CSS 3
Animations and Transitions

Overview

- **:hover** selector
- transition properties (new CSS 3)
- animation properties (new CSS 3)

:hover selector

- **:hover** applies a CSS style to an element when the user moves the cursor onto the element

- syntax

```
element:hover { style_properties }
```

For example

```
a:hover
{
    background-color: cyan;
}
```

CSS file

Web browser

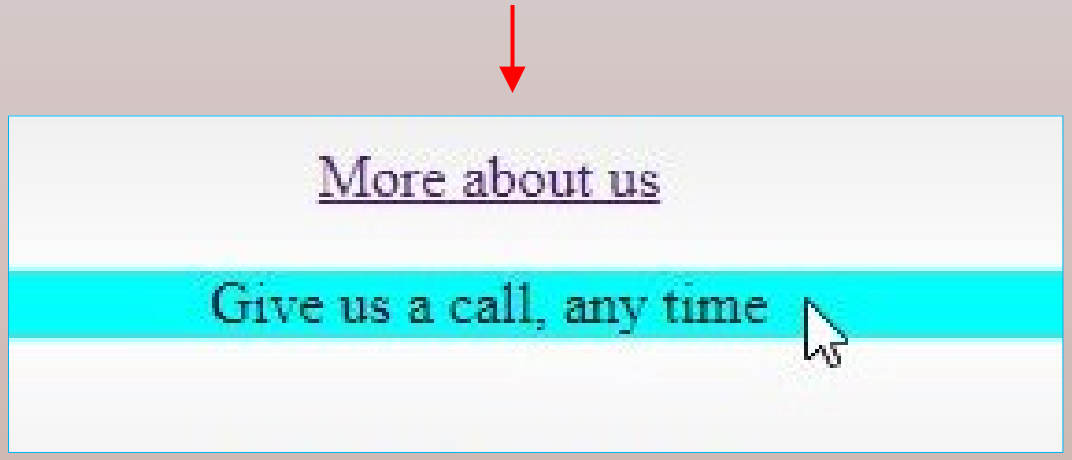
:hover selector

- **:hover** can be used with all elements
  - **not just links**

For example

```
a:hover, p:hover
{
    background-color: cyan;
}
```

CSS file



Web browser

:hover selector

- **:hover selector** can be used with:
  - **HTML selector**
  - **id selector**
  - **class selector**

```
a:hover, #top1:hover, .column1:hover
{
    background-color: cyan;
    font-weight: bold;
}
```

transition properties

- **CSS 3 transitions** allow CSS property values to be changed gradually over a specified duration

  - By default, CSS property value changes are instant

    for example:

    a) using the **hover** selector to change a background color, the change will be instant

    b) using the **hover** selector **with CSS transitions,** a background color could be changed gradually from one color to another over a given duration

transition properties

- 5 main transition properties
  - transition-property
  - transition-duration
  - transition-timing-function
  - transition-delay
  - transition

transition properties

1. **transition-property**
   - specifies the CSS property on which the transition should be applied

2. **transition-duration**
   - specifies the number of seconds a transition should take to complete

transition properties

- **transition-property** and **transition-duration** example

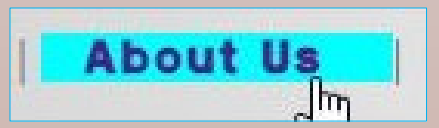
```
a:hover
{
    background-color: cyan;
    font-weight: bold;

    transition-property: background-color;
    transition-duration: 5s;
}
```

In the example, the <a> element **background color** will change from its **default color** to a **cyan color** over a period of **5 seconds**

After 0 seconds

After 1 second



After 5 second

transition properties

- **transition-property** and **transition-duration**
  - **Default duration**
    - is **0s (zero seconds)**
    - whereby the transition will have no effect as the property change will be instant

transition properties

- **transition-property** and **transition-duration**

  - **all** keyword

    - **transition-property** can be used with **all** keyword
    - this will apply the transition to all CSS properties in the CSS style

```
a:hover
{
    color: green;
    font-size: 15px;

    transition-property: all;
    transition-duration: 3s;
}
```

color and **font-size** will change over 3 seconds

transition properties

- **transition-property** and **transition-duration**

  - multiple **transition properties** can be set in the same line

```
a:hover
{
    color: green;
    font-size: 15px;

    transition-property: color, font-size;
    transition-duration: 3s, 10s;
}
```

color will change over **3 seconds**
font-size will change over **10 seconds**

transition properties

3. **transition-timing-function**

- allows a transition effect to change speed over its duration

- 4 main values
  - linear
  - ease-in
  - ease-out
  - ease (default)

