# HTML5 & CSS3

A chance to Do things Differently

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# Day 3

# Gradient

- Linear Gradient
  - createLinearGradient(startX, startY, endX, endY);
- Radial Gradient
  - createRadialGradient(startX, startY, startRadius, endX, endY, endRadius);
- Note:
  - addColorStop(offset, color);
  - It can be called multiple times to change a gradient
  - Its offset value between 0.0 and 1.0

# Dealing with Image

https://developer.mozilla.org/en-US/docs/Web/API/CanvasRenderingContext2D/drawImage

- To draw an image on canvas area we use
  - *drawImage(imgObj, x, y [, width, height])*
    - *imgObj* defines image required to be displayed, it must be created first and wait for being loaded befor instantiating drawImage().
    - *x,y defines* top left corner of the image relative to the top left corner of the canvas (0,0)
    - *width, height define width, height of the displayed image*
  - Note:
    - Construct your image object using “new Image()”

# Transformation

- Transformation affects all drawing operations that come after it
- 3 basic transformation
  - Translate
  - Scale
  - Rotate
- Transformation is additive
- Its good using save() & restore() for the context state

# Scaling, Rotating & Translating

- scale(x, y)
  - resize current drawing either bigger or smaller
- rotate(angle)
  - rotate the current context around the origin within the canvas area
- translate(x, y)
  - move current context within the canvas area into a different point

# Saving & Restoring Canvas State

- Every canvas object contains a stack of drawing states.
- The canvas state can store:
  - strokeStyle
  - fillStyle
  - font
  - globalAlpha
  - lineWidth
  - lineCap
  - lineJoin
  - miterLimit
  - shadowOffsetX
  - shadowOffsetY
  - shadowBlur
  - shadowColor
  - globalCompositeOperation
  - textAlign
  - textBaseline
  - The current clipping region
  - The current transformation matrix (rotation, scaling, translation)

# SVG Vs. Canvas

?

# Web Worker API

# Web Workers API

- JavaScript was designed to run in a single-threaded environment.
- Web Workers provide a simple means for web content to run scripts in background threads.
- Web Workers are a browser feature which can be accessed through JavaScript
- Types of Web Workers:
  - Dedicated
    - accessible only by the script that called it
  - Shared
    - accessible by multiple scripts
  - etc…

https://developer.mozilla.org/en-US/docs/Web/API/Web_Workers_API/Using_web_workers

# Web Workers API

- Check browser for supporting Worker API

  if(window.Worker){//true→supported}

- Create Worker instance

  var myWorker= new Worker("script.js")

  - Note:
    The URI passed as a parameter to the Worker constructor must obey the "same-origin policy"

- Send data to and from Worker
  - postMessage([,])
  - onmessage

# Web Workers API

- Receive data

  event.data

- Stop Worker
  - From calling script → myWorker.terminate()
  - From worker script → close()

- Import multiple script file

  importScripts("myS2.js", "myS3.js")

# References


- http://slides.html5rocks.com
- http://www.tutorialspoint.com
- http://www.html5canvastutorials.com/tutorials/html5-canvas-element/
- http://okeschool.com/tutorial/549/canvas/canvas-basics/canvas-introduction.html
- http://cheatsheetworld.com/programming/html5-canvas-cheat-sheet/
- http://www.kirupa.com/canvas/canvas_transformations.htm

# z-index

- The z-index property is used to place an element "behind" another element.
- Default z-index is 0.
- The higher number the higher priority. z-index: -1 has lower priority.
- The general format is:

  z-index:n

  OR

  object.style.zIndex=n

Example!

# overflow

- Specifies if content of a block-level element should be clipped when it is larger than the parent element.

