CSS: the language of Web design

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Learning goals

- **Position and style** HTML elements according to a given design
- **Employ** pseudo-classes and pseudo-elements
- **Employ** CSS' data access/creation facilities
- **Write** CSS media queries
- **Create** CSS-based animations

https://codepen.io/charlottehase/pen/abzYoQp

A word of warning ...

A bit of context (again).

Cascading Style Sheets (CSS)

- **CSS1**: W3C recommendation in **1996**
  - Fonts, colours, alignment, margins, ids and classes
- **CSS2**: W3C recommendation in **1998**
  - Media queries, element positioning, etc.
- **CSS2.1**: W3C recommendation in **2011**
  - Fixed errors and added already implemented browser features
- **CSS3**: **specification split up** into modules; progress varies
  - https://www.w3.org/Style/CSS/current-work
  - Polyfills, fallbacks

Geometry Interfaces Level 1	CR	CR
CSS Cascading and Inheritance Level 4	CR	PR
CSS Scroll Snap Level 1	CR	PR
CSS Painting API Level 1	CR	PR
CSS Writing Modes Level 4	CR	PR

Refining	**Current**	**Upcoming**	**Notes**
CSS Animations Level 1	WD	WD	
Web Animations	WD	WD	
CSS Text Level 3	WD	CR	
CSS Transforms Level 1	CR	PR	
CSS Transitions	WD	CR	
CSS Box Alignment Level 3	WD	WD	
Selectors Level 4	WD	WD	
CSS Lists Level 3	WD	WD	
Motion Path Level 1	WD	W	
Preview of CSS Level 2	FPWD	NC	
CSS Fonts Level 4	WD	W	
CSS Easing Functions Level 1	WD	W	

Abbreviation	Full name
FPWD	First Public Working Draft
WD	Working Draft
CR	Candidate Recommendation
PR	Proposed Recommendation
REC	Recommendation

CSS3

- Impossible to write complex CSS that relies on modern features and works across all browsers

- Implementation of CSS3 features should be decided based on:
  - **intended users**
  - **mode of usage**
  - **type** of web app

Revision chapter 3

Chapter 3 of the course book

CSS describes how elements in the DOM should be rendered.

px: "the magic unit of CSS"

```
body {
  background-color: #ffff00;
  width: 800px;
  margin: auto;
}
h1 {
  color: maroon;
}
p span {
  color: gray;
  border: 1px solid gray;
}
p#last {
  color: green;
}
```

selector

property

value

140+ color names in CSS3

Three types of style sheets:

(1) **browser's** style sheet

(2) **author's** style sheet

(3) **user's** style sheet overriding

Style sheets are processed in order; **later declarations override earlier ones** (if they are on the same or a higher *specificity* level)

`!important` overrides all other declarations

Pseudo-elements and pseudo-classes

Pseudo-class

Pseudo-class: a keyword added to a **selector** which indicates a **particular state or type** of the corresponding element.

Pseudo-classes allow styling according to (among others) **document external** factors (e.g. mouse movements, user browsing history).

```
selector:pseudo-class {
    property: value;
    property: value;
}
```

Children & types

`:nth-child(X)` any element that is the X[th] child element of its parent

n represents a number starting at 0 and (X can be an int or formula, e.g. "2n+1")

`:nth-of-type(X)` any element that is the X[th] sibling of its type

```
<main>
  <h1>Weather</h1>
  <span id="c1"></span>
  <span id="c2"></span>
  <span id="c3"></span>
  <span id="c4"></span>
  <span id="c5"></span>
  <span id="c6"></span>
  <span id="c7"></span>
  <span id="c8"></span>
</main>
```

parent

4th child

```
span {
    width: 100px;
    height: 100px;
    display: inline-block;
  }

  span:nth-child(2n){
    background-color: tomato;
  }

  span:nth-child(2n+1){
    background-color: orange;
  }

  span:nth-child(4){
    border: 4px solid black;
  }

  span:nth-of-type(4){
    border: 4px solid darkviolet;
  }
```

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  <span id="c2"></span>
  <span id="c3"></span>
  <span id="c4"></span>
  <span id="c5"></span>
  <span id="c6"></span>
  <span id="c7"></span>
  <span id="c8"></span>
</main>
```

siblings

```
span {
    width: 100px;
    height: 100px;
    display: inline-block;
  }

  span:nth-child(2n){
    background-color: tomato;
  }

  span:nth-child(2n+1){
    background-color: orange;
  }

  span:nth-child(4){
    border: 4px solid black;
  }

  span:nth-of-type(4){
    border: 4px solid darkviolet;
  }
```

Popular pseudo-classes

Pseudo-class	Equivalent to
`:first-child`	`:nth-child(1)`
`:last-child`	`:nth-last-child(1)`
`:first-of-type`	`:nth-of-type(1)`
`:last-of-type`	`:nth-last-of-type(1)`

CSS variables

included in 2015-16 in major browsers

`:root` represents the <html> element; **global scope CSS variables** can be added:

1. custom prefix --
2. variable access via var()

Local scope CSS variables can be added everywhere (but are only accessible within their {...})

```
:root {
  /* 100+ color names exist, check e.g.
     * https://en.wikipedia.org/wiki/Web_colors
     */
  --boardColor1: steelblue;
  --boardColor2: deeppink;
  --hoverTextColor: mediumvioletred;
  --borderBoardColor: pink;
  --nailColor: darkblue;
  --boardRotationStart: 5deg;
  --boardRotationEnd: -5deg;
  --switchOnColor: dodgerblue;
  --switchOffColor: grey;
  --switchColor: white;
}
```

```
.letter {
  width: 130px;
  height: 150px;
  /* border-radius rounds the corners of an element */
  border-radius: 0 0 20px 20px;
  /*linear-gradient creates an img based on 2+ colors */
  background: linear-gradient(to top, var(--boardColor2), var(--boardColor1));
  border: 5px solid var(--borderBoardColor);
  opacity: 0.7; /*determines transparency: 0 (invisible), 1 (opaque) */
  /* creates shadow around element: x-offset, y-offset, blur amount, color
   */
  box-shadow: 5px 5px 10px var(--boardColor2);
  ...
}
```

Hover & active

Often employed in:
- image galeries
- dropdown menus

`:hover`	a pointing device (mouse) hovers over the element
`:active`	the element is currently being active (e.g. clicked)

```css
button {
  background: white;
  color: darkgray;
  width: 100px;
  padding: 5px;
  font-weight: bold;
  text-align: center;
  border: 1px solid darkgray;
}

button:hover {
  color: white;
  background: darkgray;
}

button:active {
  border: 1px dashed;
  border-color: black;
}
```

Enabled & disabled

`:enabled`

an element that can be clicked/ selected

`:disabled`

an element that cannot be clicked/ selected

game project:
not all tiles/buttons are available at all times
(e.g. connect4: disable columns that are already full)

```css
button {
  background: white;
  color: darkgray;
  width: 100px;
  padding: 5px;
  ...
}

button:enabled:hover {
  color: white;
  background: darkgray;
}

button:enabled:active {
  border: 1px dashed;
  border-color: black;
}

button:disabled {
  background: #ddd;
  color: #aaa;
}
```

pseudo-classes can be combined (logical and)

Not

`:not(X)`

matches all elements that are not represented by selector X

```
<main>
  <h2>Todos</h2>
  <p id="firsttodo">Today's todos</p>
  <p class="todo">Tomorrow's todos</p>
  <p class="todo">Saturday's todos</p>
  <p>Sunday’s todos</p>
</main>
```

```
main :not(.todo) {
  color: orange;
}
```

`el1 el2`: selects all `<el2>` elements inside `<el1>`

Not

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  <h2>Todos</h2>
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  <p>Sunday's todos</p>
</main>
```

```
main *:not(.todo) {
  color: orange;
}
```

`el1 el2`: selects all `<el2>` elements inside `<el1>`

whitespace in selectors implies the universal selector: `*`

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</main>
```

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```

`el1 el2`: selects all `<el2>` elements inside `<el1>`

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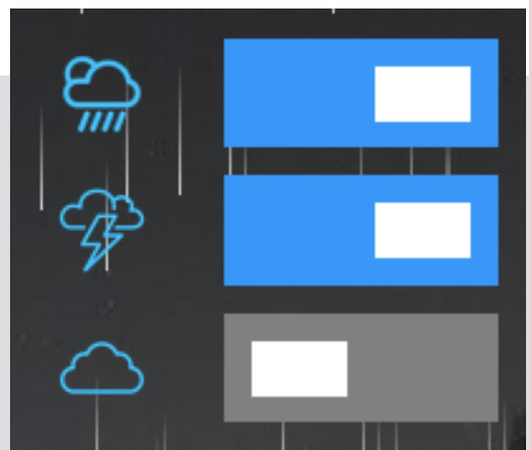
Selector combinations

Selector	Description
e1	Selects all <e1> elements
e1 e2	Selects all <e2> elements within <e1>
e1,e2	Selects all <e1> elements and all <e2> elements
e1>e2	Selects all <e2> elements that have <e1> as parent (i.e. direct children)
e1+e2	Selects all <e2> elements that follow <e1> immmediately



Pseudo-elements

- Create **abstractions** about the **document tree** beyond those specified by the document language
- Provide access to an element's **sub-part**
- `::` notation, however, one-colon notation is also acceptable for older pseudo-elements

Two firsts

`::first-letter`

`::first-line`

Canonical example: enlarge the first letter/line of a paragraph

```css
p::first-line {
  color: gray;
  font-size: 125%;
}

p::first-letter {
  font-size: 200%;
}
```

relative font size changes

```html
<p>
To be, or not to be, that is the question—
</p>
<p>
Whether 'tis Nobler in the mind to suffer
The Slings and Arrows of outrageous
Fortune,…
</p>
```

Two firsts

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Canonical example: enlarge the first letter/line of a paragraph

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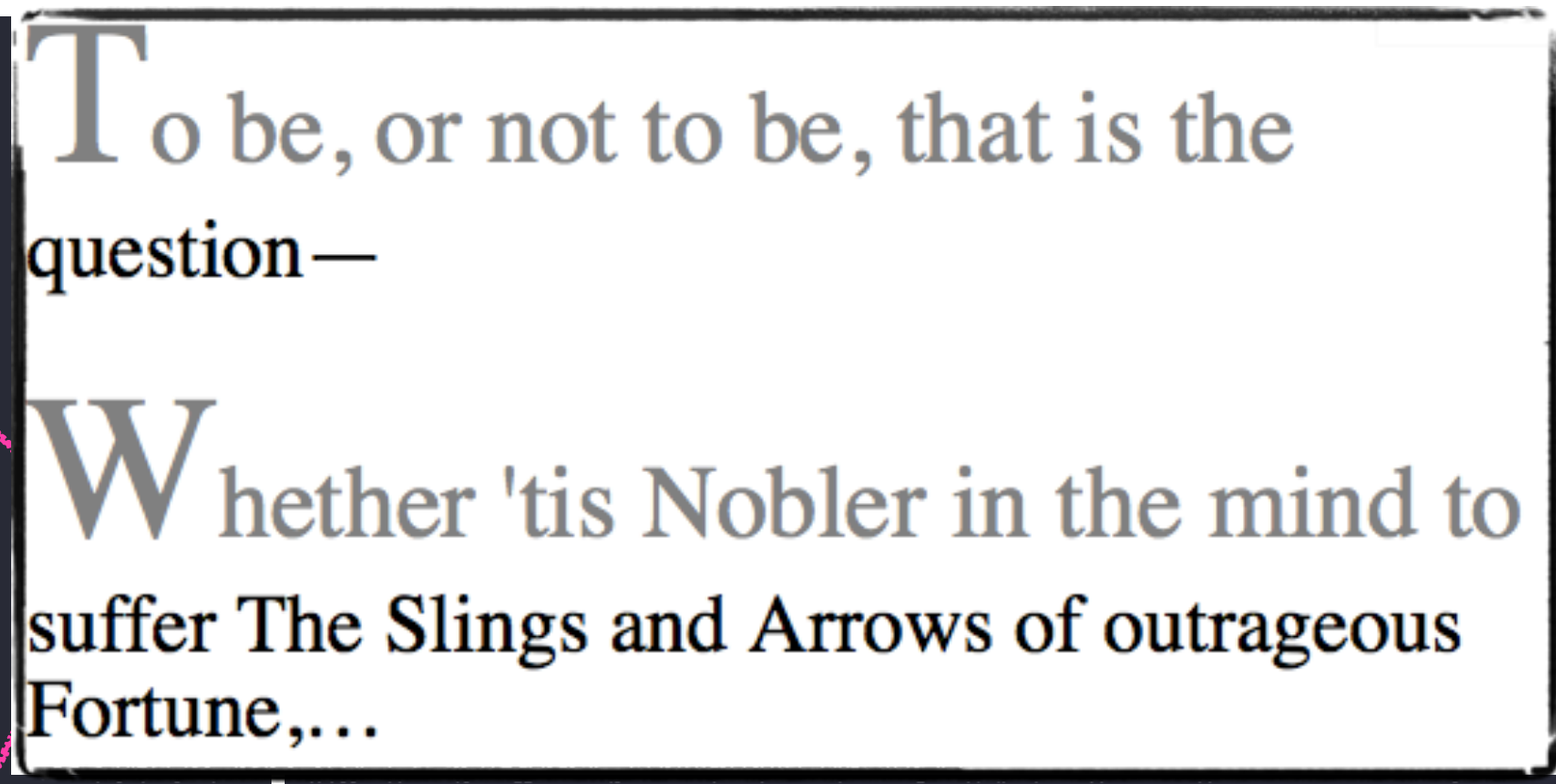


Before and after

`::before` add (cosmetic) content before an element

`::after` add (cosmetic) content after an element

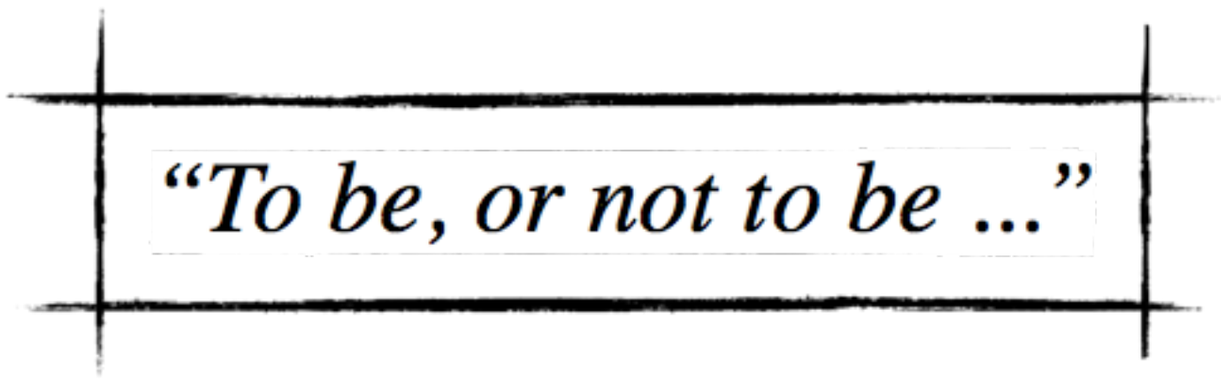
!! pseudo-element is the first child of the selected element

