From HTML to PostGIS

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Lecture plan

JavaScript - this lecture's scope reminder

- Purpose and syntax of JavaScript
- JavaScript based web applications (DOM and Events)
  - Creating and changing the contents of the website
  - Event handler properties (*element*.on*sth* = *handler*;)
  - Document Object Model Level 2 Events (`add/removeEventListener`)
  - Creating and changing the styles on the website
    - style property
    - using classes
- Selected additional topics
  - Utilizing canvas
  - jQuery
  - In-context library example: GoogleMaps API

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- **Selected additional topics**
  - **Utilizing canvas**
  - **jQuery**
  - **In-context library example: GoogleMaps API**

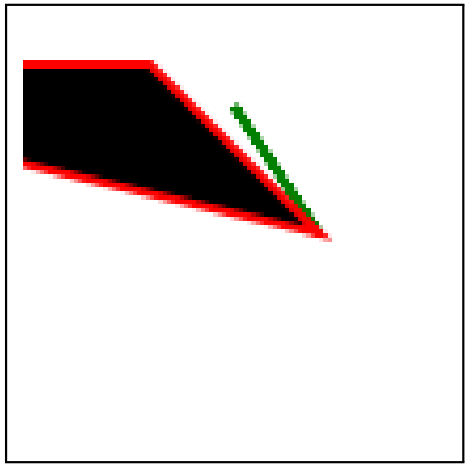
Canvas element

```
<div id="canvascontainer">
    <canvas id="canvas" width="100" height="100"></canvas>
</div>
```

- <canvas> is an HTML block element designed to be used by JavaScript for drawing
- Without JavaScript <canvas> is utterly useless
- In order to draw one needs the context object:
  `var context = canvas.getContext('2d');`

Basic operations and properties

- `context.beginPath();`
- `context.closePath();`
- `context.stroke();`
- `context.fill();`
- `context.strokeStyle;`
- `context.fillStyle;`
- `context.lineWidth;`



Basic canvas example

Shape defining operations

- `context.moveTo(x,y);`
- `context.lineTo(x,y);`
- `context.arcTo(x1,y1,x2,y2,radius);`
- `context.quadraticCurveTo(p1.x,p1.y,x,y);`
- `context.bezierCurveTo(p1.x,p1.y,p2.x,p2.y,x,y);`

Dummy WebPaint: a drawing example

High–level operations and transformations

- `context.rect(x,y,width,height);`
- `context.drawImage(HTML image,x,y);`
- `context.fillText(text,x,y);`
- `context.scale(x,y);`
- `context.rotate(angle);`

Move with arrows (by Karwowski) Move with WSAD (by Okulewicz)

jQuery

- jQuery is a simple JavaScript library supporting code simplification while dealing with applying functions to multiple elements at once
- ...and much more
- jQuery speeds up writing the code and provides universal API for all browsers
- plain JavaScript code will always be faster (if properly written)
- Major releases:
  - 1.x Supports IE 6, 7 and 8 (latest - 1.12.4)
  - 2.x Discontinued
  - 3.x Supports current browsers

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Getting started and basic concepts

The $ operator

- Shorthand for jQuery
- An object with jQuery methods
- A method for wrapping DOM elements with jQuery functionality

DOM loaded

```
$(function() {
  // Handler for .ready() called.
});
```

Motivation

- Slightly shorter syntax in typical tasks
- Easier DOM manipulation
- Animation API
- AJAX API

Warning: don't fall in love with jQuery

Style manipulation

direct styling

```
$('li.c').css('background-color','green');
```

vs.

```
document.querySelectorAll('li.c').forEach(function(item) {
  item.style.backgroundColor = 'green';
});
```

classes

```
$('.c').removeClass('c');
```

vs.

```
document.getElementsByClassName('c').forEach(function(item)
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Events attachment and DOM manipulation

```
$('li').click(listItemClick);
$('p').mousedown(mouseDownHandler);
$('#container').append($('<p id="new">Lorem</p>'));
$('#new').mousedown(mouseDownHandler);
```

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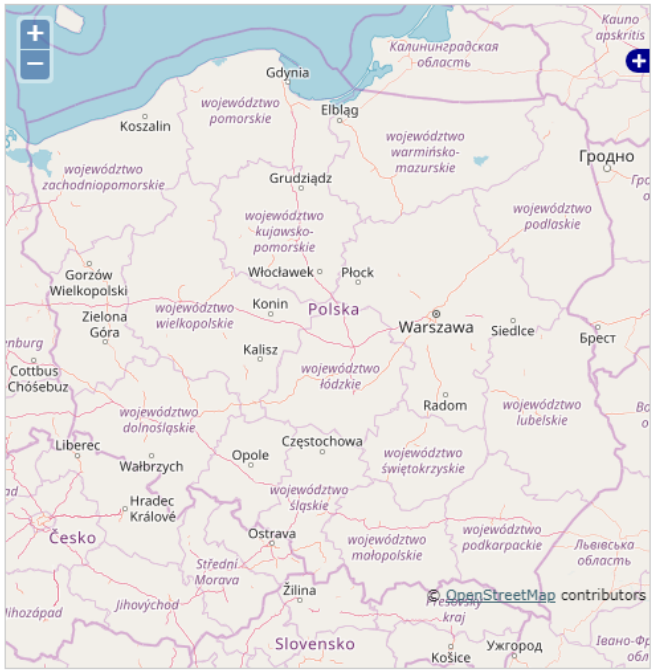
Animations

```
$(li).animate(
  {marginLeft: '+=3em'},
  2000);
```

And finally: some GIS example

Basic OpenLayers example



Basic GoogleMaps example