FE101

CSS Transitions & Animations

Final Project

Your final project is to build the front end for a web application. It does not have to be functional as far as back-end data processing, but should incorporate all that you’ve learned in the class thus far.

You’re welcome to partner with a student from ROR101 on the final project.

Final projects will be presented on the last day of class!

A note on cross-browser compatability

- All of the things you'll learn this week may not work well in older browsers
- Always be sure to cross-browser test your work if working on a production website
- Also, use vendor prefixes, -prefix-free, or SASS Mixins that provide vendor prefixes - for the purposes of this presentation, we'll assume you'll add vendor prefixes yourself later on

2D Transforms

- The most basic form of “advanced” CSS is the 2D transform

- An element can be moved around the page with ease and made to look different using the various transform functionalities

`scale()`

```
transform: scale(4, 2);
```

transforms the width to be 4 times its original size and the height to be 2 times its original size

`translate()`

```
transform: translate(25px, 50px);
```

moves an element 25 pixels from the left and 50 pixels from the top

`rotate()`

```
transform: rotate(30deg);
```

rotates an element 30 degrees.

```
transform: rotate(-30deg);
```

negative values rotate the element counter-clockwise

`skewX() and skewY()`

```
transform: skewX(60deg) skewY
(40deg);
```

turns the element 60 degrees on the x axis and 40 degrees around the y axis

(`skew()` by itself was deprecated)

3D Transforms

```
transform: rotateX(120deg);
```

Rotates an element 120 degrees around its x axis

```
transform: rotateY(160deg);
```

Rotates an element 160 degrees around its y axis

Exercise

Build an example page with `<h2>` headings denoting each function to illustrate `scale`, `translate`, `rotate`, `skew`, `rotateX`, and `rotateY` CSS transforms

1 Minute Break

Transitions

A transition changes one or many attributes of an element’s style gradually

```
transition: width 10s;
```

The above will define the time of a `transition` if the `width` property changes, for instance if the element has a different `width` on `:hover`

Transitions

Transitions can also be broken out into their component properties:

```
transition-property: background-color;
transition-duration: 1s;
transition-timing-function: linear;
transition-delay: 2s;
```

`transition-property`

Defines the CSS property that a transition is applied to.

```
transition-property: width;
transition-property: background-
color;
```

```
transition: <property> <duration>
<timing-function> <delay>;
```

`transition-delay`

Specifies how long until the transition starts

```
transition-delay: 2s;
```

```
transition: <property> <duration>
<timing-function> <delay>;
```

transition-duration

Specifies how long the transition will last

```
transition-duration: 2s;
```

```
transition: <property> <duration>
<timing-function> <delay>;
```

`transition-timing-function`

Specifies which “timing function” or “easing” will be used for the transition.

Possible values include `ease`, `linear`, `ease-in`, `ease-out`, `ease-in-out`, and `cubic-bezier` to define custom functions.

```
transition-timing-function: cubic-bezier
(0,0,0.58, 1);
transition: <property> <duration>
<timing-function> <delay>;
```

easings.net

Check out easings.net for more examples of easing functions

Transitions

some sample code - element width

```
.box{
  background-color: orange;
  width: 200px;
  height: 100px;
}

.box:hover{
  width: 400px;
  height: 100px;
}

.box{
  transition: 10s width;
}
```

```
<div class="box">
  Hi  box.
</div>
```

Transitions

some *more* sample code - background color and linear easing

```
.box{
  background-color: #CCCC33;
  width: 200px;
  height: 100px;
}

.box:hover{
  width: 400px;
  height: 100px;
  background-color: #0E0EFF;
}

.box{
  transition: background-color 4s linear;
}
```

```
<div class="box">
  Hi  box.
</div>
```

Multiple transitions together

You can have multiple properties transition, they just have to be separated by commas:

```
transition: width 10s, background-
color 10s linear;
```

The above will set up transitions for the `width` property and the `background-color` property. `linear` is the type of easing, or “timing function” that will be used

Transitions

some *more* sample code - background color + width

```
.box{
  background-color: #CCCC33;
  width: 200px;
  height: 100px;
}

.box:hover{
  width: 400px;
  height: 100px;
  background-color: #0E0EFF;
}

.box{
  transition: background-color 4s linear, width 4s;
}
```

```
<div class="box">
  Hi  box.
</div>
```

Exercise

Try building different CSS transitions on 3 different elements. Try animating the following properties:

```
background
width
padding
margin
color
```

10 Minute Break

CSS3 Animations

Remember when the web was covered in Macromedia Flash videos and games?

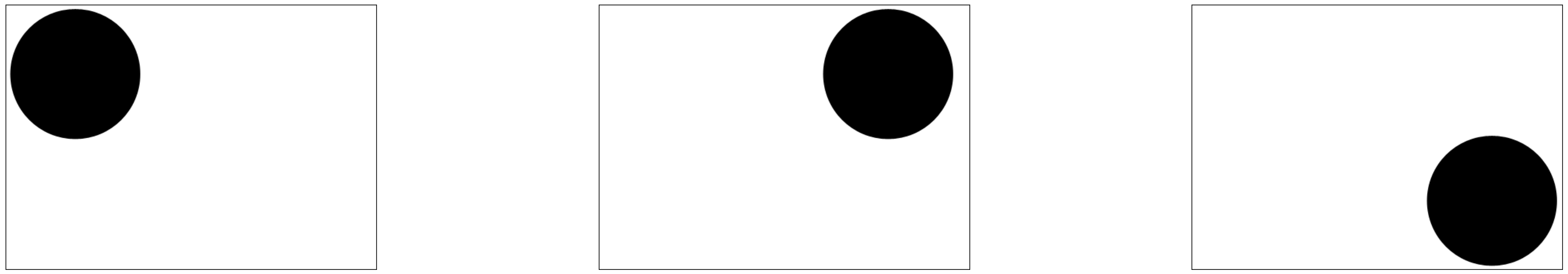
A similar effect can now be achieved with straight CSS using CSS3 animations.