```
<cite>
  To be, or not
  to be …
</cite>
```

```
cite::before {
  content: "\201C";
}
cite::after {
  content: "\201D";
}
```

Canonical example:

add quotation marks to quotes



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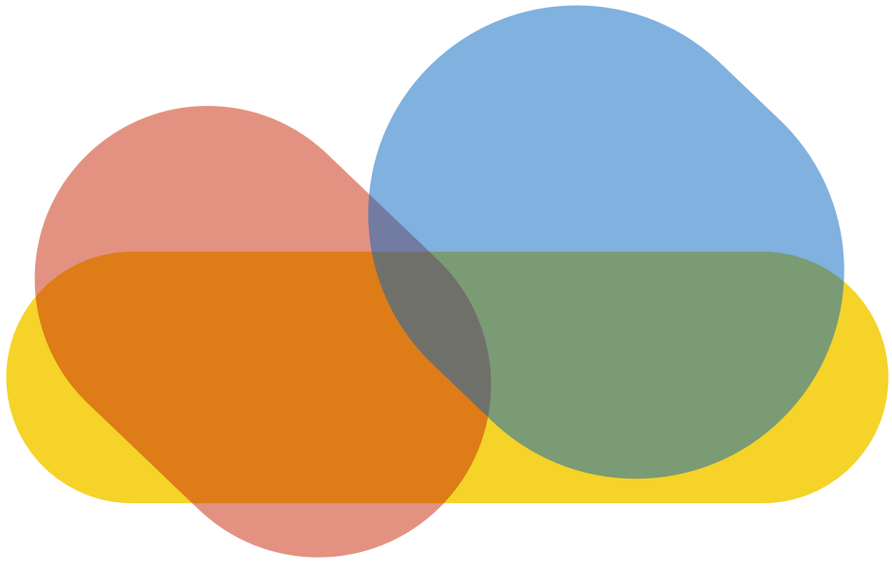
  To be, or not
  to be …
</cite>
```

```
cite::before {
  content: "\201C";
}
cite::after {
  content: "\201D";
}
```

Code [hide]	Glyph	Description	#
U+2013	–	En dash	0903
U+2014	—	Em dash	0904
U+2015	―	Horizontal bar	0905
U+2017	‗	Double low line	0906
U+2018	‘	Left single quotation mark	0907
U+2019	’	Right single quotation mark	0908
U+201A	‚	Single low-9 quotation mark	0909
U+201B	‛	Single high-reversed-9 quotation mark	0910
U+201C	“	Left double quotation mark	0911
U+201D	”	Right double quotation mark	0912

unicode

Before and after




```
.cloud { … }
```

A rectangle with rounded edges.

```
.cloud::before { … }
```

A rectangle with rounded edges that is rotated 33 degrees and moved slightly up and to the right of its parent.

```
.cloud::after { … }
```

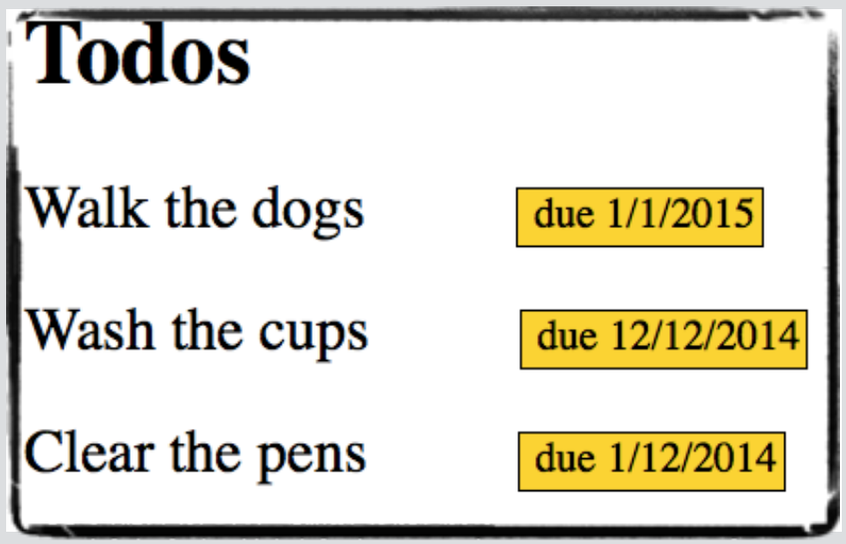
A rectangle with rounded edges that is rotated 33 degrees and moved up and to the right of its parent.

Data in CSS

CSS & data (one way)

CSS does not only describe the style, it can carry data too.

```
<main>
  <h2>Todos</h2>
  <p id="t1">Walk the dogs</p>
  <p id="t2">Wash the cups</p>
  <p id="t3">Clear the pens</p>
</main>
```




```
p::after {
  background-color: gold;
  border: 1px solid;
  font-size: 70%;
  padding: 2px;
  margin-left: 50px;
}

p#t1::after {
  content: " due 1/1/2015";
}

p#t2::after {
  content: " due 12/12/2014";
}

p#t3::after {
  content: " due 1/12/2014";
}
```

CSS & data (one way)

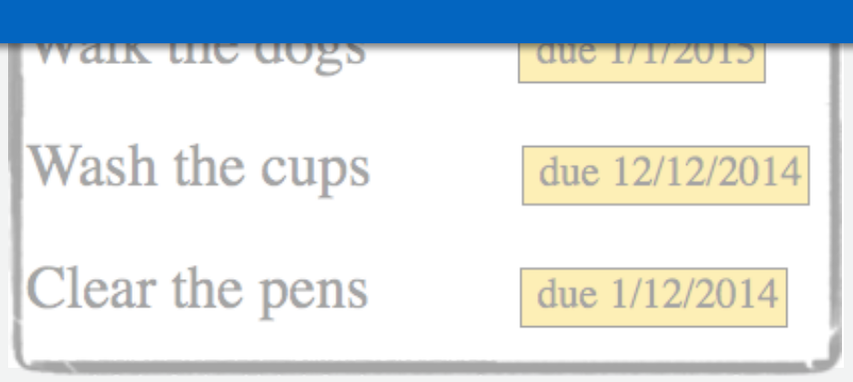
CSS does not only describe the style, it can carry data too.

```
<main>
  <h2>Todos</h2>
```

```
p::after {
  background-color: gold;
  border: 1px solid;
```

Issues:

1. Data is **distributed** across HTML and CSS files.
2. CSS is conventionally not used to store data.
3. **Content is not part of the DOM** (accessibility problem)




```
}

p#t3::after {
  content: " due 1/12/2014";
}
```

CSS & data-* (the preferred way)

CSS can make use of **data stored in HTML elements**.

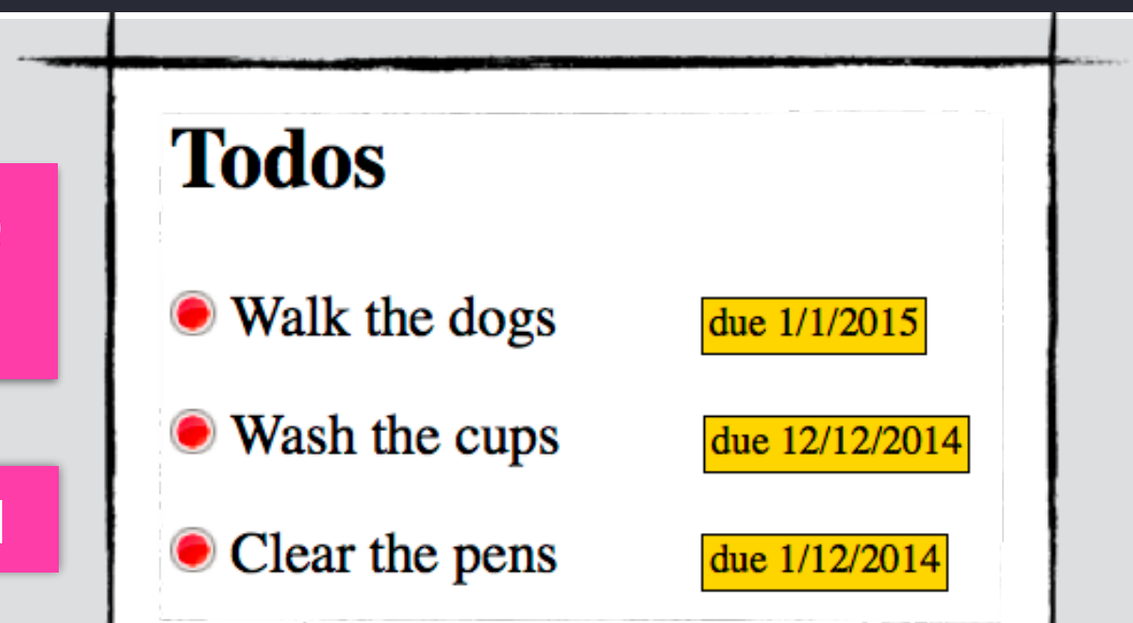
Valid HTML elements can have `data-*` attributes.

```
<main>
  <h2>Todos</h2>
  <p id="t1" data-due="1/1/2015">Walk the dogs</p>
  <p id="t2" data-due="12/12/2014">Wash the cups</p>
  <p id="t3" data-due="1/12/2014">Clear the pens</p>
</main>
```

```
p::after {
  background-color: gold;
  border: 1px solid;
  font-size: 70%;
  padding: 2px;
  margin-left: 50px;
  content: "due " attr(data-due);
}
p::before {
  content: url(http://www.abc.de/dot.png);
}
```

`attr()` retrieves the value of an attribute

content attribute can reference a url



Element positioning with `float`, `position` and `display`

What does this mean?

Property	Description
	defines how an element floats **in the containing**
`float`	**element**; this determines how other elements flow around it
`position`	defines how an element is positioned **in a document**
`display`	defines the **display type** of an element

Elements “flow” by default

HTML 4 terminology

Block-level are surrounded by line-breaks. They can contain block-level and inline elements. The **width is determined by their containing element**.

Examples: `<main>` or `<p>`

Inline elements can be placed within block/inline elements. They can contain other inline elements. The **width is determined by their content**.

