BUILDING LAYOUTS WITH MODERN CSS

↑

Original image by the amazing Lin Clark

Link to slides:

http://bit.ly/detech-css

Surname First name

陈 慧 晶

Chen Hui Jing

@hj_chen

https://events.mozilla.org/techspeakers

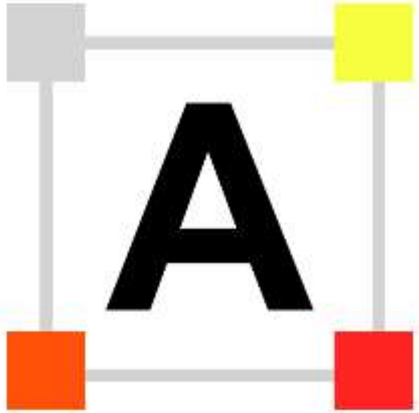
Developer Advocate

nexmo®

The Vonage® API Platform

General agenda

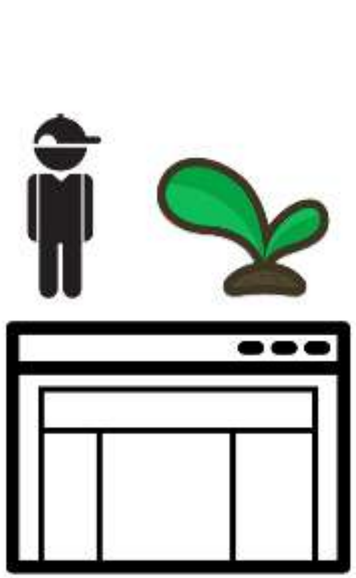
- Introduction and set up
- Pre-grid techniques and concepts
- Flexbox basics
  - Flex syntax
  - Aligning flex items
- Real-world application: Image gallery
- Grid basics
  - Auto-placement
  - Flexible sizing
  - Manual placement
- Real-world application: Responsive dashboard



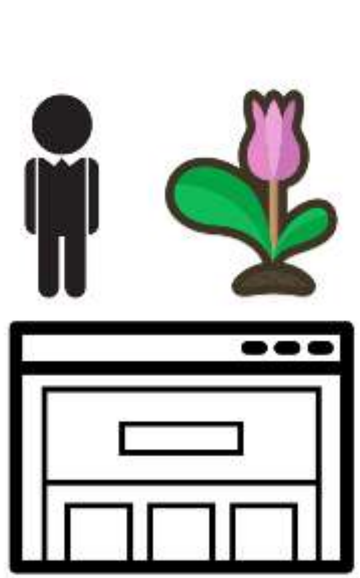
Evolution of browsers

No layout

HTML Tables



CSS Floats



Frameworks

Grid and beyond

Pre-grid techniques

HTML

```
<h2>Inline-block</h2>

<div class="inlineblock">
  <div class="inlineblock__item"><p>Item A</p></div><div class="inlineblock__item"><p>Item B</p></div><div
class="inlineblock__item"><p>Item C</p></div><div class="inlineblock__item"><p>Item D</p></div><div
class="inlineblock__item"><p>Item E</p></div><div class="inlineblock__item"><p>Item F</p></div>
</div>

<hr>

<h2>Floats</h2>

<div class="float">
  <div class="float__item">
    <p>Item A</p>
  </div>
  <div class="float__item">
    <p>Item B</p>
  </div>
  <div class="float__item">
    <p>Item C</p>
  </div>
  <div class="float__item">
    <p>Item D</p>
  </div>
  <div class="float__item">
    <p>Item E</p>
  </div>
  <div class="float__item">
```

Result

EDIT ON CODEPEN

Inline-block

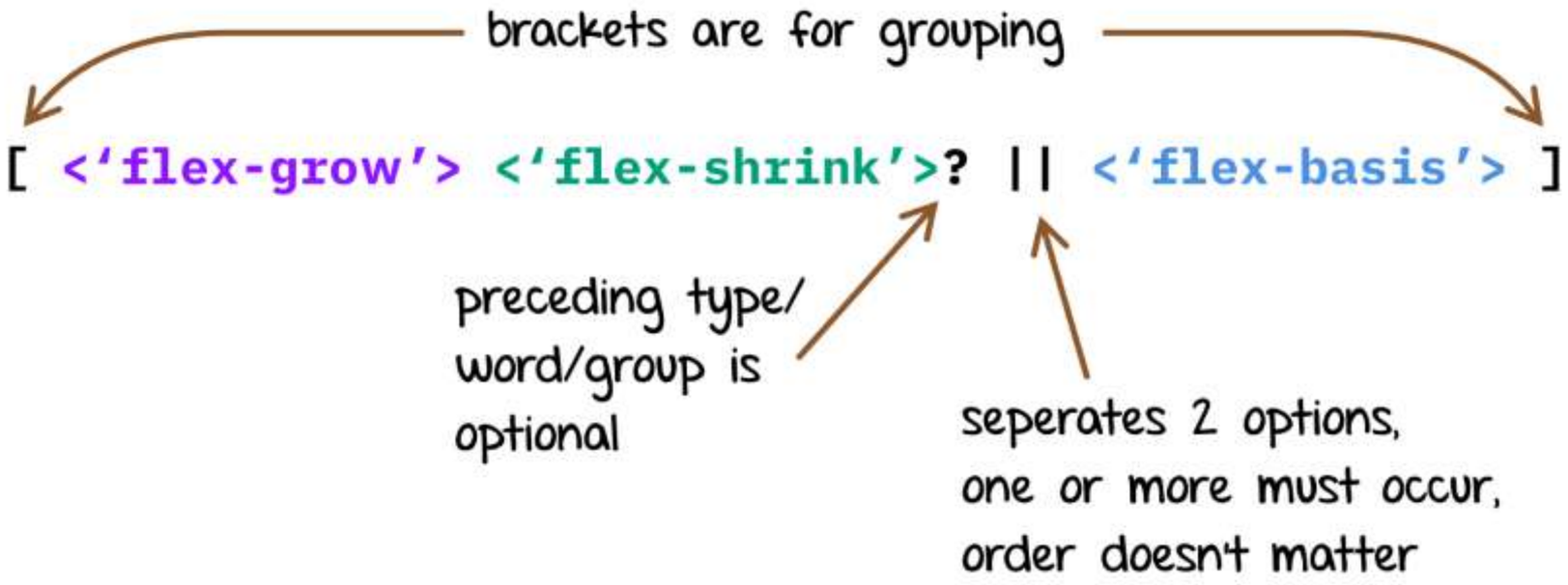
- Item A
- Item B
- Item C
- Item D
- Item E
- Item F

