bezierCurveTo(130, 100, 130, 150, 230, 150);
context.bezierCurveTo(250, 180, 320, 180, 340, 150);
context.bezierCurveTo(420, 150, 420, 120, 390, 100);
context.bezierCurveTo(430, 40, 370, 30, 340, 50);
context.bezierCurveTo(320, 5, 250, 20, 250, 50);
context.bezierCurveTo(200, 5, 150, 20, 170, 80);
context.closePath(); // complete custom shape
context.lineWidth = 5;
context.fillStyle = "#8ED6FF";
context.fill();
context.strokeStyle = "#0000ff";
context.stroke();
```

example from *HTML5CanvasTutorial*
http://www.html5canvastutorials.com/tutorials/html5-canvas-shape-fill/

Predefined shapes

rectangle

```
context.rect(topLeftCornerX, topLeftCornerY, width, height);
```

semi-circle

```
context.arc(centerX, centerY, radius, 0, Math.PI, false);
```

circle

```
context.arc(centerX, centerY, radius, 0, 2 * Math.PI, false);
```

Drawing an existing image into a canvas

```
context.drawImage(imageObj, destX, destY, destWidth, destHeight);
```

Video

The `video` tag

```
<video src="movie.webm" poster="movie.jpg" controls="true">
        This is fallback content to display if the browser
        does not support the video element.
</video>
```

Specific attributes:

- `audio`
- `autoplay`
- `controls`
- `height`
- `width`
- `loop`
- `poster`
- `preload`
- `src`

see *http://www.w3schools.com/html5/tag_video.asp*

Different video formats (yet)

- Several formats = Several videos in your web application

```
<video poster="movie.jpg" controls>
 <source src='movie.webm' type='video/webm; codecs="vp8.0, vorbis"'/>
 <source src='movie.ogv' type='video/ogg; codecs="theora, vorbis"'/>
 <source src='movie.mp4' type='video/mp4; codecs="avc1.4D401E,
mp4a.40.2"'/>
  <p>This is fallback content</p>
</video>
```

see browser support: https://en.wikipedia.org/wiki/HTML5_video#Browser_support

Mixing video and canvas

Exactly the same as drawing an image!

```
context.drawImage(videoObj, destX, destY, destWidth, destHeight);
```

Getting and setting a video frame using canvas

Get the current image frame

```
const frame = myCanvasCtx.getImageData(0, 0, width, height);
```

- Set the current image frame

```
myCanvasCtx.putImageData(frame, 0, 0);
```

see *http://www.phpied.com/pixel-manipulation-in-canvas/*

Manipulating the frame object

A frame = a matrix of pixels components

Pixel components = red green blue alpha

```
Red   = frame [(row * 4 * width) + (column * 4)];
Green = frame [(row * 4 * width) + (column * 4) + 1];
Blue  = frame [(row * 4 * width) + (column * 4) + 2];
Alpha = frame [(row * 4 * width) + (column * 4) + 3];
```

Example - The Green Screen Effect

How to you change the background of a video dynamically?
like in *https://dl.dropboxusercontent.com/u/26942820/CDN/CKVideo/index.html*

see *http://tech.pro/tutorial/1281/chroma-key-video-effects-using-javascript-and-the-html5-canvas-element*

Speech

Speech2Text - setup

```
const recognition = new webkitSpeechRecognition();

recognition.continuous = true;
recognition.interimResults = true;
recognition.lang = ‘en-us';

recognition.onresult = function (e) {
    for (let i = e.resultIndex; i < e.results.length; ++i){
                console.log(e.results[i][0].transcript);
    }
};
```

Speech2Text - control

Start	`recognition.start();`
Stop	`recognition.stop();`

Text2Speech

```
const msg = new SpeechSynthesisUtterance();
msg.text = 'This is my text';
msg.lang = 'en-us';
speechSynthesis.speak(msg);
```

and more …

Camera API

Web workers (multi-threading)

Web sockets (full-duplex communication between browser and server)

Web RTC (P2P communication between browsers)

WebGL (3D)

Phone features