Examples: `<span>` or `<a>`

```
<main>
  <p>This is a paragraph containing <a href="#">a link</a></p>
  <p>
    This is another paragraph
    <span> with a span and <a href="#">a link in the span</a> </span>
  </p>
</main>
```

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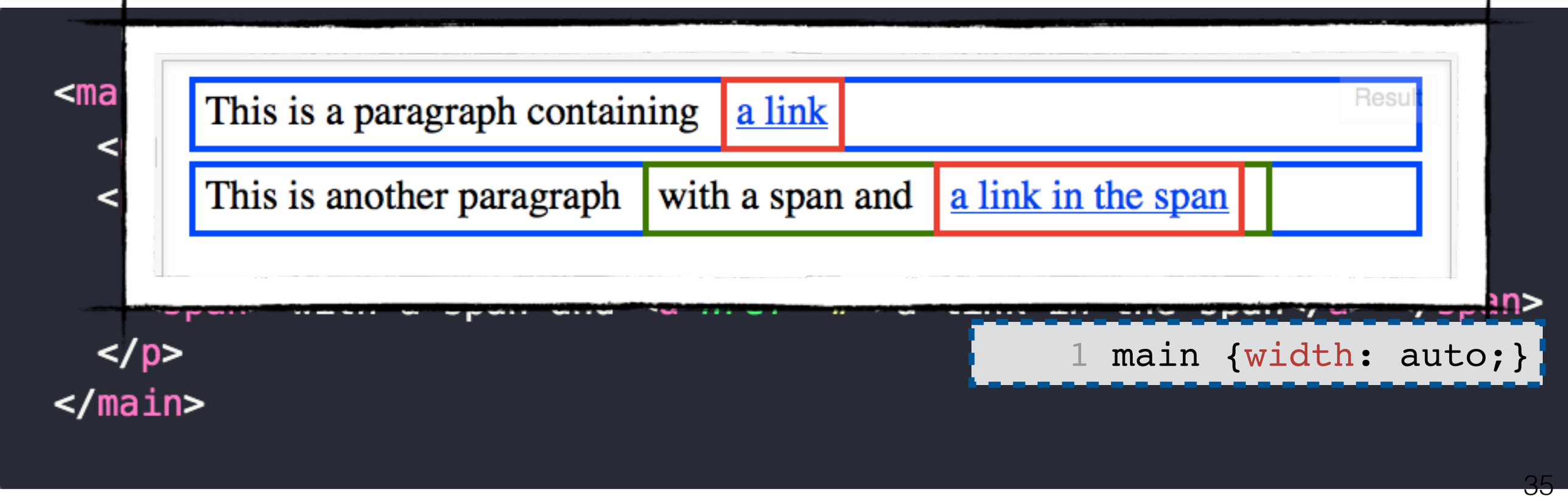

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Examples: `<span>` or `<a>`

```
<ma
  <
  <
  </p>
</main>
```

This is a paragraph containing a link

This is another paragraph with a span and a link in the span

Result

an>

```
1 main {width: 400px;}
```

Taking elements out of the flow

`float:left` (or **`:right`**) takes an element out of the flow; it is moved to the leftmost (or rightmost) possible position **in the containing element** —either the element edge or another float.

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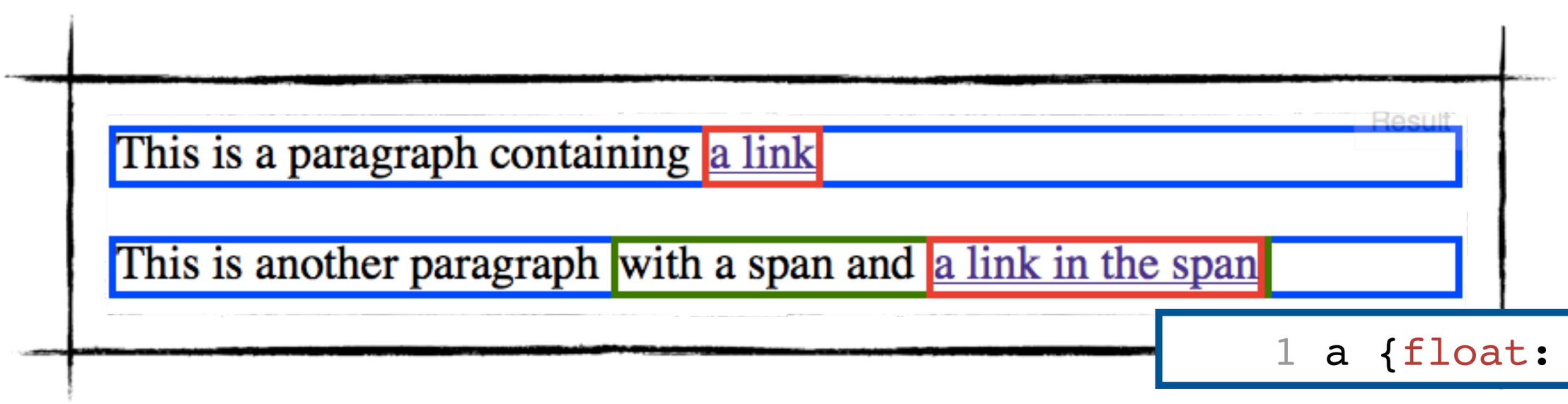

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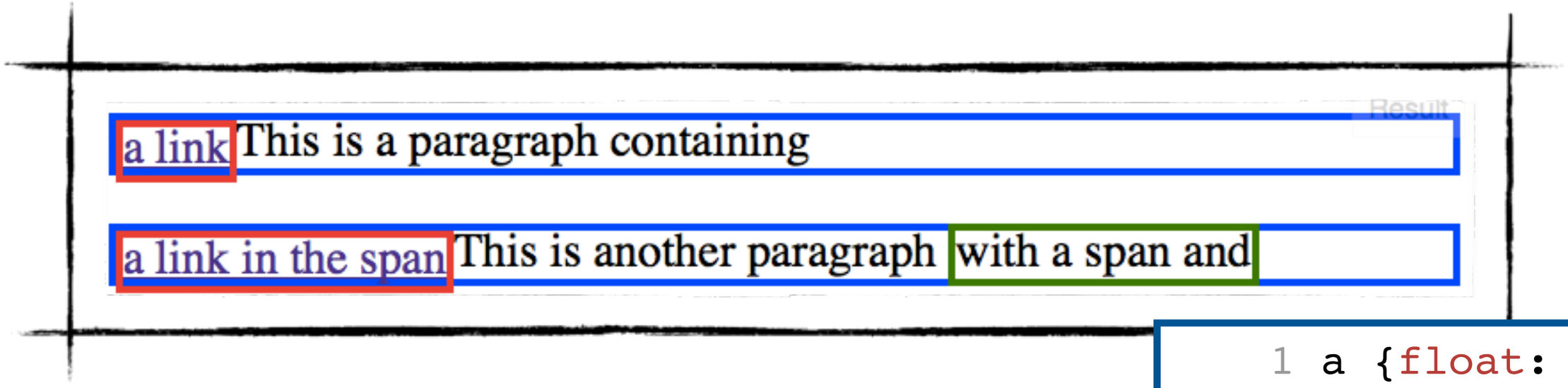

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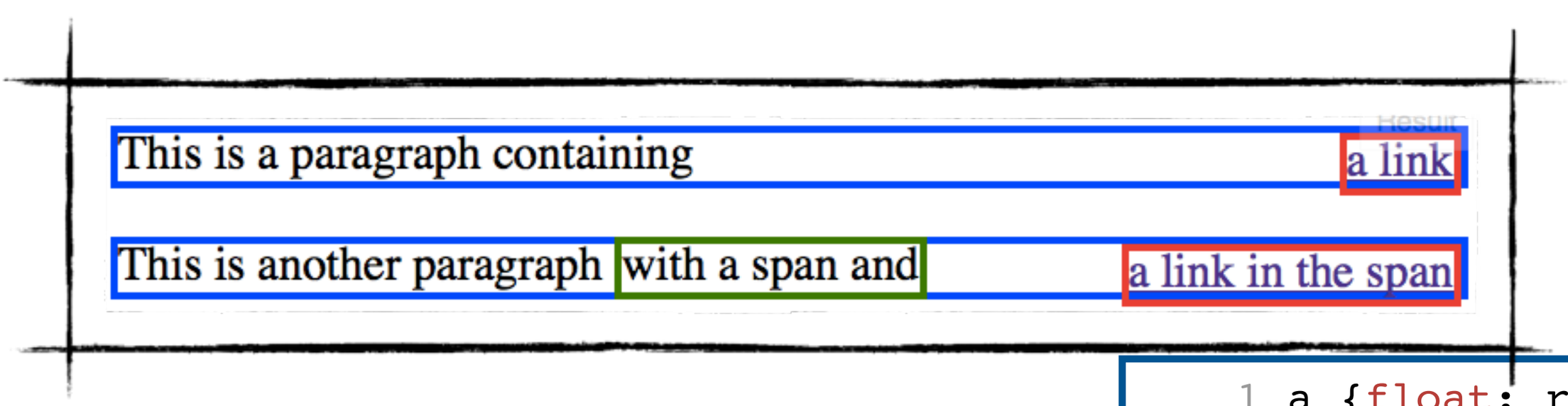
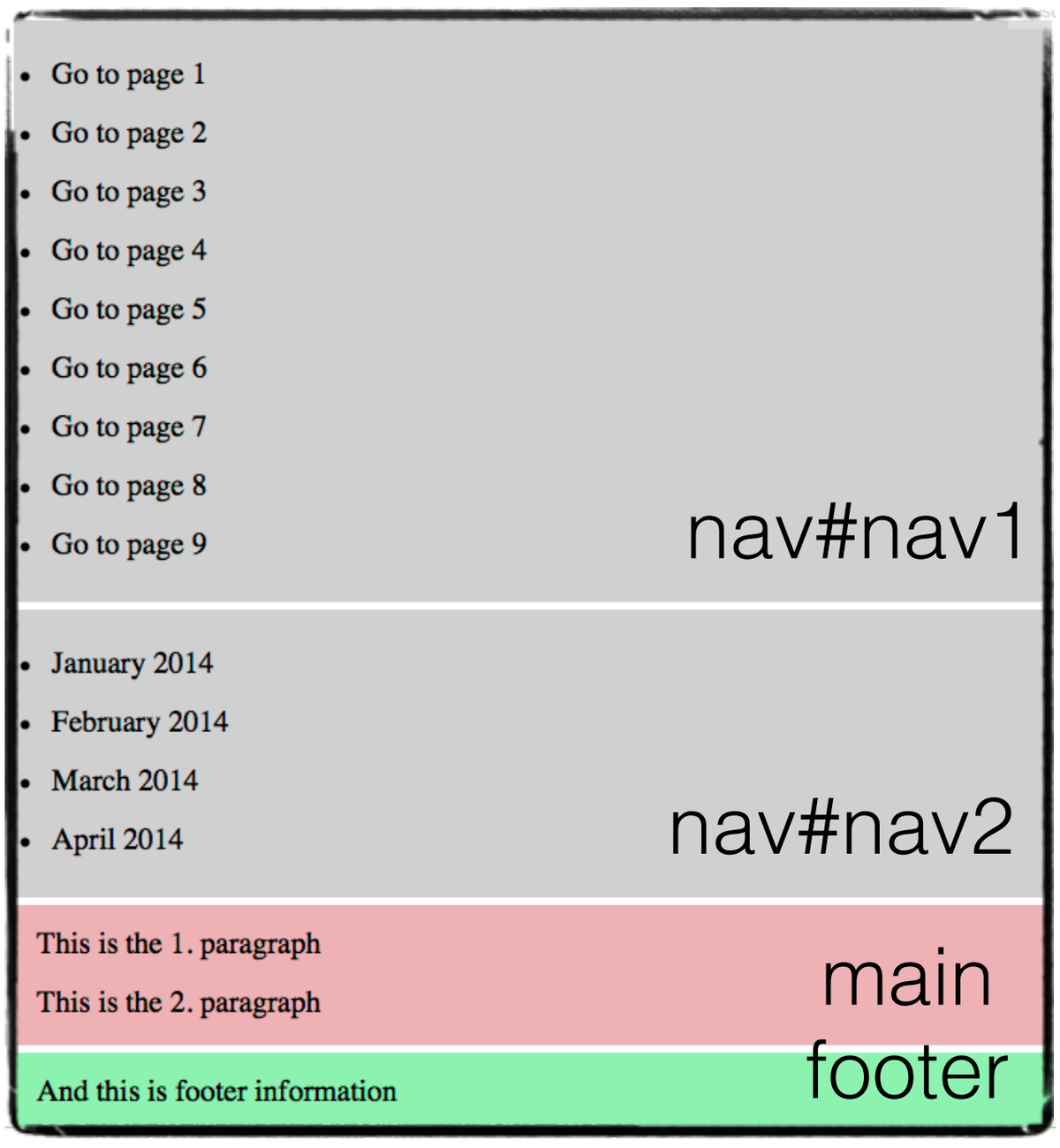



```
1 a {float: right;}
```