Floats

- Item A
- Item B

https://codepen.io/huijing/pen/KGOmLZ/

The `flex` syntax



Flexbox basics

HTML

```
<div class="wrapper">
  <div class="box">Word</div>
  <div class="box">This is a sentence.</div>
  <div class="box">A rather short sentence.</div>
</div>

<div class="wrapper">
  <div class="box">Word</div>
  <div class="box">This is a sentence.</div>
  <div class="box">For the purposes of this example, we need a paragraph. She must have hidden the plans in the escape pod.</div>
</div>
```

Result

EDIT ON CODEPEN

Word	This is a sentence.	A rather short sentence.

Word	This is a sentence.	For the purposes of this example, we need a paragraph. She must have hidden the plans in the escape pod.

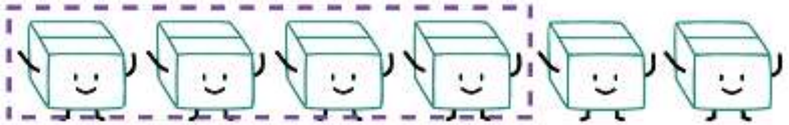
https://codepen.io/huijing/pen/NEPwoj/

Flex shorthand

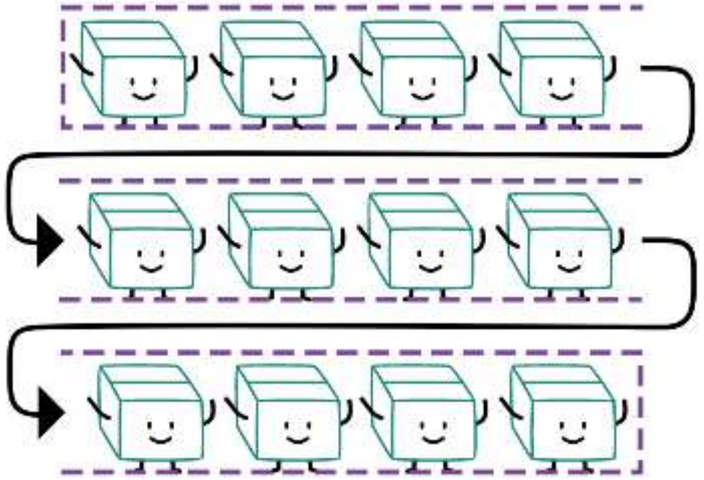
`flex: initial`	`flex: 0 1 auto`, cannot grow but can shrink when there isn't enough space
`flex: auto`	`flex: 1 1 auto`, can grow and shrink to fit available space
`flex: none`	`flex: 0 0 auto`, cannot grow or shrink, AKA inflexible
`flex: <positive-number>`	`flex: <positive-number> 1 0`, can grow and shrink, extent of growth depends on flex factor

> Authors are encouraged to control flexibility using the flex shorthand rather than with its longhand properties directly, as the shorthand *correctly resets any unspecified components* to accommodate common uses.
>
> —CSS Flexible Box Layout Module Level 1