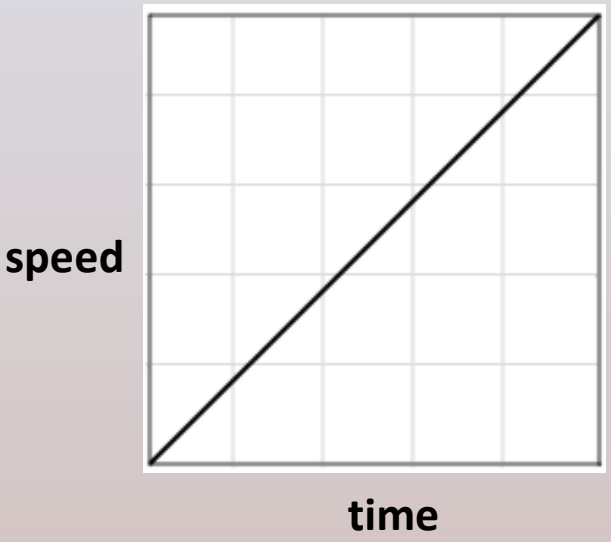
```
a:hover
{
    background-color: cyan;
    font-size: 25px;

    transition-property: all;
    transition-duration: 5s;
    transition-timing-function: linear;
}
```

transition properties

transition-timing-function, **linear** value

- transition goes from its initial state to it final state with a constant speed



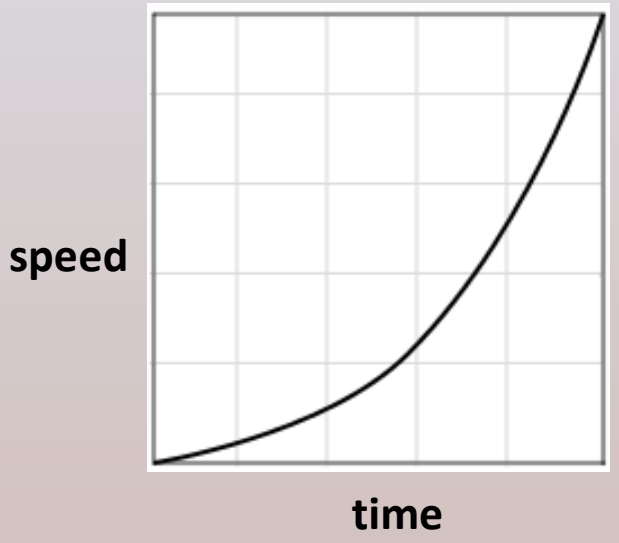
I. for example, assuming <a> element **background color** will change from **white** to **cyan color** over a period of **5 seconds:**

II. then the elements background will be half-way between white and cyan at **2.5 seconds** with **transition-timing-function: linear;**

transition properties

transition-timing-function, **ease-in** value

- transition begins slowly, then progressively increases in speed until the final state is reached

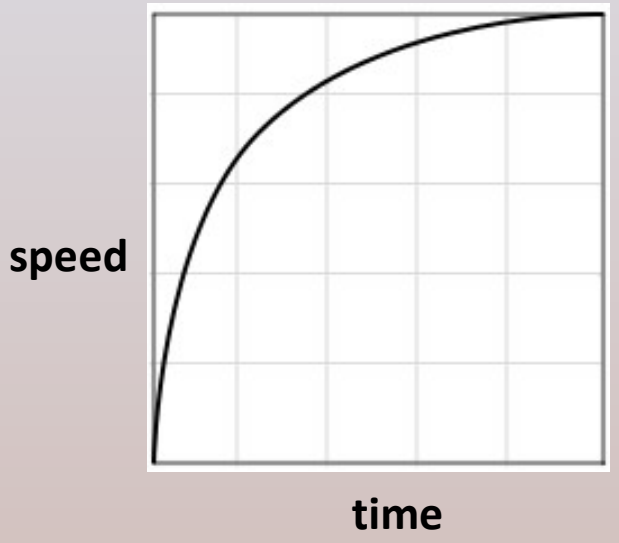



```
transition-timing-function: ease-in;
```

transition properties

transition-timing-function, **ease-out** value

- transition starts with a high speed and then progressively slows down while approaching the final state

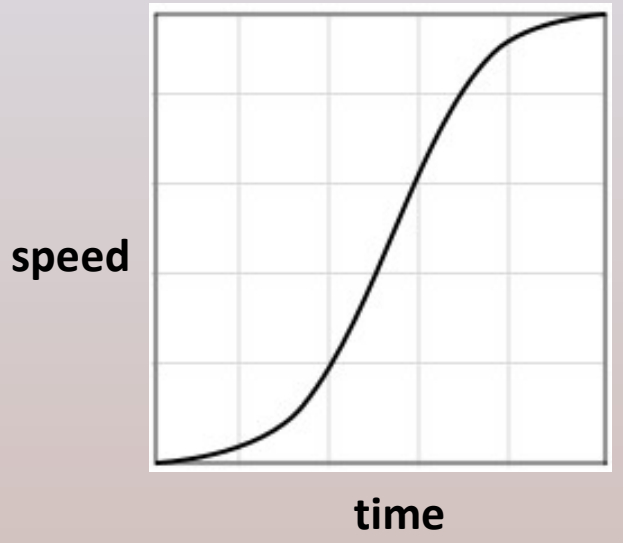



```
transition-timing-function: ease-out;
```

transition properties

transition-timing-function, **ease** value

- transition starts slow, accelerates, then slows down when approaching its final state




```
transition-timing-function: ease;
```