- **The general format is :**

  **overflow:visible|hidden|scroll**

  **OR**

  **object.style.overflow="visible|hidden|scroll "**

**Example!**

# CSS3

## Other Selectors & New Properties

# CSS Selectors

- Several types of selectors are defined for use when implementing Style Sheets:
    1. Simple Basic Selectors
    2. Attribute selectors
    3. Combinators
    4. Pseudo-Classes
    5. Pseudo-Elements
- A selector can contain a chain of one or more simple selectors separated by combinators, optionally followed by attribute selectors, ID selectors, or pseudo-classes. but it can contain only one pseudo-element, which must be appended to the last simple selector in the chain

# 4. Pseudo-Classes Selector

- A pseudo-class is similar to a class in HTML, but it’s not specified explicitly in the markup.
- pseudo-class selectors
  1. Dynamic
  2. Link / Target
  3. UI Element
  4. Structural

# 4. Pseudo-Classes Selector

- Dynamic pseudo-class selectors
  - :active
    - matches any element that’s being activated by the user → the "pressed" state of a button-style link
  - :hover
    - matches elements that are being designated by a pointing device. i.e. when the mouse cursor rolls over a link, that link is in it's hover state and this will select it.
  - :focus
    - matches any element that’s currently in focus

# 4. Pseudo-Classes Selector

- Link / Target pseudo-class selector
  - :link
    - matches link elements that are unvisited
  - :visited
    - matches link elements that have been visited
  - :target
    - matches an element that’s the target of a fragment identifier in the document’s URI

# 4. Pseudo-Classes Selector

- UI element pseudo-class selectors
  - :enabled
    - matches user interface elements that are enabled
  - :disabled
    - matches user interface elements that are disabled
  - :checked
    - matches elements like checkboxes or radio buttons that are checked.

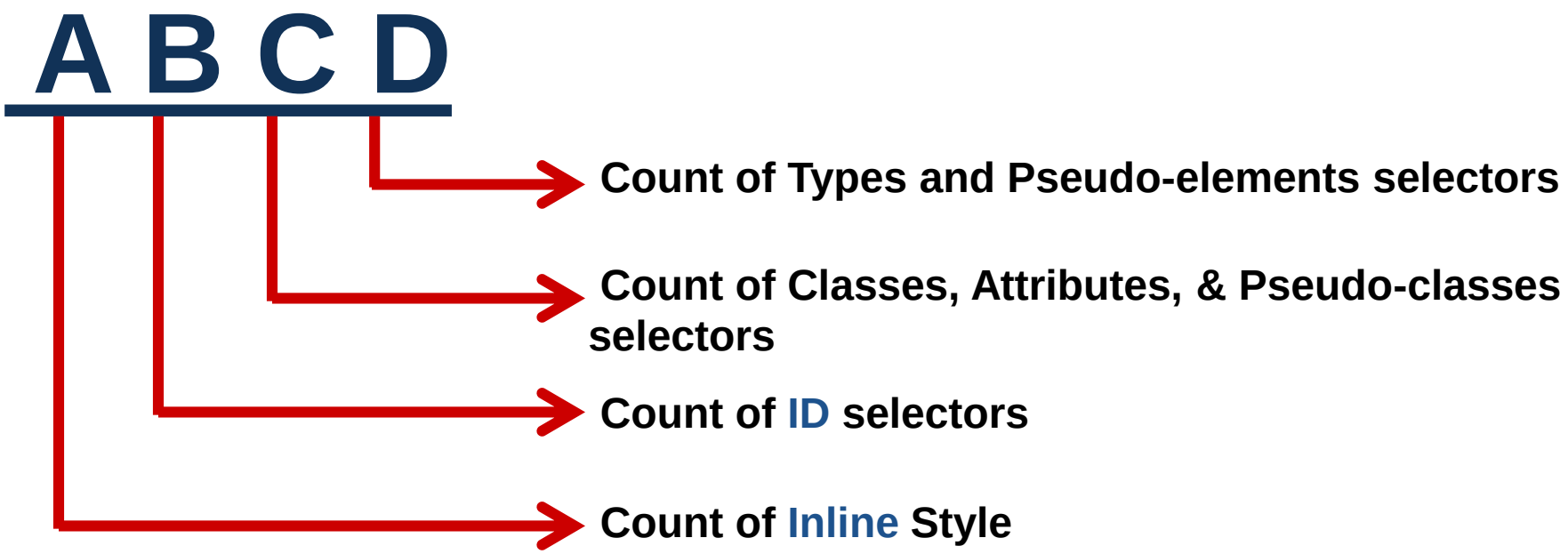
# 4. Pseudo-Classes Selector

- Structural (Position-Number based) pseudo-class selectors
  - :first-child
  - :last-child
  - :only-child
  - :nth-child(n)
  - :nth-last-child(n)
  - :first-of-type
  - :last-of-type
  - :only-of-type
  - :nth-of-type(n)
  - :nth-last-of-type(n)
  - etc.