Resetting the flow with `clear`

Canonical example: **adding sidebars** to a layout



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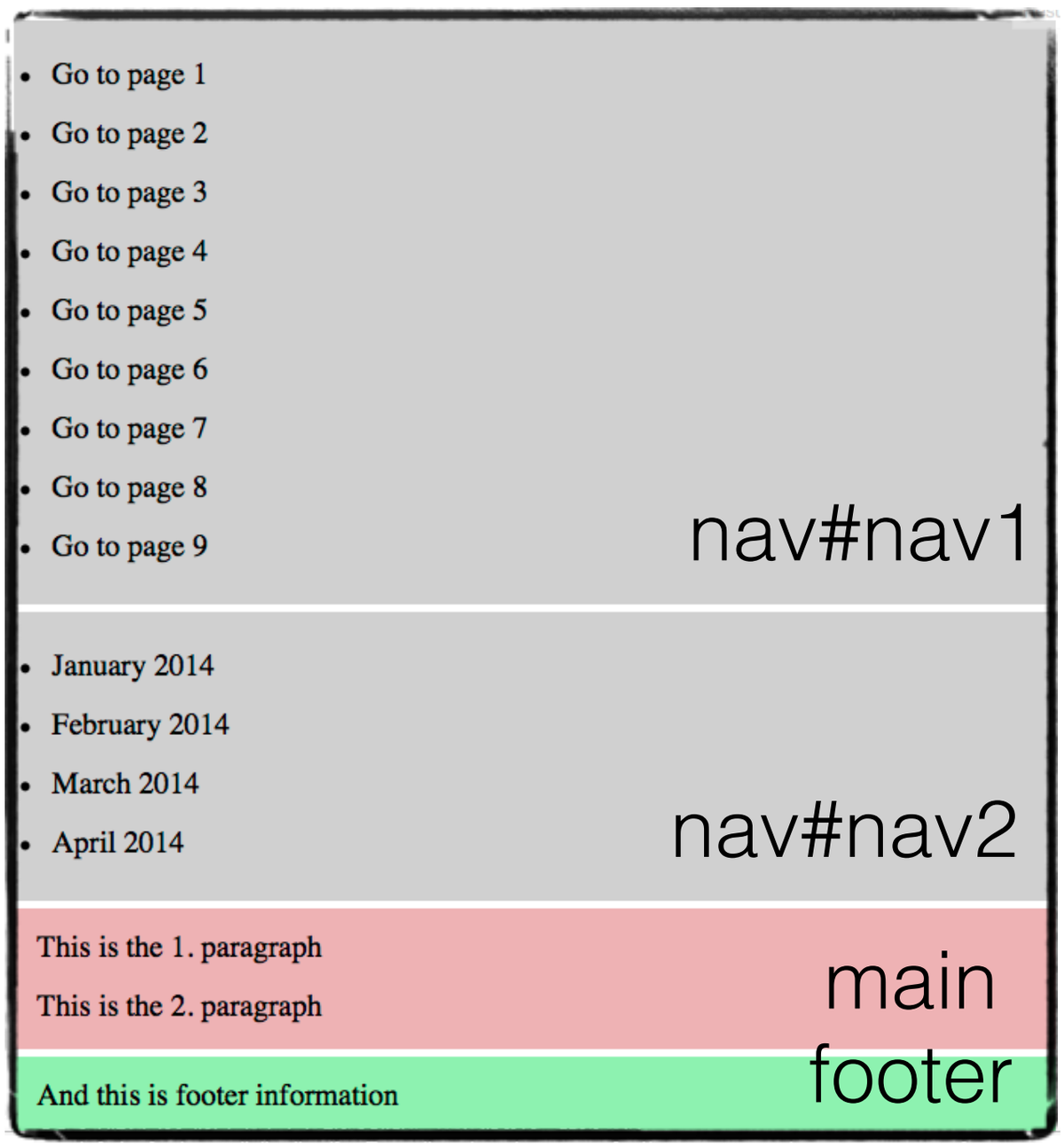


```
1 #nav1 {float: right;}
```

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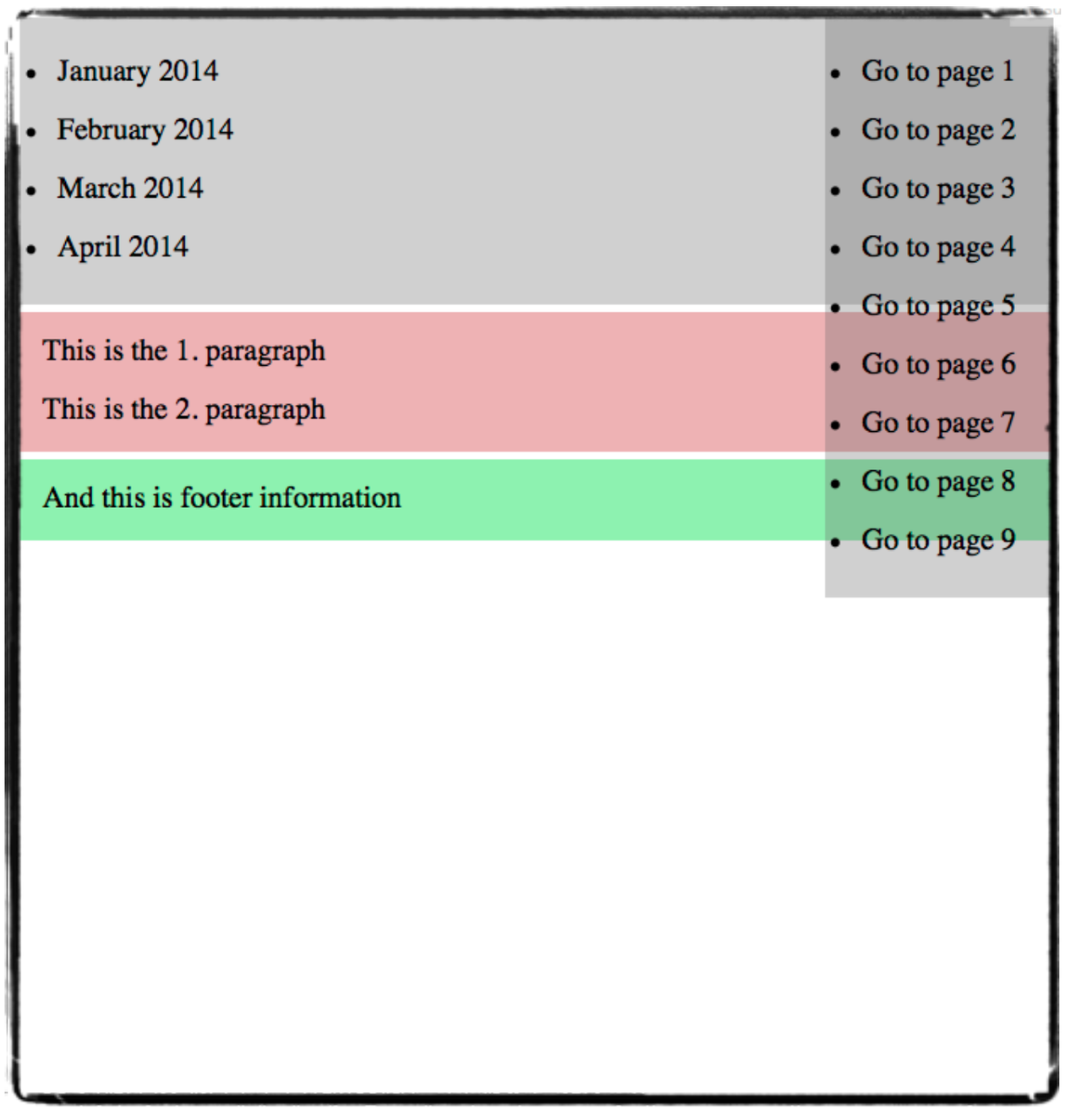


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```

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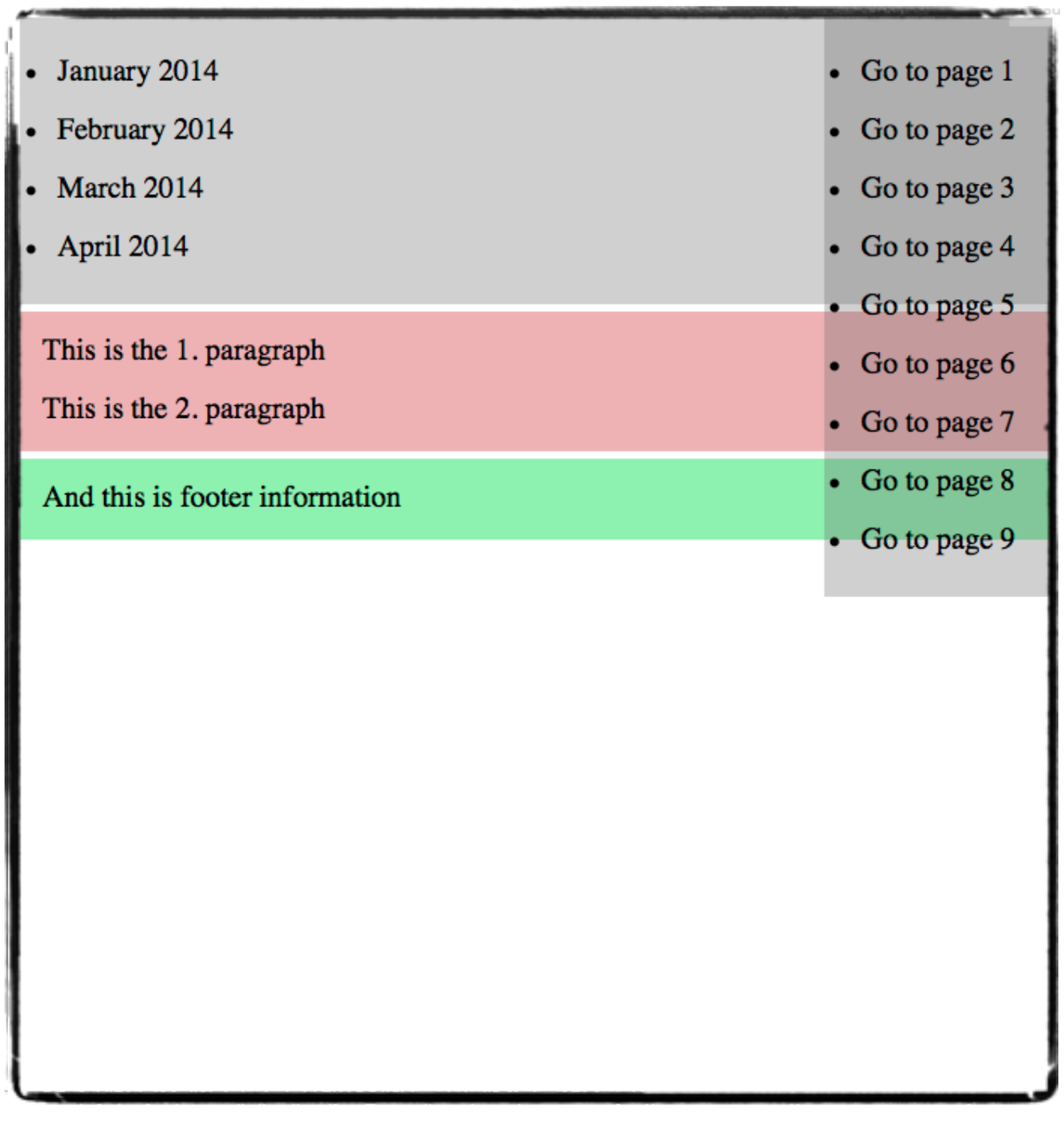


```
1 #nav1 {float: right;}
2 #nav2 {float: left;}
```