(the default)

transition properties

- **transition-delay** property
  - specifies when the transition will start

For example

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

  - default value: **0s**
    - zero seconds

transition properties

- **transition** property
  - allows the web-designer to set the *transition-property*, *transition-duration*, *transition-timing-function* and *transition-delay* in one line

- syntax:

- **transition:** *property* duration timing-function delay

For example

```
transition:  all 3s linear 0s;
```

default:

transition: **all 0s ease 0s;**

animation properties

- **CSS 3 animations**
  - allow the web-designer to specify the changes in CSS properties over time using keyframes

animation properties

- 3 steps to using CSS animation:

1. @keyframes
   - define keyframe using **keyframes-rule**

2. animation-name
   - referring to the keyframe **by name** using the **animation-name** property

3. animation-duration
   - specifying a duration for the animation using **animation-duration** property

animation properties

- using CSS animation example: *(animate direction)*

```
/* Animation Direction Example */

@keyframes moveExample
{
    from { left: 0px; }
    to { left: 300px; }
}

.aniClass
{
    animation-name: moveExample;
    animation-duration: 5s;

    position: relative;
}
```

animation properties

- using CSS animation example: *(animate color)*

```
/* Animation Color Example */

@keyframes col_Example
{
    from {color: green;}
    to { color: purple; }
}

.aniClass
{
    animation-name: col_Example;
    animation-duration: 5s;
}
```

animation properties

- using CSS animation
- animatable CSS properties
  - **@keyframes** rule uses **animatable CSS properties**

```
@keyframes col_Example
{
    from {color: green;}
    to { color: purple; }
}
```

animation properties

example of **animatable** properties:

- border
- background-color
- color
- margin
- padding
- top
- left

-Note: not all **CSS properties** are **animatable**

-Link to full-list of **CSS animatable properties:**
https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_animated_properties

animation properties

- keyframe percentages
  - **@keyframe rule** can use percentages.
    - **each** percentage represents a percentage of the **animation duration**

```
@keyframes moveExample2
{
    0% {left: 0px;}
   25% {left: 300px; }
   50% {left: 100px; }
   75% {left: 100px; }
   100% {left: 0px; }
}

.aniClass
{
    animation-name: moveExample2;
    animation-duration: 5s;

    position: relative;
}
```

animation properties

- keyframe percentages, note:
  - keyword **'from'** same as using **0%**
  - keyword **'to'** same as using **100%**

```
@keyframes moveExample
{
    from { left: 0px; }
    to { left: 300px; }
}
```

```
@keyframes moveExample2
{
     0% {left: 0px;}
    25% {left: 300px; }
    50% {left: 100px; }
    75% {left: 100px; }
    100% {left: 0px; }
}
```

animation properties

- 7 main animation properties
  a. animation-name
  b. animation-duration
  c. animation-timing-function
  d. animation-delay
  e. animation-iteration-count
  f. animation-direction
  g. animation

animation properties

1. **animation-name**
   - refers to a **keyframes rule** by name

2. **animation-duration**
   - specifies the number of seconds an animation should take to complete

For example

```
animation-name: moveExample;
animation-duration: 5s;
```

animation properties

3. **animation-timing-function**

- specifies how the animation will change speed over the animation duration
  - uses easing functions

- main possible values
  - linear
  - ease-in
  - ease-out
  - ease

animation-timing-function: ease-in;

Note:
animation-timing-function values, work in a similar manner as **transition-timing-function** (see slide 14 – 17 above)

animation properties

4. **animation-delay**

- specifies when the animation will start

```
animation-delay: 5s;
```

- default value: **0s**
  - zero seconds

animation properties

5. **animation-iteration-count**

- specifies how many times the animation should play before stopping

```
animation-iteration-count:  3;
```

- default value: **1**
  - (integer value **one**)

use keyword **'infinite'** and the animation will repeat infinitely

```
animation-iteration-count:  infinite;
```

animation properties

6. **animation-direction**

- specifies if the animation should play in reverse or normal order

```
animation-direction: reverse;
```

- possible values
  - **normal -** animation plays in normal order **(default)**
  - **reverse** - animation plays backwards (starting from the 100% keyframe)
  - **alternate** - animation plays forwards and then backwards

animation properties

- **animation** property
  - allows the web-designer to set multiple *animation properties* in one line

- basic syntax:
- **animation:** *name duration timing-function delay count direction*

For example

```
animation: moveExample 5s linear 0s infinite normal;
```