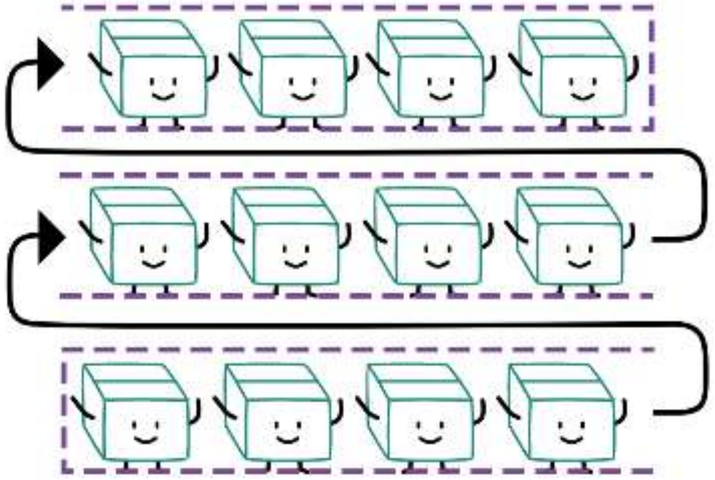
Flex lines



nowrap



wrap



wrap-reverse

Auto-margins with Flexbox

SCSS

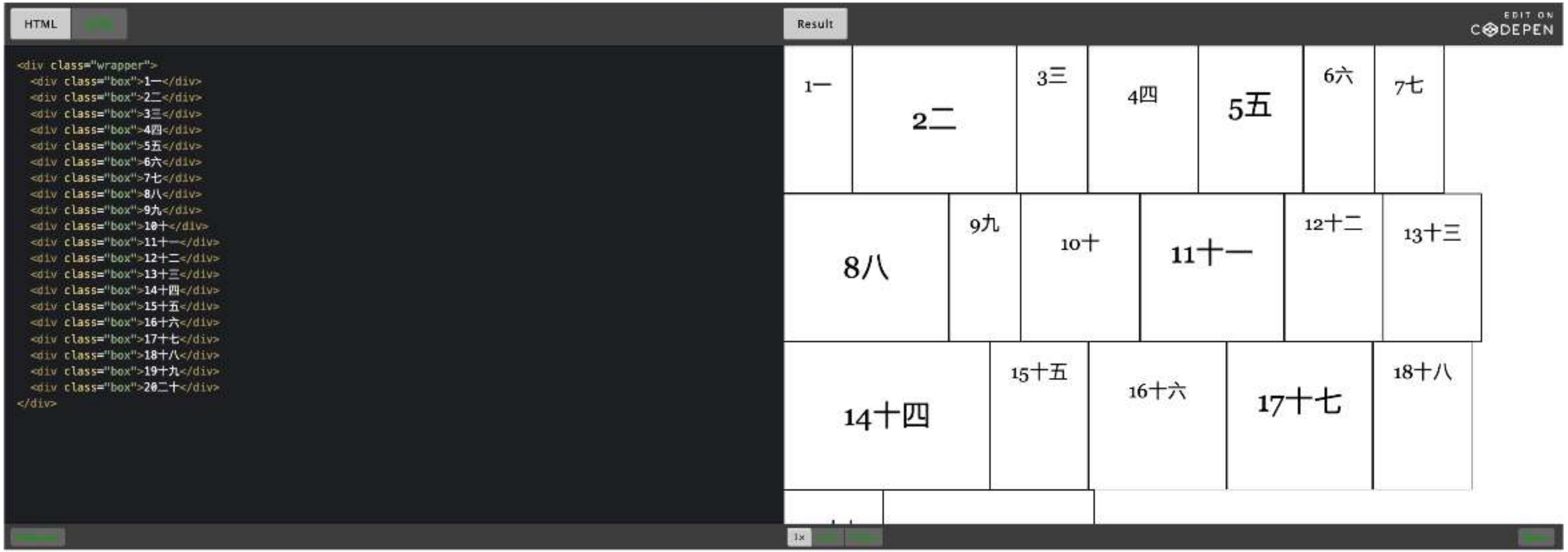
```scss
.flex {
  display: flex;
  height: 100%;
}

.centre .flex__item {

}

nav {
  box-sizing: border-box;
  background-color: black;
  display: flex;
}

nav a {
  padding: 1em;
  color: white;
  display: inline-block;
}

nav a:last-child {

}

// General styles
html {
  height: 100%;
}
```

Result

EDIT ON CODEPEN

https://codepen.io/huijing/pen/EOWedx/

Aligning flex items



https://codepen.io/huijing/pen/zMNqOo/

Image gallery

HTML

```
<ul>
  <li><img src="https://picsum.photos/300?image=101"></li>
  <li><img src="https://picsum.photos/200?image=102"></li>
  <li><img src="https://picsum.photos/320/400?image=103"></li>
  <li><img src="https://picsum.photos/180/320?image=104"></li>
  <li><img src="https://picsum.photos/430/320?image=1014"></li>
  <li><img src="https://picsum.photos/200?image=106"></li>
  <li><img src="https://picsum.photos/320/400?image=107"></li>
  <li><img src="https://picsum.photos/200?image=108"></li>
  <li><img src="https://picsum.photos/200/300?image=10"></li>
  <li><img src="https://picsum.photos/240/160?image=1010"></li>
  <li><img src="https://picsum.photos/200?image=1011"></li>
  <li><img src="https://picsum.photos/400/300?image=1012"></li>
  <li><img src="https://picsum.photos/200/350?image=1013"></li>
  <li><img src="https://picsum.photos/100?image=1014"></li>
  <li><img src="https://picsum.photos/220/300?image=1015"></li>
  <li><img src="https://picsum.photos/300?image=1016"></li>
  <li><img src="https://picsum.photos/200?image=1084"></li>
  <li><img src="https://picsum.photos/280/200?image=1018"></li>
  <li><img src="https://picsum.photos/300?image=1019"></li>
  <li><img src="https://picsum.photos/200/430?image=1020"></li>
  <li><img src="https://picsum.photos/160/320?image=1021"></li>
  <li><img src="https://picsum.photos/150?image=1022"></li>
  <li><img src="https://picsum.photos/200/430?image=1023"></li>
  <li><img src="https://picsum.photos/180/400?image=1024"></li>
  <li><img src="https://picsum.photos/200?image=1025"></li>
  <li><img src="https://picsum.photos/220/400?image=1026"></li>
  <li><img src="https://picsum.photos/300/430?image=1027"></li>
  <li><img src="https://picsum.photos/200?image=1028"></li>
```