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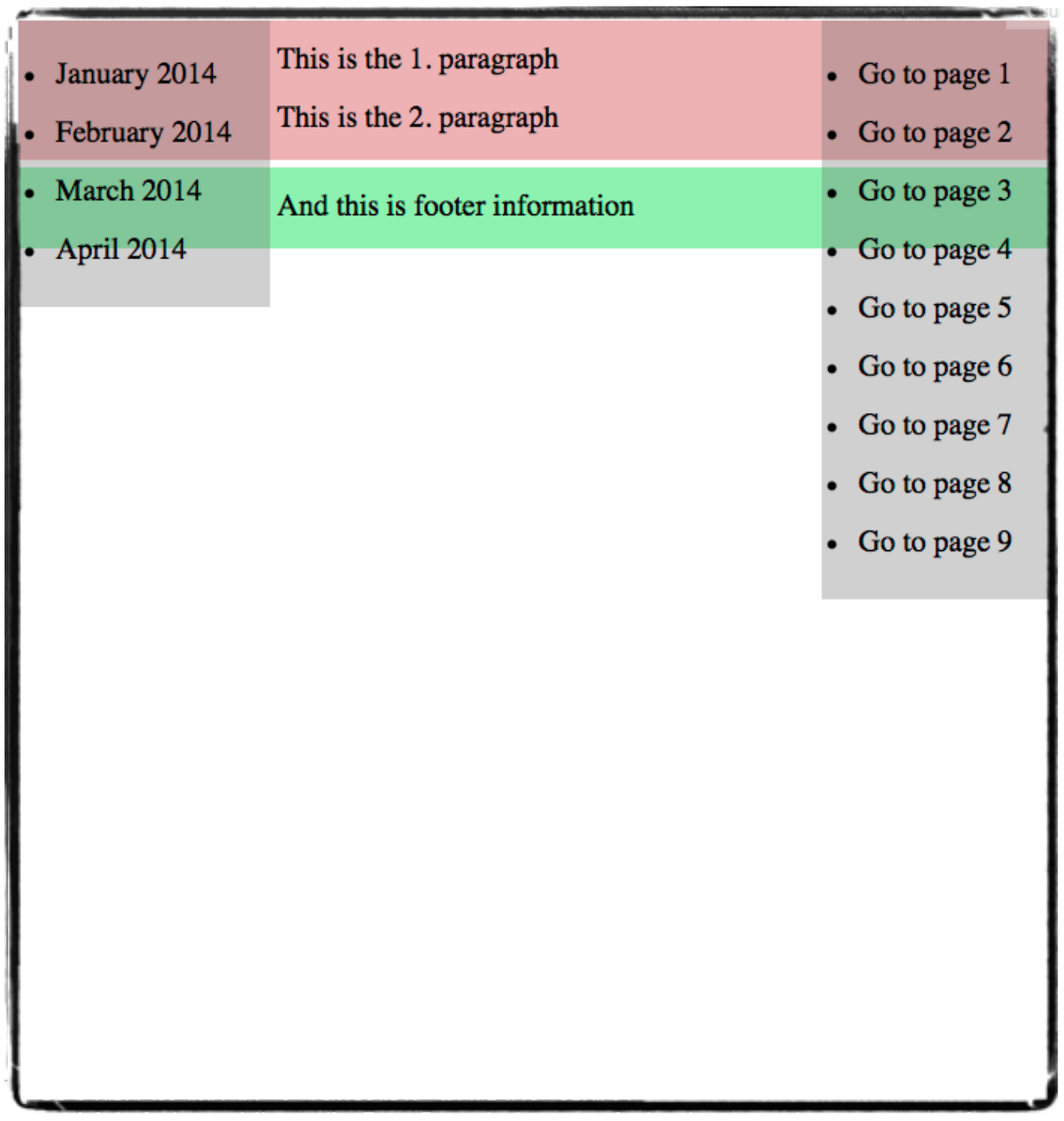
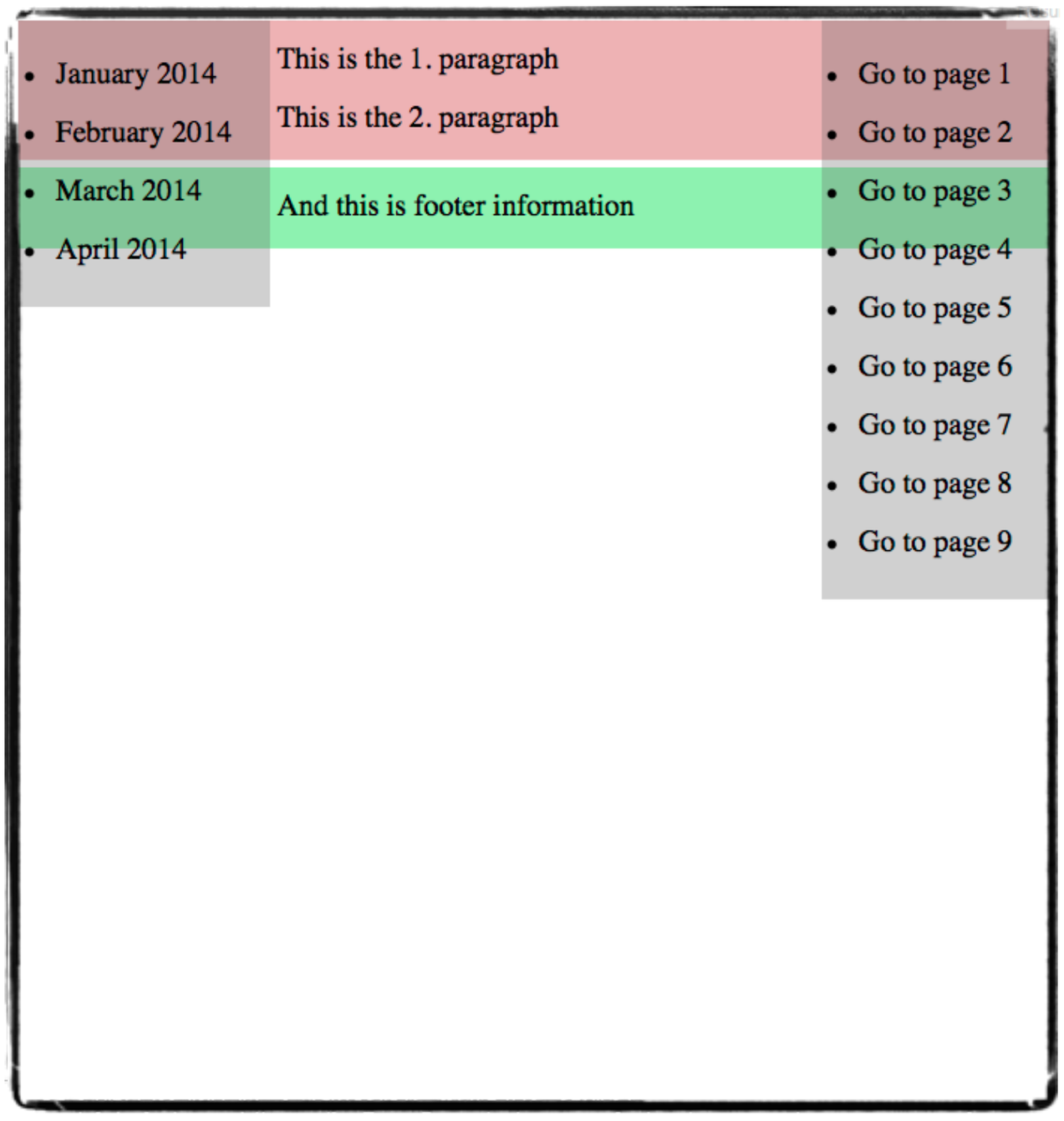



```
1 #nav1 {float: right;}
2 #nav2 {float: left;}
```

Resetting the flow with `clear`

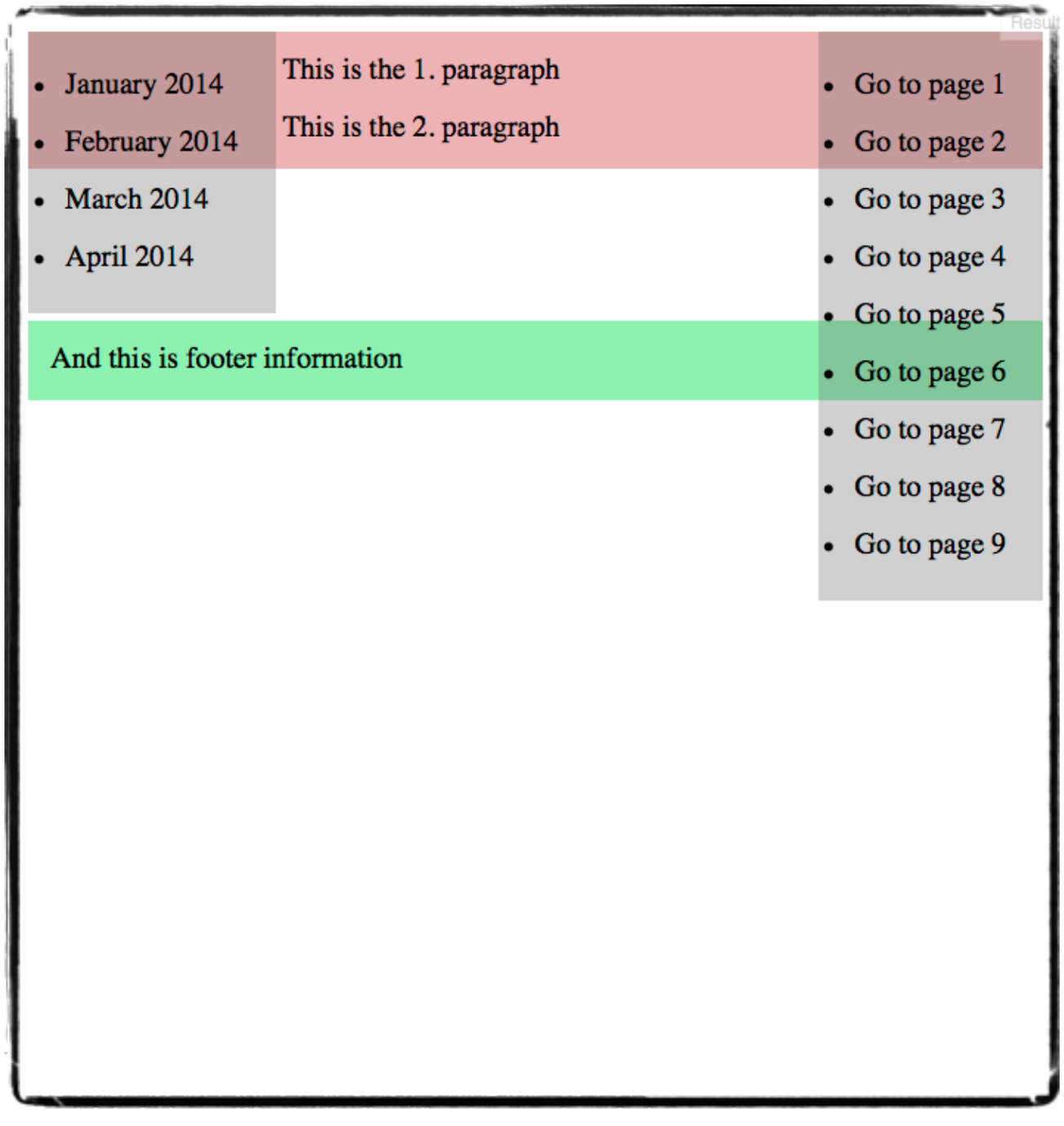
Canonical example: **adding sidebars** to a layout




```
1 #nav1 {float: right;}
2 #nav2 {float: left;}
3 footer{clear: left;}
```

Resetting the flow with `clear`

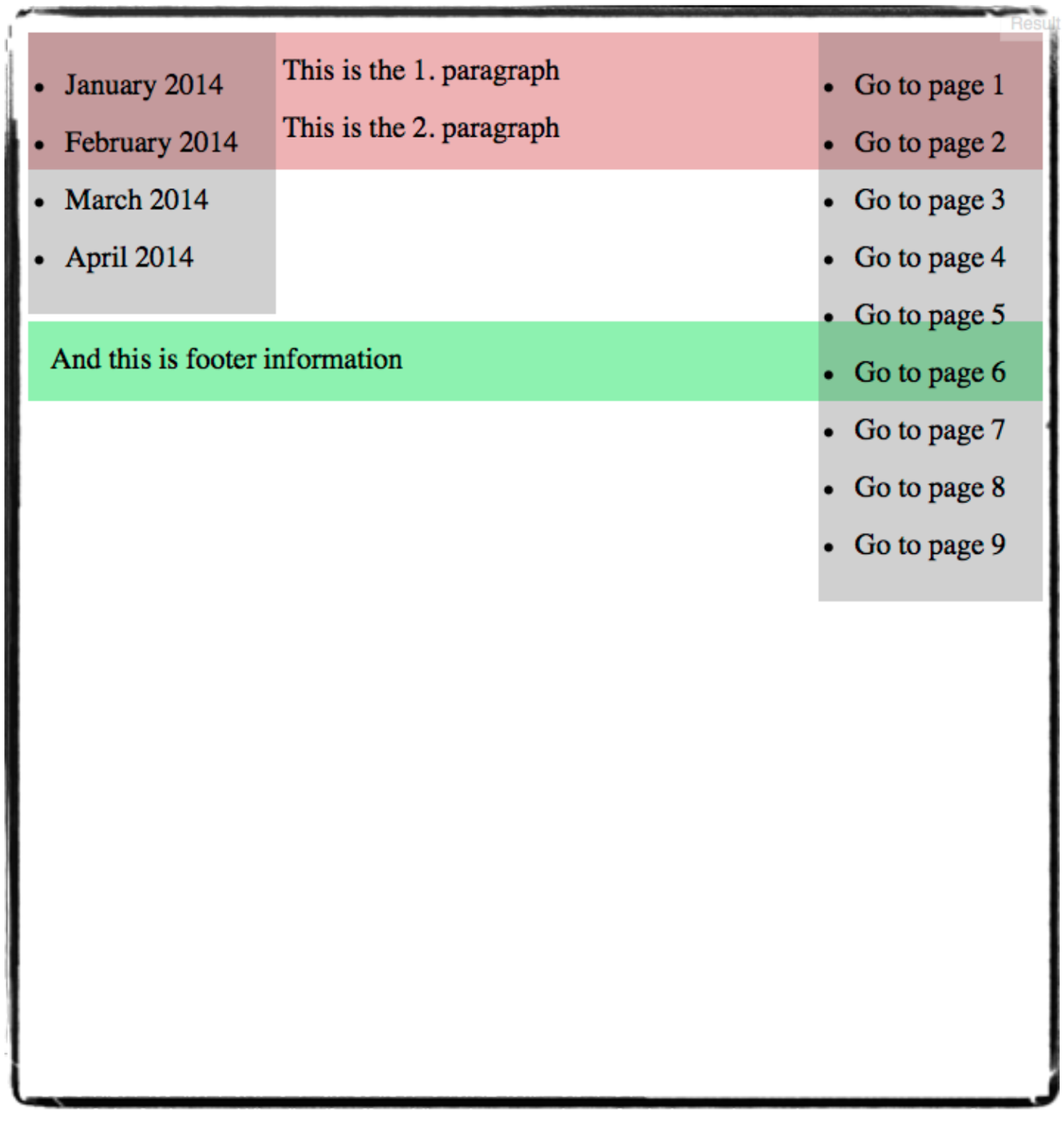
Canonical example: **adding sidebars** to a layout




```
1 #nav1 {float: right;}
2 #nav2 {float: left;}
3 footer{clear: left;}
```