# 5. Pseudo-Element Selector

- Pseudo-elements match virtual elements that don't exist explicitly in the document tree.
- In CSS1 and CSS2, pseudo-elements start with a colon (:) In CSS3, pseudo-elements start with a double colon (::), which differentiates them from pseudo-classes.
- :first-letter
  - represents the first character of the first line of text within an element
- :first-line
  - represents the first formatted line of text
- :before
  - specifies content to be inserted before another element
- :after
  - specifies content to be inserted after another element
- ::selection
  - represents a part of the document that's been highlighted by the user

# Specificity



# Specificity

**Example**

```
body#home div#warning p.message { color: red; }
```

| Inline Style | IDs | Classes, Attributes, and Pseudo-classes | Element Types and Pseudo-elements |
|---|---|---|---|
| 0 | 2 | 1 | 3 |

# Specificity

**Example**

```
ul#nav li.active a { color: red; }
```

| Inline Style | IDs | Classes, Attributes, and Pseudo-classes | Element Types and Pseudo-elements |
|---|---|---|---|
| 0 | 1 | 1 | 3 |

# Specificity

**Example**

```
#footer *:not(nav) li{ color: red; }
```

| Inline Style | IDs | Classes, Attributes, and Pseudo-classes | Element Types and Pseudo-elements |
|---|---|---|---|
| 0 | 1 | 0 | 2 |

**Note:**
The :not() sort-of-pseudo-class adds no specificity by itself, only what's inside the parens is added to specificity value.

# Specificity Important Notes

- The universal selector (*) has no specificity value
- Pseudo-elements (e.g. :first-line) get 0,0,0,1 unlike their pseudo-class which get 0,0,1,0
- The pseudo-class :not() adds no specificity by itself, only what's inside it's parentheses
- The **!important** value appended a CSS property value is an *automatic win*.

# New Properties

# New Properties

- @rule
- Animation
- Transition
- Transformation (2D,3D)
- …etc.

# Opacity

- Specifies the transparency of an element
- Opacity has a default initial value of 1
  - Range: 0.0 (invisible) to 1.0 (solid)
- Not inherited, but a child element less transparent than the parent.

Example!

# Shadowing

https://cssgenerator.org/box-shadow-css-generator.html

- Text Shadow

http://www.cssmatic.com/

- Box Shadow
  - The box-shadow property allows designers to easily implement multiple drop shadows (outer or inner) on box elements, specifying values for color, size, blur and offset.

Example!

# Vendor Extension Prefixes

| Prefix | Organization |
| --- | --- |
| -moz- | Mozilla Foundation |
| -ms- | Microsoft |
| -o- | Opera Software |
| -webkit- | Safari and Chrome |

http://expressprefixr.herokuapp.com/

# @rule

- At-rules are instructions or directives to the CSS parser. They can be used for a variety of purposes.
  - @charset
  - @import
  - @media
  - @page
  - @font-face
  - @namespace
  - @keyframe

# Font Style

@font-face & Different Formats

| |  |  |  |  |  |
|---|---|---|---|---|---|
| **ttf** | ✔ | ✔ | ✔ | ✔ | ✔ |
| **otf** | ✔ | ✔ | ✔ | ✔ | ✔ |
| **svg** | ✔ | | ✔ | | ✔ |
| **eot** | | | | ✔ | |
| **woff** | ✔ | ✔ | ✔ | ✔ | ✔ |