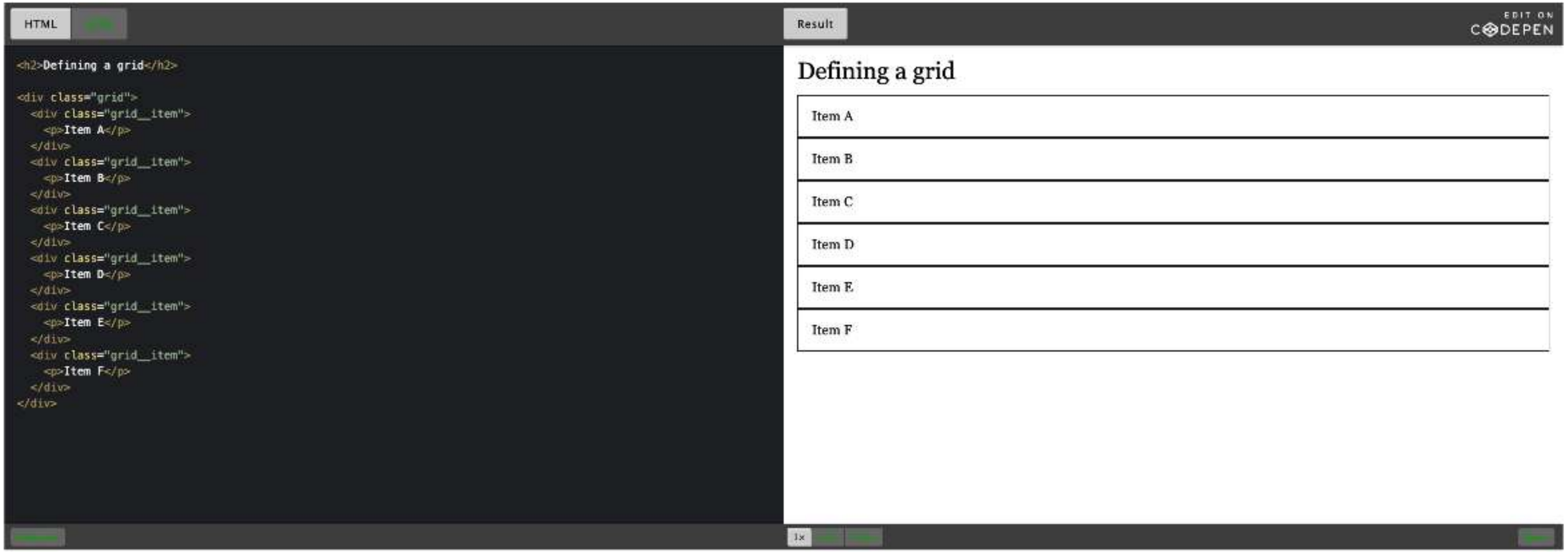
Result

EDIT ON CODEPEN

1x

https://codepen.io/huijing/pen/dQPZmL/

Defining a grid



https://codepen.io/huijing/pen/mzKoNj/

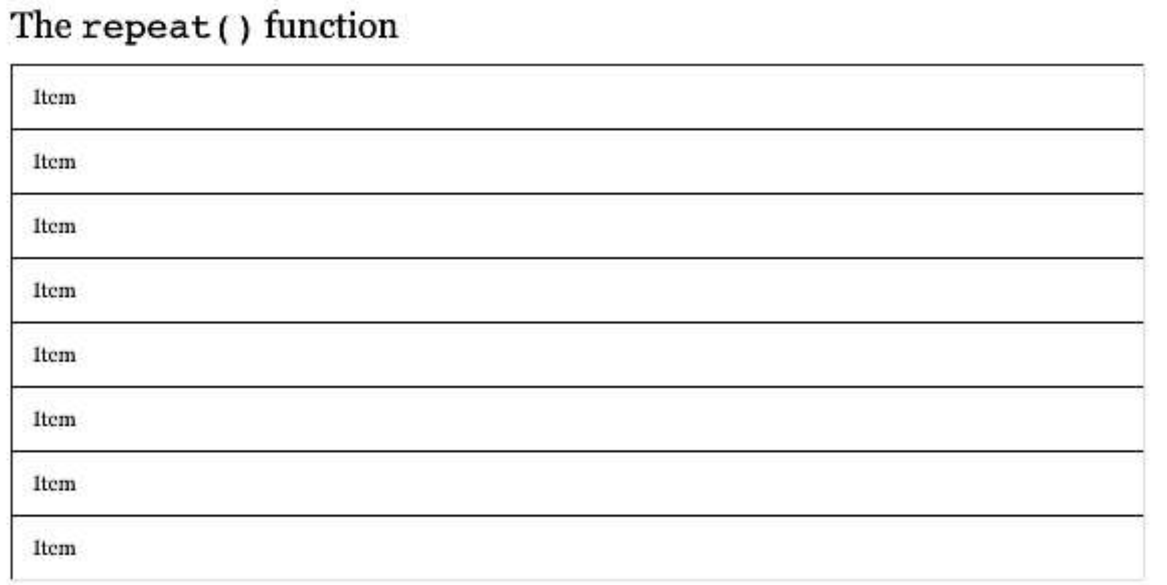
The `repeat()` function

HTML

```
<h2>The <code>repeat()</code> function</h2>
<div class="grid">
  <div class="grid__item">
    <p>Item</p>
  </div>
  <div class="grid__item">
    <p>Item</p>
  </div>
  <div class="grid__item">
    <p>Item</p>
  </div>
  <div class="grid__item">
    <p>Item</p>
  </div>
  <div class="grid__item">
    <p>Item</p>
  </div>
  <div class="grid__item">
    <p>Item</p>
  </div>
  <div class="grid__item">
    <p>Item</p>
  </div>
  <div class="grid__item">
    <p>Item</p>
  </div>
</div>
```