Resetting the flow with `clear`

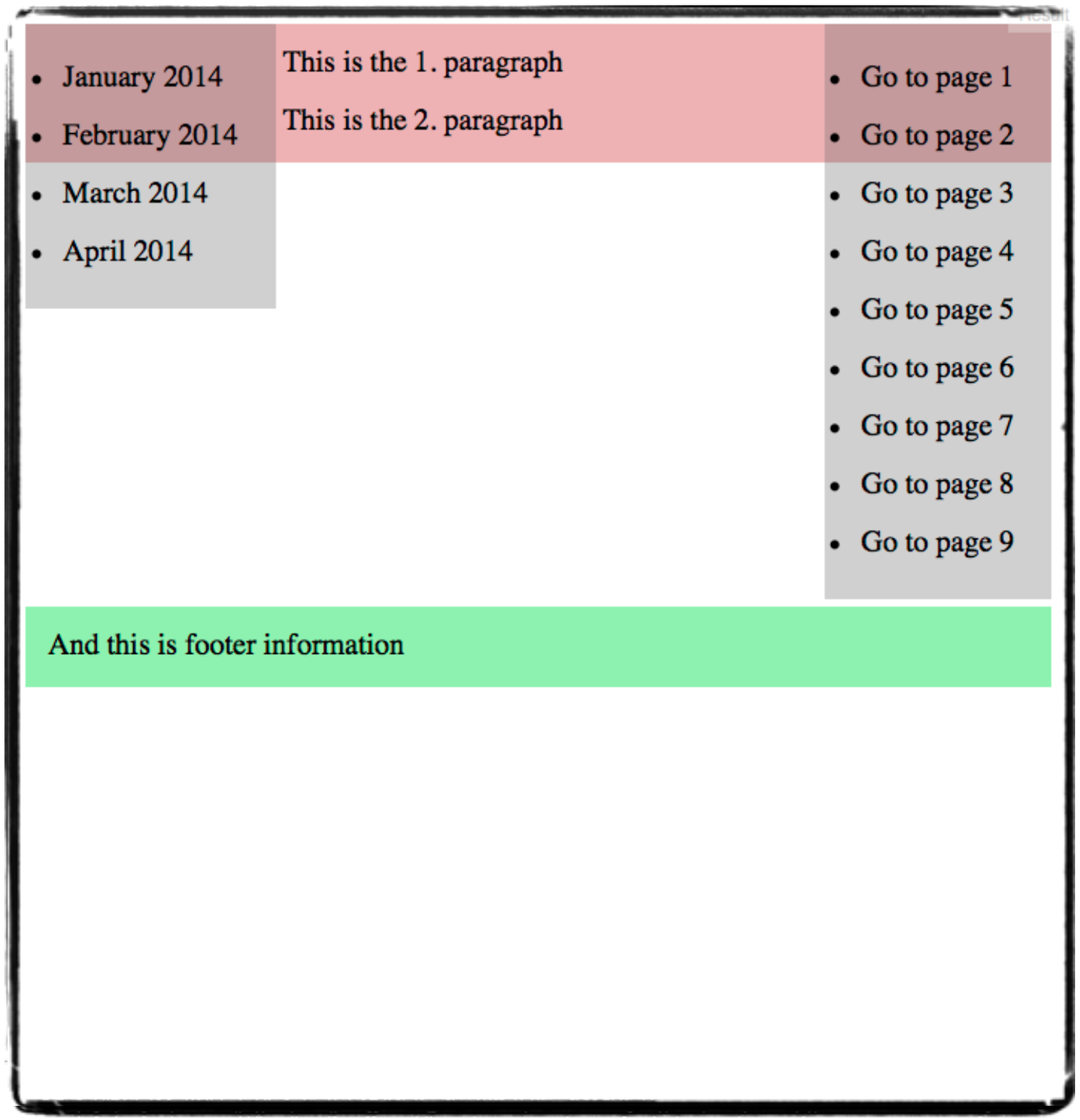
Canonical example: **adding sidebars** to a layout




```
1 #nav1 {float: right;}
2 #nav2 {float: left;}
3 footer{clear: left;}
4 footer{clear: right;}
```

Resetting the flow with `clear`

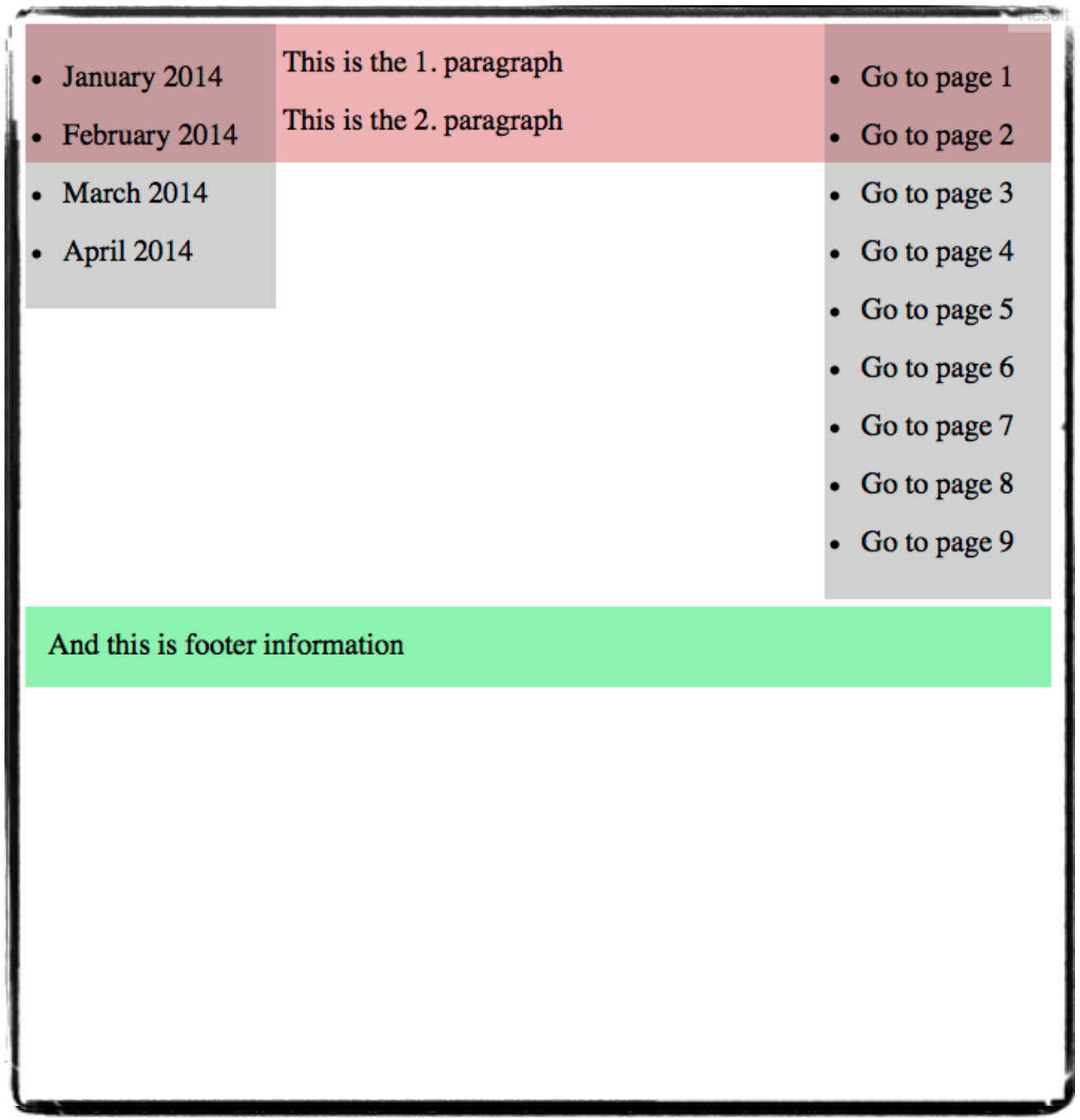
Canonical example: **adding sidebars** to a layout




```
1 #nav1 {float: right;}
2 #nav2 {float: left;}
3 footer{clear: left;}
4 footer{clear: right;}
```

Resetting the flow with `clear`

Canonical example: **adding sidebars** to a layout




```
1 #nav1 {float: right;}
2 #nav2 {float: left;}
3 footer{clear: left;}
4 footer{clear: right;}
```

```
3 footer{clear: both;}
```

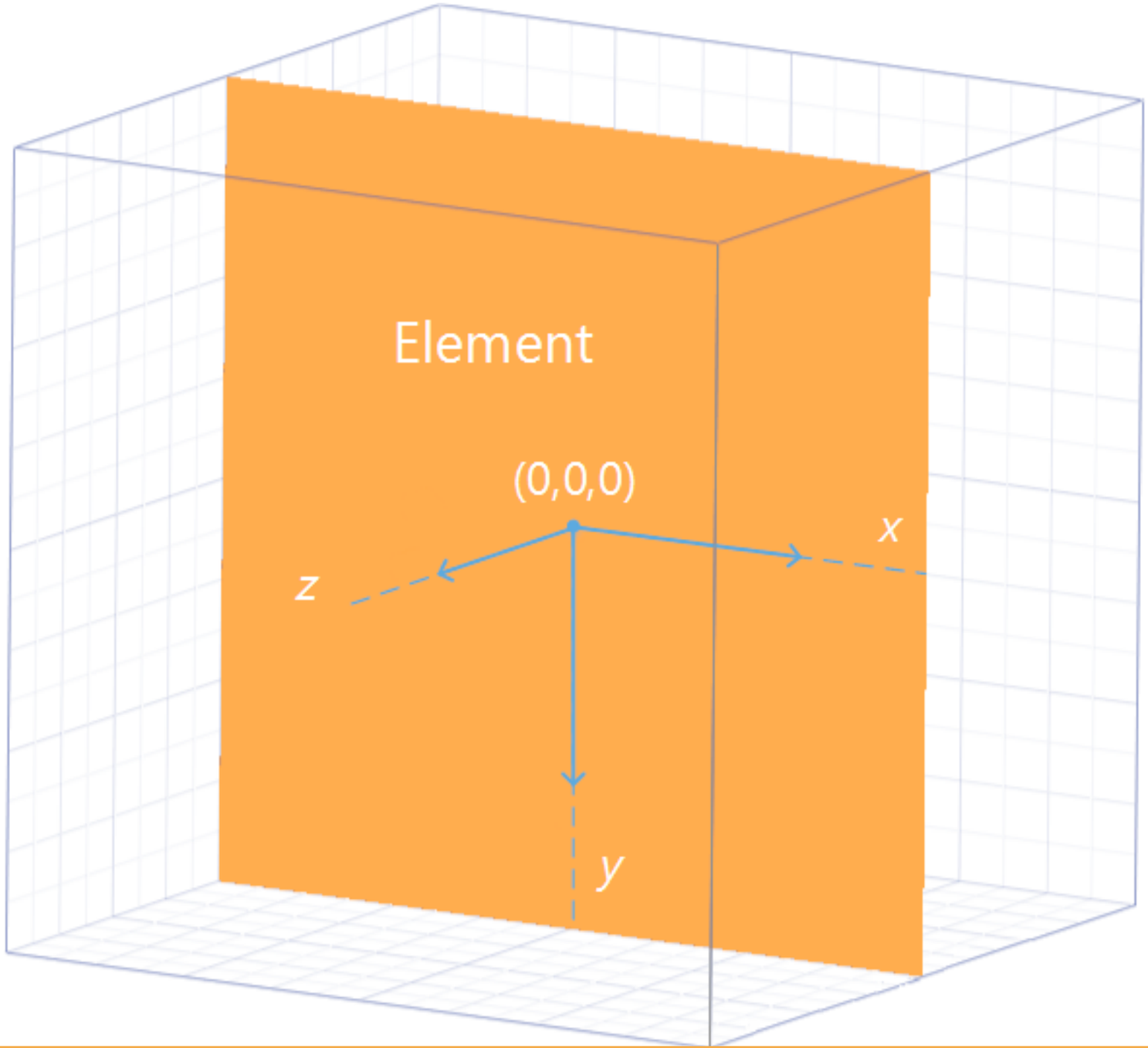
can be used instead

Fine-grained movement: `position`

`position` enables elements to be moved around in any direction (up/down/left/right) by absolute or relative units.