These allow the use of **keyframes** to define the breakpoints of an animation

Keyframes

A keyframe is a moment that defines the starting and ending points of a smooth transition

For instance, if an object was moving to the right and to the bottom of the screen in an animation, you'd might have the following keyframes:



CSS3 Animations

The way CSS3 animations work: you define an animation by defining keyframes based on percentages

For instance, if your animation has a keyframe at 50% and is 6 seconds long, the animation will reach that keyframe at the 3 second mark

For animations, you'll almost definitely have to use a vendor prefix (-webkit-)

Keyframes

```
@-webkit-keyframes some-keyframe{
  0% {margin-left: 0px; margin-top: 0px;}
  25% {margin-left: 50px; margin-top: 50px;}
  50% {margin-left: 50px; margin-top: 150px;}
  100% {margin-left: 200px; margin-top: 200px;}
}
```

Calling Your Animation

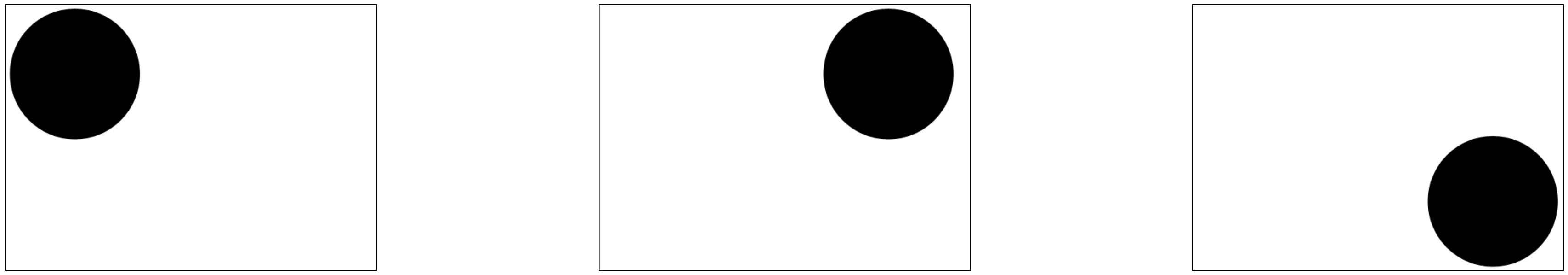
Now that you’ve defined keyframes for your animation, you have to call the animation on an element and define a few more options for the animation itself

Animation Properties

```
.box{
  /*The name of your defined animation (after @keyframes)
*/
  -webkit-animation-name: some-keyframe;
  /*How long the animation will run*/
  -webkit-animation-duration: 5s;
  /*Which easing/timing function to use */
  -webkit-animation-timing-function: linear;
  /*How long to wait before starting the animation*/
  -webkit-animation-delay: 2s;
  /*how many times to run it (can be infinite)*/
  -webkit-animation-iteration-count: 2;
  /*should animation play in reverse on alternate runs */
  -webkit-animation-direction: alternate;
  /*should the animation start of running or paused */
  -webkit-animation-play-state: running;
}
```

Exercise

Try constructing the animation illustrated on the Keyframes slide! Your element doesn’t necessarily have to be circular, but it should travel to the right and then the bottom of the screen



You can do some pretty crazy things with CSS3 Animations.

CSS Solar System:
http://codepen.io/juliangarnier/pen/idhuG

CSS Creatures:
http://bennettfeely.com/csscreatures/

Original Hover Effects:
http://tympanus.
net/Tutorials/OriginalHoverEffects/

Alternate ways to trigger transitions

Remember how we were only using :hover events in the last class to trigger transitions?

You could just apply a class using JavaScript:

```
$(“some-trigger”).click(function(){
  $(“.some-animated-element”).
addClass(“transition-class”)
})
```

Best Practices

- Best-practices-wise, you should probably use as little JavaScript as possible when creating CSS3 animations/transitions

- Instead, try to achieve what you’re looking to achieve through CSS unless it is practically impossible.

- Another place to use JavaScript might be if a certain transition is having cross-browser compatibility problems - these will vary depending on many factors because CSS3 animations are still not widely supported

Exercises

Our goal today is to gain mastery over the material we learned in the last class.

To that end, you have two options:

1. Try to emulate some of the CSS3 animations/transitions on the next slide

2. Hack on your own animations/transitions all class!

Projects to Emulate

Try not to view source unless you're really stumped!

http://www.develop-a-website.com/cssanimation/css-animation.html

http://www.develop-a-website.com/cssanimation/css-animation4.html

http://www.develop-a-website.com/cssanimation/css-animation2.html

http://www.develop-a-website.com/cssanimation/css-animation3.html

Find our own to emulate at CodePen (be careful, the source will be right there so click the checkbox in the source editor to hide it)

http://codepen.io/