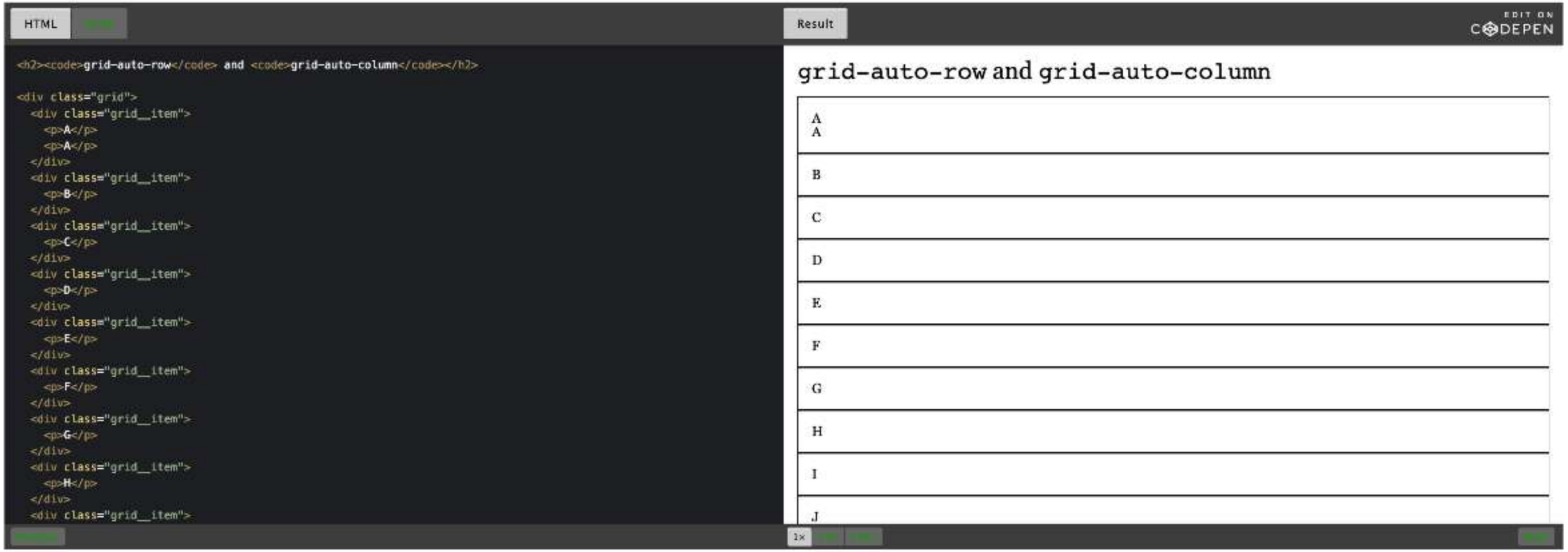
Result

EDIT ON CODEPEN



https://codepen.io/huijing/pen/XxveJe/

grid-auto-row and grid-auto-column



https://codepen.io/huijing/pen/ePqyMz/

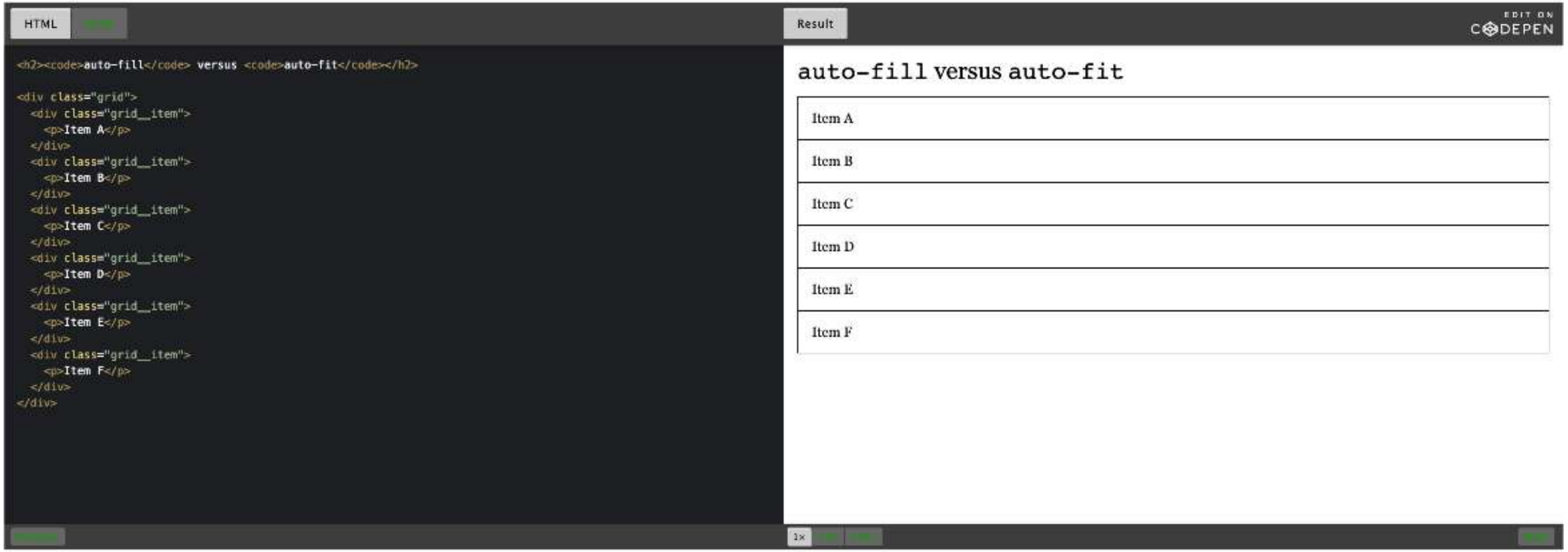
auto-fill versus auto-fit

HTML

```
<h2><code>auto-fill</code> versus <code>auto-fit</code></h2>

<div class="grid">
  <div class="grid__item">
    <p>Item A</p>
  </div>
  <div class="grid__item">
    <p>Item B</p>
  </div>
  <div class="grid__item">
    <p>Item C</p>
  </div>
  <div class="grid__item">
    <p>Item D</p>
  </div>
  <div class="grid__item">
    <p>Item E</p>
  </div>
  <div class="grid__item">
    <p>Item F</p>
  </div>
</div>
```

Result

EDIT ON CODEPEN



https://codepen.io/huijing/pen/GYVyMX/

The `grid-auto-flow` property

HTML

```
<h2>The <code>grid-auto-flow</code> property</h2>
<div class="grid">
  <div class="grid__item">
    <p>A</p>
  </div>
  <div class="grid__item">
    <p>B</p>
  </div>
  <div class="grid__item">
    <p>C</p>
  </div>
  <div class="grid__item">
    <p>D</p>
  </div>
  <div class="grid__item">
    <p>E</p>
  </div>
  <div class="grid__item">
    <p>F</p>
  </div>
  <div class="grid__item">
    <p>G</p>
  </div>
  <div class="grid__item">
    <p>H</p>
  </div>
  <div class="grid__item">
    <p>I</p>
  </div>
```

Result

EDIT ON CODEPEN

https://codepen.io/huijing/pen/LgwegQ/

The `fr` unit

SCSS

```scss
.grid {
  display: grid;

}

.grid__item {

}

// General styles
body {
  padding: 1em;
}

hr {
  margin: 2em 0;
}

h2 {
  font-size: 1.75em;
  margin-bottom: 0.5em;
}

code {
  font-family: monospace;
  font-size: 1.25em;
}

[class$="item"] {
```