Property	Description
`position:static`	the default
`position:relative`	the element is adjusted on the fly, other elements are not affected
`position:absolute`	element is taken out of the normal flow (no space is reserved for it)
`position:fixed`	similar to absolute, but fixed to the viewport (area currently being viewed)
`position:sticky`	inbetween relative and fixed (we do not consider it further)

CSS coordinate system



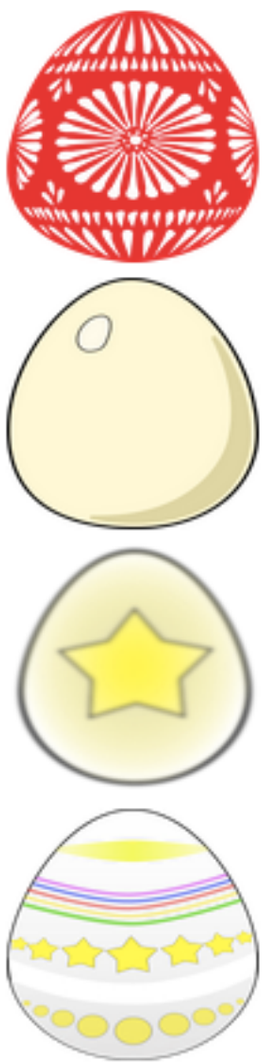
y extends downward. **x** extends to the right.

Image source: http://msdn.microsoft.com/en-us/library/ie/jj665791%28v=vs.85%29.aspx

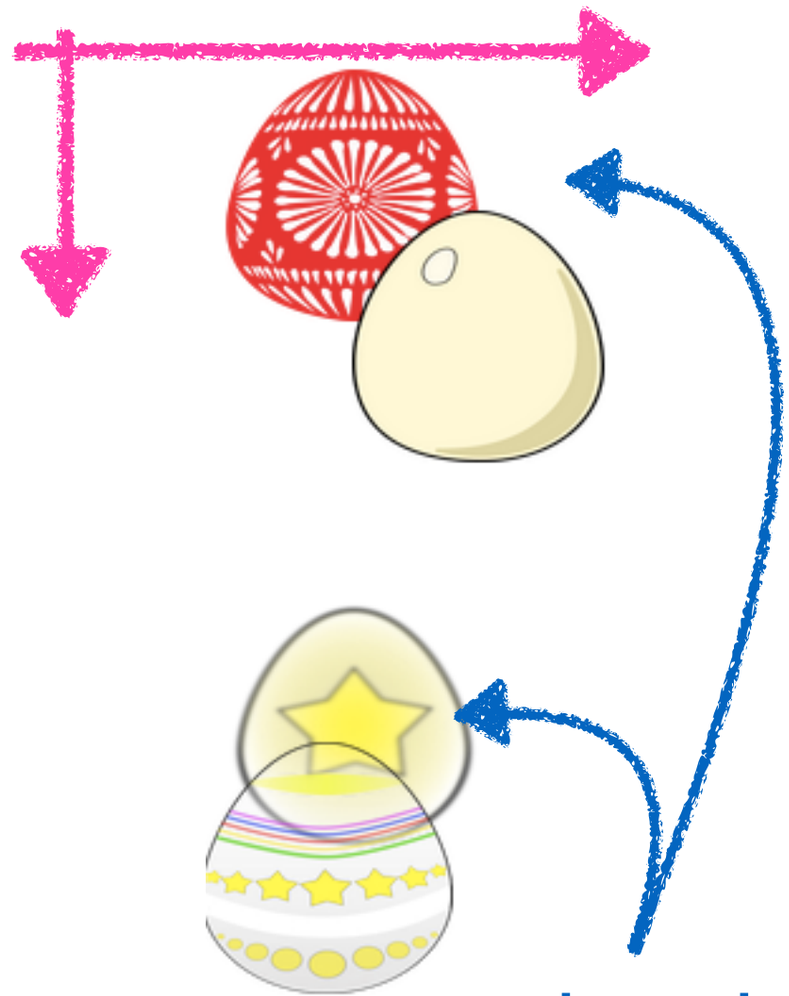
position:relative

The element is adjusted on the fly, other elements are **not** affected.

The movement is **relative** to its original position.



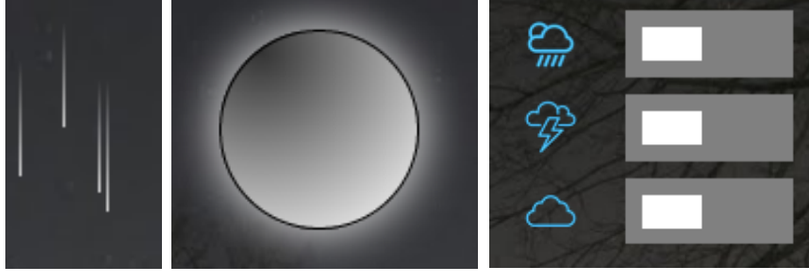

```
#egg2 {
  position: relative;
  bottom: 20px;
  left: 20px;
}

#egg4 {
  position: relative;
  bottom: 50px;
  right: 10px;
}
```



Distance the element's bottom edge moves *above* its position.

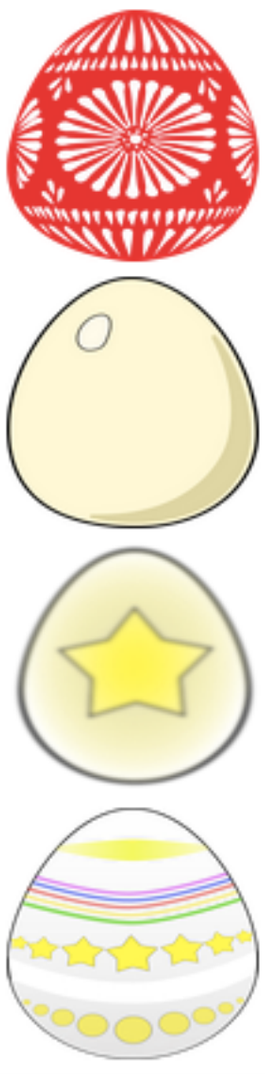
Distance the element's left edge is moved to the *right* from its position.

position:absolute



The element is taken out of the normal flow (no space is reserved).

The positioning is relative to nearest ancestor or the window.

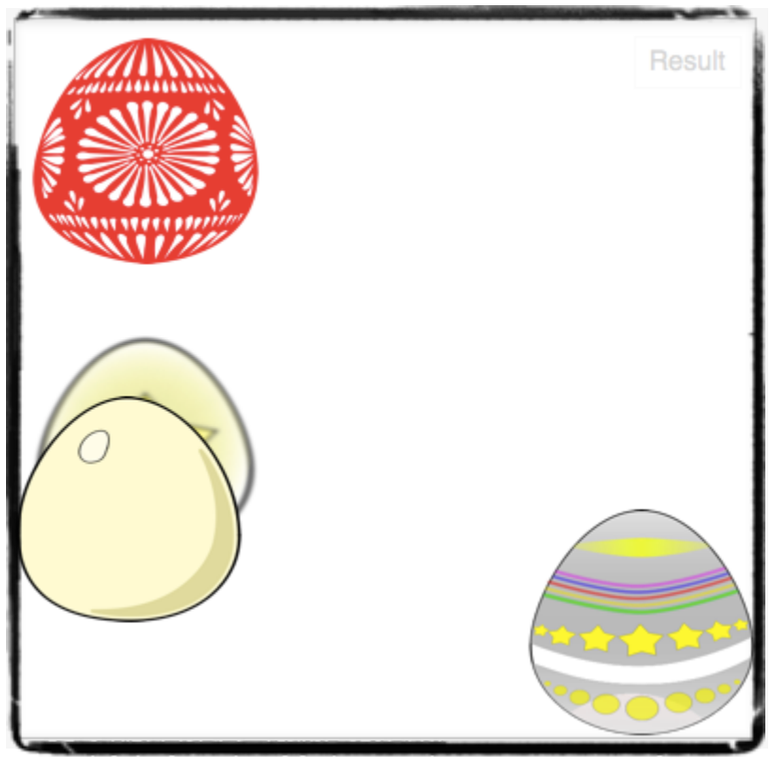


id="egg1"

id="egg4"

```
#egg2 {
  position: absolute;
  bottom: 50px;
  left: 0px;
}

#egg4 {
  position: absolute;
  bottom: 0px;
  right: 0px;
}
```

window



Distance between the element's bottom edge and that of its containing block.

Distance between the element's left edge and that of its containing block.

`position:fixed`

Similar to `absolute`, but the containing "element" is the viewport.

Elements with `position:fixed` are always visible.

area of the document visible in the browser

```
#swingingBoards {
  text-align: center;
  position: fixed;
  /*top and left determine where fixed position is*/
  top: 50%;
  left: 40%;
}
```

display

`display:inline`	element rendered with an inline element box
`display:block`	element rendered with a block element box
`display:none`	element (and its descendants) are hidden from view; no space is reserved in the layout

`display:inline-block` block element box that flows as inline el.

display

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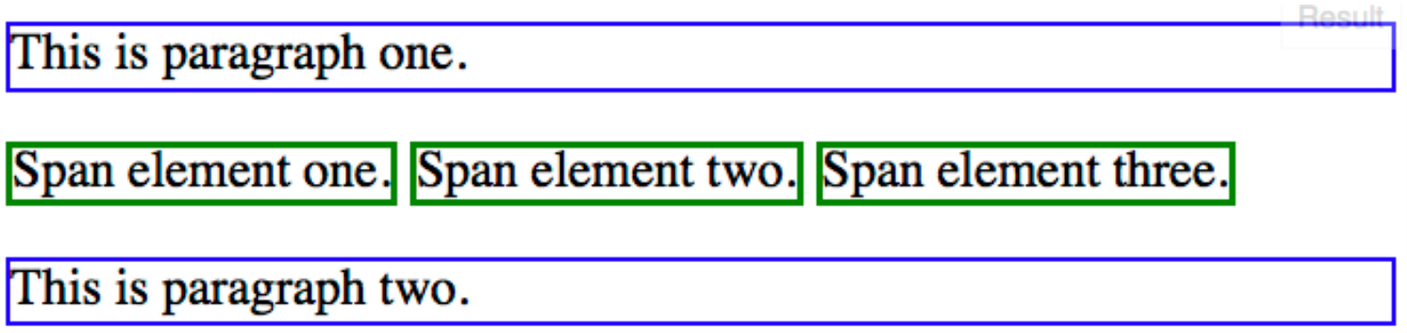

display

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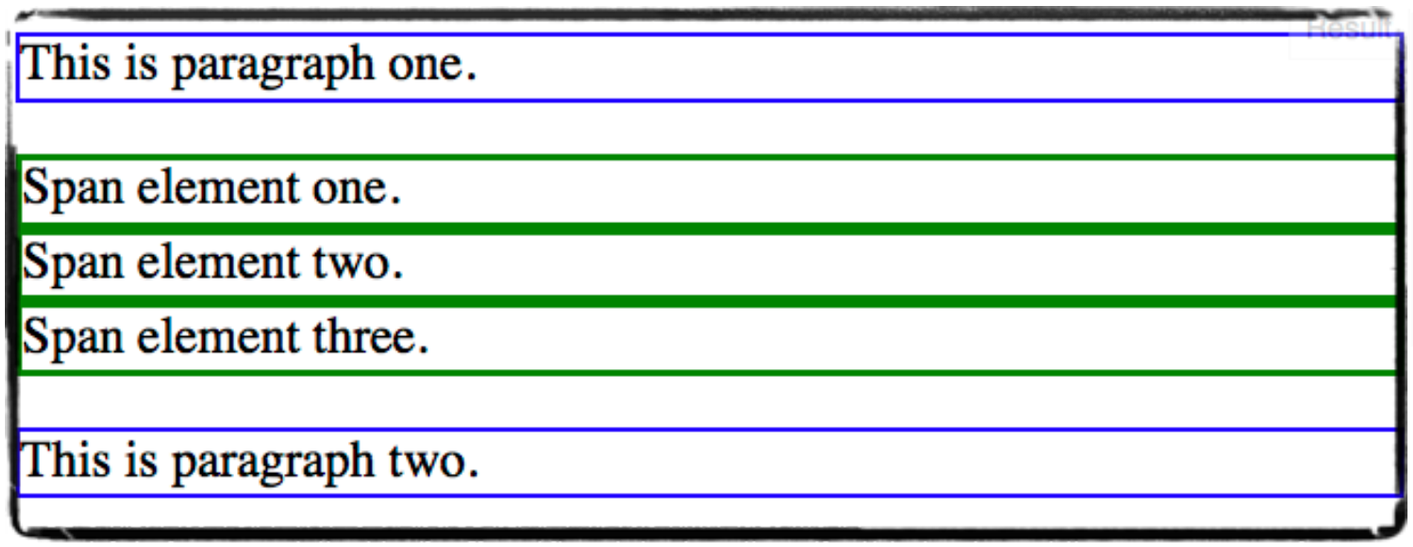
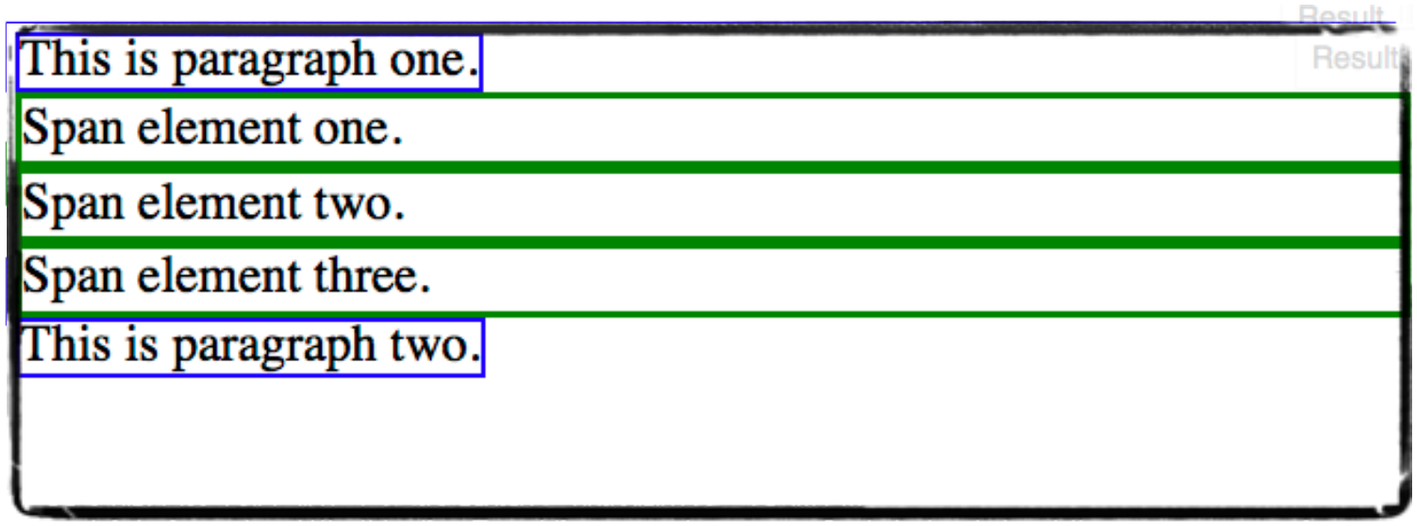



```
1 span {display: block; }
```