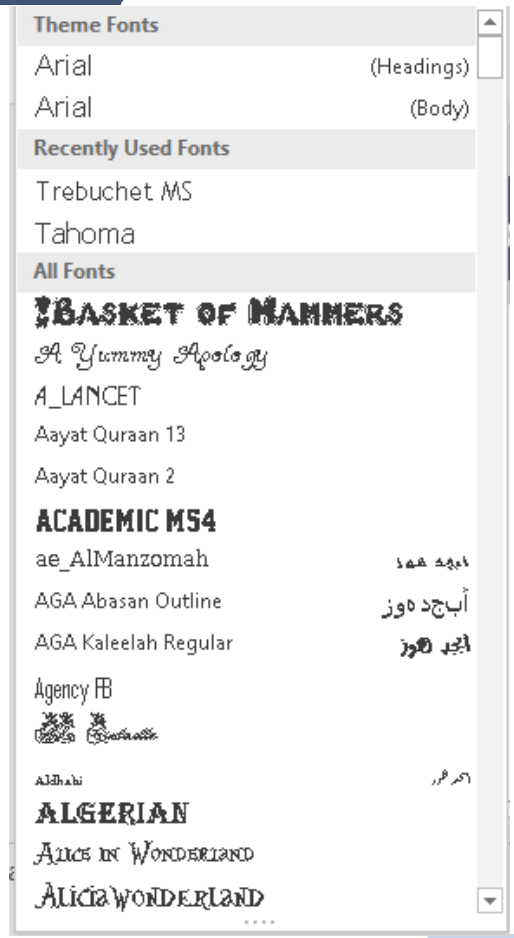
**@font-face:** allows specifying custom fonts

http://fontsquirrel.com/
https://www.dafont.com/
https://fonts.google.com/

Example!

# Font Collections

- Serif
  - Time New Roman
- Sans-serif
  - Arial
- Cursive
  - *Comic sans*
- Fantacy
  - **Impact**
- Monospace
  - Courier New



# Animation

| Property | Description |
|---|---|
| @keyframes | Specifies the animation |
| animation | A shorthand property for all the animation properties below, except the animation-play-state property |
| animation-name | Specifies a name for the @keyframes animation |
| animation-duration | Specifies how many seconds an animation takes to complete one cycle |
| animation-timing-function | Specifies the speed curve of the animation (linear\|ease\|ease-in\|ease-out\|ease-in-out..) |
| animation-delay | Specifies when the animation will start |
| animation-iteration-count | Specifies the number of times an animation should be played |
| animation-direction | Specifies whether or not the animation should play in reverse on alternate cycles (normal\|alternate..) |

# Transform

- Applies a 2D or 3D transformation to an element
  - rotate, scale, skew, translate.. etc.
  - i.e. scale(x,y), scale3d(x,y,z), scaleX(x), scaleY(y), scaleZ(z).. etc.

Example!

# Transform

| Property | Description |
| --- | --- |
| transform | Applies a 2D or 3D transformation to an element<br>rotate, scale, skew, translate.. etc.<br>i.e. scale(x,y), scale3d(x,y,z), scaleX(x), scaleY(y), scaleZ(z).. etc. |
| transform-origin | Allows you to change the position on transformed elements<br>*x-axis y-axis z-axis*; |

Example!

# Transition

- Allows property changes in CSS values to occur smoothly over a specified duration.

| Property | Description |
|---|---|
| transition | A shorthand property for setting the four transition properties |
| transition-property | Specifies the name of the CSS property the transition effect is for |
| transition-duration | Specifies how many seconds or milliseconds a transition effect takes to complete |
| transition-timing-function | Specifies the speed curve of the transition effect |
| transition-delay | Specifies when the transition effect will start |

Example!

# References


- http://slides.html5rocks.com
- http://www.tutorialspoint.com
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- http://okeschool.com/tutorial/549/canvas/canvas-basics/canvas-introduction.html
- http://cheatsheetworld.com/programming/html5-canvas-cheat-sheet/
- http://www.kirupa.com/canvas/canvas_transformations.htm

# References


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- https://developer.mozilla.org/en-US/docs/Web/API/Window/getComputedStyle
- http://code.tutsplus.com/
- http://www.sitepoint.com
- http://www.css3.info/
- https://www.html5rocks.com/en/tutorials/filters/understanding-css/
- https://css-tricks.com/examples/ShapesOfCSS/

# Assignments