Result

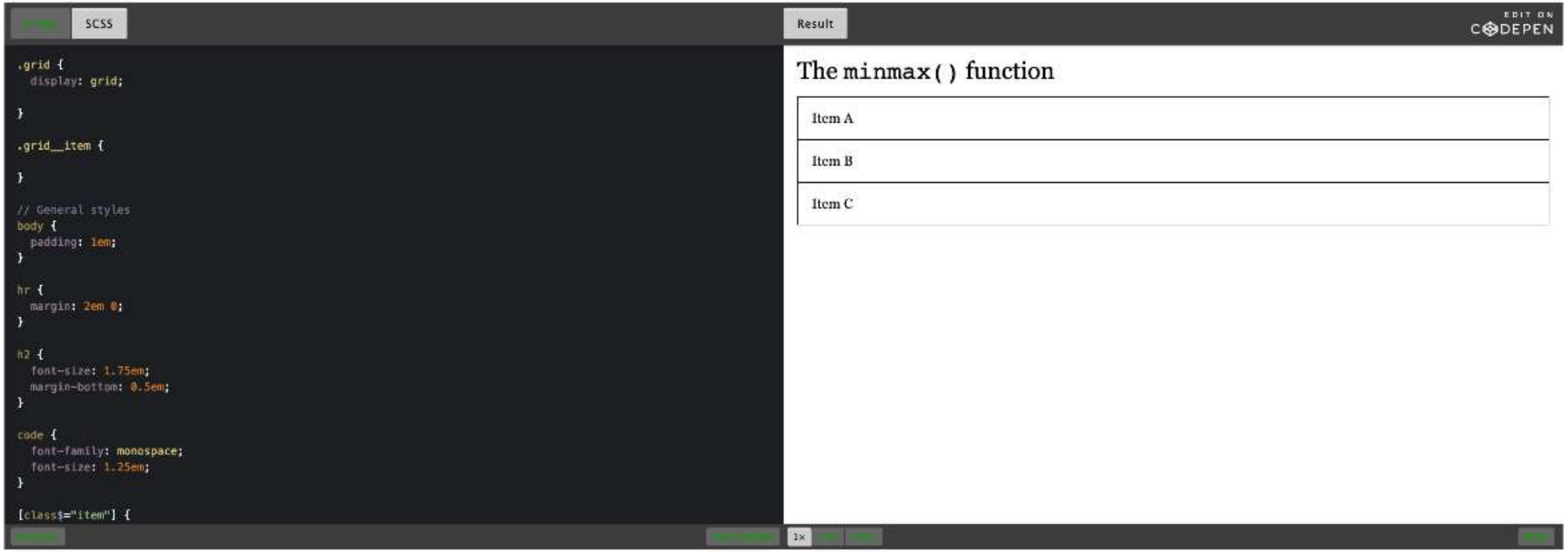
EDIT ON CODEPEN

The `fr` unit

- Item A
- Item B
- Item C

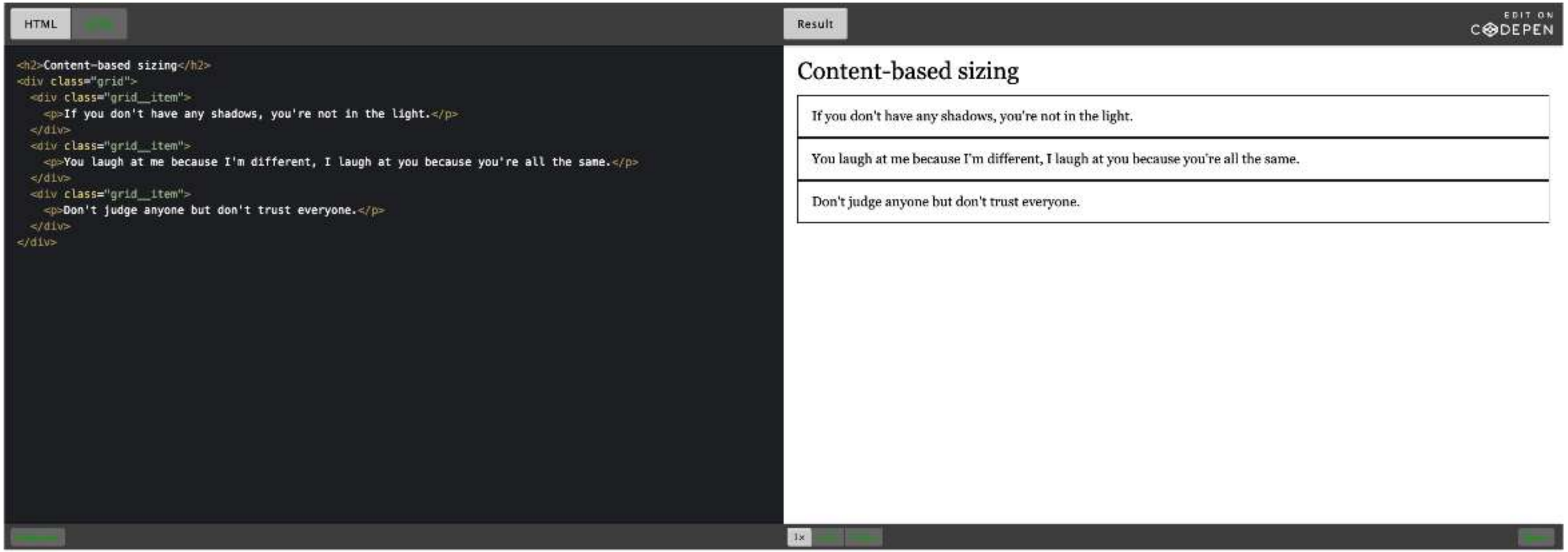
https://codepen.io/huijing/pen/WaVdLN/

The `minmax()` function



https://codepen.io/huijing/pen/jegYob/

Content-based sizing



https://codepen.io/huijing/pen/bmXLpd/

Image gallery (part 2)