display

`display:inline`	element rendered with an inline element box
`display:block`	element rendered with a block element box
`display:none`	element (and its descendants) are hidden from view; no space is reserved in the layout

`display:inline-block` block element box that flows as inline el.

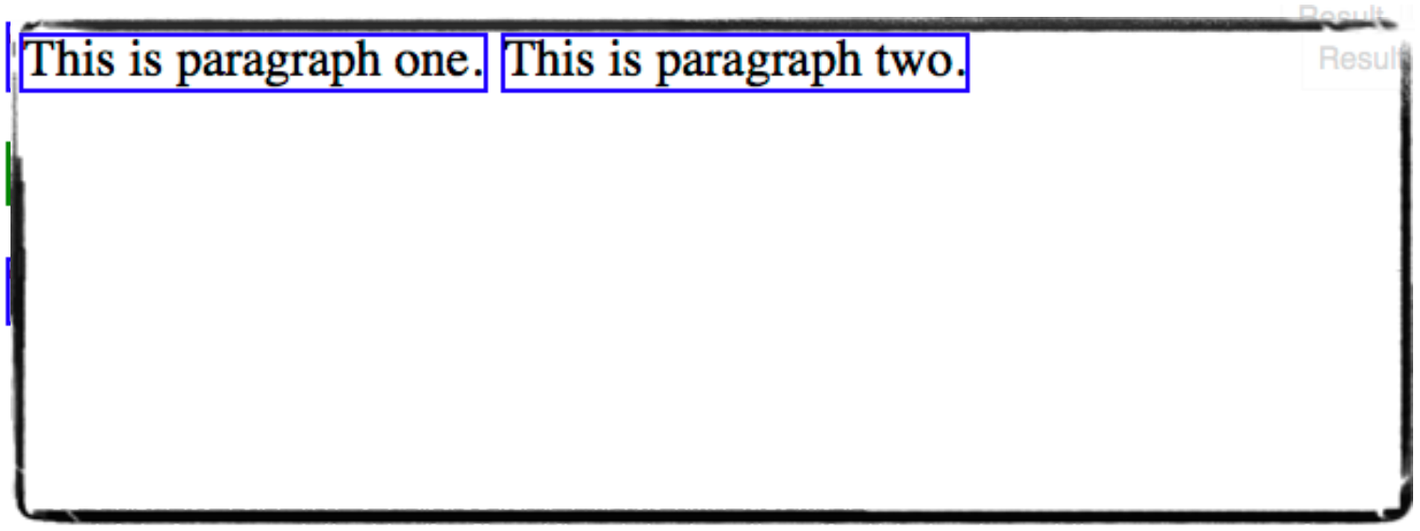



```
1 span {display: block; }
2 p    {display: inline;}
```

display

`display:inline`	element rendered with an inline element box
`display:block`	element rendered with a block element box
`display:none`	element (and its descendants) are hidden from view; no space is reserved in the layout

`display:inline-block` block element box that flows as inline el.




```
1 span {display: block; }
2 p    {display: inline;}
3 span {display: none;}
```

CSS media queries

@flickr: pchow98

Not just one device but many…

- Different devices should be served different styles
  - **Printing**: print the essentials only (no ads, sidebars, in black and white)
  - **Viewing** on a **small screen**: remove non-essential information
  - **Viewing** on a **large screen**: present all information
  - **Text-to-speech** devices: remove non-essential information
- CSS media queries enable the use of **device-dependent stylesheets**

HTML: write once
CSS: write once per device

Four device types

Value	Description
`media all`	Suitable for all device types.
`media print`	Suitable for documents in print preview.
`media screen`	Suitable for screens.
`media speech`	Suitable for speech synthesizers.

at-rules starting with @

responsive design mode

Media queries can be complex

```
<link
  rel="stylesheet"
  media="screen and (min-width: 800px),
    (min-width: 3000px)"
  href="large-device.css"
/>
...
```

“,”: logical or

dedicated CSS files

```
<style>
  @media print {
    body {
      color: black !important;
      width: 100%;
    }
  }
  @media screen and (max-width: 300px) {
    #sidebar {
      display: none;
    }
  }
</style>
```

rules for different devices in one file

when printing, use black and white

hide the sidebar for small devices

Animations and transitions

Rendering engines

(layout engine, browser engine)

Engine	Browsers
`Gecko`	Firefox
`Trident`	Internet Explorer
`EdgeHTML`	Microsoft Edge
`WebKit`	Safari, older versions of Google Chrome
`Blink`	Google Chrome, Opera

Rendering engines

(layout engine, browser engine)

Engine	Br
`Gecko`	Firefox
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`EdgeHTML`	Microsoft Edge
`WebKit`	Safari, older vers
`Blink`	Google Chrome,

In general …

- CSS styles (states) are defined by the developer, the rendering engine takes care of the transition

- **Animations** consist of:
  - An animation **style** (`linear`, 3 seconds duration, 10 times, etc.)
  - **Keyframes** acting as transition waypoints

- **Transitions** are animations that consist of exactly two states: start and end state

CSS vs. JavaScript animations

- Rendering engines are **optimised** for CSS-based animations
- CSS animations can do much more than animating buttons

Lightning animation

```css
.lightning {
    /* the background-image should be filled with lightning;
    */
    position: absolute;
    width: 100%;
    height: 100%;

    animation: flash ease-out 5s infinite;
}

@keyframes flash {
    /* basic idea: the white div covering the entire screen appears
     * very briefly with varying levels of opacity;
     */
    from { opacity: 0; }
    74% { opacity: 0;}
    75% { background-color: white;  opacity: 0.6; }
    76% { background-color: white;  opacity: 0.2; }
    80% { background-color: white;  opacity: 0.95; }
    82% { opacity: 0; }
    92% { opacity: 0; }
    93% { background-color: white;  opacity: 0.5; }
    94% { background-color: white;  opacity: 0.2; }
    96% { background-color: white;  opacity: 0.9; }
    to  { opacity: 0; }
}
```

animation properties

animation name

Define the states of the animation, the rendering engine does the rest. 0%-100% is one animation cycle.

from = 0%

to = 100%

Moon animation

```
#moon {
    position: absolute;
    left: 60px;
    top: 40px;
    border-radius: 50%; /* making it round */
    height: 100px;
    width: 100px;
    border: 1px solid black;

    background: radial-gradient(circle at 20px 10px, #333, #fff);
    box-shadow: 0 0 25px #fff;
    animation: flicker 3s infinite;
}

@keyframes flicker {
    0% {
        box-shadow: 0 0 25px #fff;
    }
    25% {
        box-shadow: 0 0 60px #fff;
    }
    50% {
        box-shadow: 0 0 50px #fff;
    }
    90% {
        box-shadow: 0 0 27px #fff;
    }
}
```

animation properties

animation name

Define the states of the animation, the rendering engine does the rest.

Cloud animation

```css
/* simple animation: clouds go from left to right */
@keyframes moveclouds {
    0% {margin-left: -20%;}
    100% {margin-left: 120%;}
}
```

```js
function toggleClouds(e) {
  let clouds = document.getElementById("clouds");

  if (document.getElementById("cloudsCheckbox").checked == false) {
    while (clouds.firstChild) {
      clouds.removeChild(clouds.firstChild);
    }
  } else {
    for (let i = 1; i <= totalNumClouds; i++) {
      let c = document.createElement("div");
      c.classList.add("cloud");
      c.style.top = 50 + getRandomInt(120) + "px";
      c.style.opacity = Math.random();
      c.style.animationDuration = 15 + getRandomInt(20) + "s";
      c.style.animationDelay = -1 * getRandomInt(40) + "s";
      c.style.transform = "scale(" + (0.1 + Math.random()) + ")";
      clouds.appendChild(c);
    }
  }
}
```

Cloud animation

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    0% {margin-left: -20%;}
    100% {margin-left: 120%;}
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  }
}
```

1 cloud = 1 div

Cloud animation

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}
```

1 cloud = 1 div

same partial css for every cloud

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      c.style.transform = "scale(" + (0.1 + Math.random()) + ")";
      clouds.appendChild(c)
    }
  }
}
```

1 cloud = 1 div

same partial css for every cloud

transform property: rotate, skew, scale, translate

Cloud animation

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    0% {margin-left: -20%;}
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      c.style.opacity = Math.random();
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      c.style.animationDelay = -1 * getRandomInt(40) + "s";
      c.style.transform = "scale(" + (0.1 + Math.random()) + ")";
      clouds.appendChild(c)
    }
  }
}
```

1 cloud = 1 div

same partial css for every cloud

Every cloud gets animation specific property values (speed, opacity, size, starting location)

transform property: rotate, skew, scale, translate

Cloud animation

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      c.style.animationDelay = -1 * getRandomInt(40) + "s";
      c.style.transform = "scale(" + (0.1 + Math.random()) + ")";
      clouds.appendChild(c)
    }
  }
}
```

1 cloud = 1 div

same partial css for every cloud

Every cloud gets animation specific property values (speed, opacity, size, starting location)

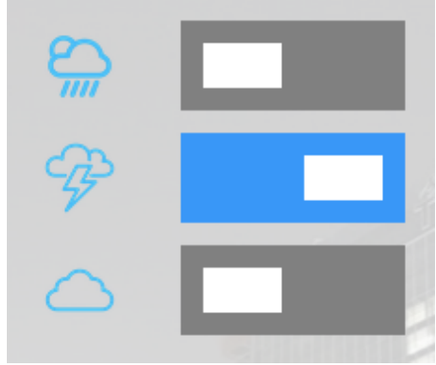
transform property: rotate, skew, scale, translate

Beware: `animation-delay` (CSS) vs. `animationDelay` (JavaScript)!

CSS animation control

Property	Despcription
`animation-iteration-count`	Number of times an animation is executed (default: 1); the value is either a positive number or `infinite`.
`animation-direction`	By default the animation restarts at the starting keyframe; if set to `alternate` the animation direction changes every iteration.
`animation-delay`	Number of seconds (s) or milliseconds (ms) until the animation starts (default 0s).
`animation-name`	Identifies the `@keyframes`.
`animation-duration`	The duration of a single animation cycle in seconds (s) or milliseconds (ms).
`animation-timing-function`	Specifies how a CSS animation progresses between waypoints (common choices are `linear`, `ease-in`, `ease-out`, `steps(N)`).

CSS transitions



```css
.box {
  border-style: solid;
  border-width: 1px;
  display: block;
  width: 100px;
  height: 100px;
  background-color: red;
  -webkit-transition: width 2s, height 2s, -webkit-transform 2s;
  transition: width 2s, height 2s, transform 2s;
}
.box:hover {
  background-color: green;
  width: 200px;
  height: 200px;
  -webkit-transform: rotate(180deg);
  transform: rotate(180deg);
}
```

start state

declare transition

end state

We have been using (default) transitions all the time.

- Work on **Assignment 5**.
- Start working on **Assignment 6**.
- Tutorial topic this week: Node.js

flickr@courtneyrian