HTML

```
<ul>
  <li><img src="https://picsum.photos/300?image=101"></li>
  <li><img src="https://picsum.photos/200?image=102"></li>
  <li><img src="https://picsum.photos/320/400?image=103"></li>
  <li><img src="https://picsum.photos/180/320?image=104"></li>
  <li><img src="https://picsum.photos/430/320?image=1014"></li>
  <li><img src="https://picsum.photos/200?image=106"></li>
  <li><img src="https://picsum.photos/320/400?image=107"></li>
  <li><img src="https://picsum.photos/200?image=108"></li>
  <li><img src="https://picsum.photos/200/300?image=10"></li>
  <li><img src="https://picsum.photos/240/160?image=1010"></li>
  <li><img src="https://picsum.photos/200?image=1011"></li>
  <li><img src="https://picsum.photos/400/300?image=1012"></li>
  <li><img src="https://picsum.photos/200/350?image=1013"></li>
  <li><img src="https://picsum.photos/100?image=1014"></li>
  <li><img src="https://picsum.photos/220/300?image=1015"></li>
  <li><img src="https://picsum.photos/300?image=1016"></li>
  <li><img src="https://picsum.photos/200?image=1084"></li>
  <li><img src="https://picsum.photos/280/200?image=1018"></li>
  <li><img src="https://picsum.photos/300?image=1019"></li>
  <li><img src="https://picsum.photos/200/430?image=1020"></li>
  <li><img src="https://picsum.photos/160/320?image=1021"></li>
  <li><img src="https://picsum.photos/150?image=1022"></li>
  <li><img src="https://picsum.photos/200/430?image=1023"></li>
  <li><img src="https://picsum.photos/180/400?image=1024"></li>
  <li><img src="https://picsum.photos/200?image=1025"></li>
  <li><img src="https://picsum.photos/220/400?image=1026"></li>
  <li><img src="https://picsum.photos/300/430?image=1027"></li>
  <li><img src="https://picsum.photos/200?image=1028"></li>
```

Result

EDIT ON CODEPEN

https://codepen.io/huijing/pen/dQPZmL/

Line-based placement

SCSS

```scss
.grid {
  display: grid;
  grid-template-columns: repeat(3, calc(100% / 3));
  grid-template-rows: repeat(3, calc(100% / 3));
}

.grid__item {

}

img {
  max-width: 100%;
  max-height: 100%;
}

// General styles
html {
  height: 100%;
}

body {
  padding: 1em;
  height: 100%;
}

hr {
  margin: 2em 0;
}
```

Result

EDIT ON CODEPEN

Line-based placement

https://codepen.io/huijing/pen/pxMaYp/

grid-column and grid-row

SCSS

```scss
.grid {
  display: grid;
  grid-template-columns: repeat(6, calc(100% / 6));
  grid-template-rows: repeat(6, calc(90vh / 6));
}

.grid__item:nth-child(1) {

}

.grid__item:nth-child(2) {

}

.grid__item:nth-child(3) {

}

.grid__item:nth-child(4) {

}

.grid__item:nth-child(5) {

}

.grid__item:nth-child(6) {

}
```

Result

EDIT ON CODEPEN

grid-column and grid-row

https://codepen.io/huijing/pen/zmgRgM/

The span keyword

SCSS

```scss
.grid {
  display: grid;
  grid-template-columns: repeat(5, 20%);
  grid-template-rows: repeat(5, 20vh);
}

.grid__item {

}

img {
  max-width: 100%;
  max-height: 100%;
}

// General styles
html {
  height: 100%;
}

body {
  padding: 1em;
  height: 100%;
}

hr {
  margin: 2em 0;
}
```

Result

EDIT ON CODEPEN

The span keyword

https://codepen.io/huijing/pen/NOQYMM/

Using the `grid-area` shorthand

SCSS

```scss
.grid {
  display: grid;
  grid-template-columns: repeat(5, 20%);
  grid-template-rows: repeat(3, 30vh);
}

.grid__item {

}

img {
  max-width: 100%;
  max-height: 100%;
}

// General styles
html {
  height: 100%;
}

body {
  padding: 1em;
  height: 100%;
}

hr {
  margin: 2em 0;
}
```

Result

EDIT ON CODEPEN

Using the `grid-area` shorthand

https://codepen.io/huijing/pen/vVoRzx/

Naming grid lines

HTML

```
<h2>Naming grid lines</h2>
<div class="grid">
  <div class="grid__item a">
    <p>Item A</p>
  </div>
  <div class="grid__item b">
    <p>Item B</p>
  </div>
  <div class="grid__item c">
    <p>Item C</p>
  </div>
  <div class="grid__item d">
    <p>Item D</p>
  </div>
  <div class="grid__item e">
    <p>Item E</p>
  </div>
  <div class="grid__item f">
    <p>Item F</p>
  </div>
</div>
```

Result

EDIT ON CODEPEN

Naming grid lines

Item A

Item B

Item C

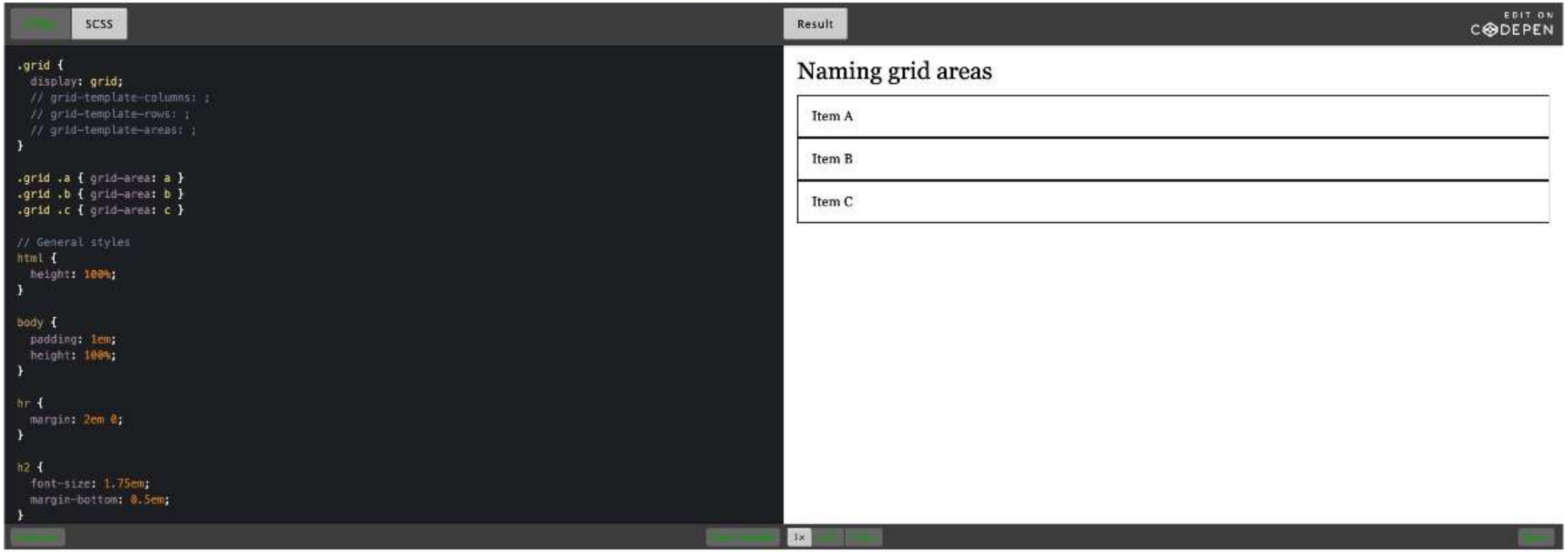
Item D

Item E

Item F

https://codepen.io/huijing/pen/xyvWBZ/

Naming grid areas



https://codepen.io/huijing/pen/EdqLxP/

Responsive dashboard

Do we have enough time?

HTML

```
<div class="title">
  <h1>Some dashboard</h1>
</div>

<div class="score">
  <p>Score: 100</p>
</div>

<div class="stats">
  <h2>Some statistics</h2>
  <p>🐓 rating: 65</p>
  <p>🚶 rating: 100</p>
  <p>🤦 rating: 75</p>
</div>

<div class="board">
  <h2 class="board_title">I dunno...use your imagination</h2>
  <div class="board_text">
    <p>Okay, fine...this is supposed to be a game board so let's centre the content of the board.</p>
    <p>This is sort of a trick question, actually...🤔</p>
    <p>Also, let's vertically centralise the title, score and statistics. Then centre the controls both
ways.</p>
  </div>
</div>

<div class="controls">
  <p><span>Up</span> <span>Up</span> <span>Down</span> <span>Down</span> <span>Left</span> <span>Right</span>
<span>Left</span> <span>Right</span> <span>B</span> <span>A</span></p>
</div>
```

Result

EDIT ON CODEPEN

Some dashboard

Score: 100

Some statistics

🐓 rating: 65
🚶 rating: 100
🤦 rating: 75

I dunno...use your imagination

Okay, fine...this is supposed to be a game board so let's centre the content of the board.
This is sort of a trick question, actually...🤔
Also, let's vertically centralise the title, score and statistics. Then centre the controls both ways.

Up Up Down Down Left Right Left Right B A

1x

https://codepen.io/huijing/pen/xQbXKO/

Feature queries

```
.selector {
  /* Styles that are supported in old browsers */
}

@supports (property:value) {
  .selector {
    /* Styles for browsers that support the specified property */
  }
}
```

Card-based layout

HTML

```
<main class="cards">
  <div class="card">
    <img src="https://picsum.photos/300?image=101">
    <h2>Card title</h2>
    <p>Because the card pattern is soooo popular right now...</p>
  </div>
  <div class="card">
    <img src="https://picsum.photos/200?image=102">
    <h2>Card title</h2>
    <p>Because the card pattern is soooo popular right now...</p>
  </div>
  <div class="card">
    <img src="https://picsum.photos/320/400?image=103">
    <h2>Card title</h2>
    <p>Because the card pattern is soooo popular right now...</p>
  </div>
  <div class="card">
    <img src="https://picsum.photos/180/320?image=104">
    <h2>Card title</h2>
    <p>Because the card pattern is soooo popular right now...</p>
  </div>
  <div class="card">
    <img src="https://picsum.photos/430/320?image=1014">
    <h2>Card title</h2>
    <p>Because the card pattern is soooo popular right now...</p>
  </div>
  <div class="card">
    <img src="https://picsum.photos/200?image=106">
    <h2>Card title</h2>
```

Result

EDIT ON CODEPEN

Card title

Because the card pattern is soooo popular right now...

https://codepen.io/huijing/pen/VVPjBL/

Useful references

- What Happens When You Create A Flexbox Flex Container?
- Everything You Need To Know About Alignment In Flexbox
- Use Cases For Flexbox
- CSS Grid Layout Module Level 1
- Codrops CSS Grid reference
- Grid by Example
- Learn CSS Grid
- Grid Auto-Placement Is Ready
- Automatizing the Grid
- Deep Dive into Grid Layout Placement
- CSS Grid Layout and positioned items
- CSS Logical Properties and Values in Chromium and WebKit
- Changes on CSS Grid Layout in percentages and indefinite height
- The Story of CSS Grid, from Its Creators
- CSS Grid Layout is Here to Stay
- The New Layout Standard For The Web: CSS Grid, Flexbox And Box Alignment
- Grid “fallbacks” and overrides
- Cascading Web Design with Feature Queries
- Basic grid layout with fallbacks using feature queries

Thank you!

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