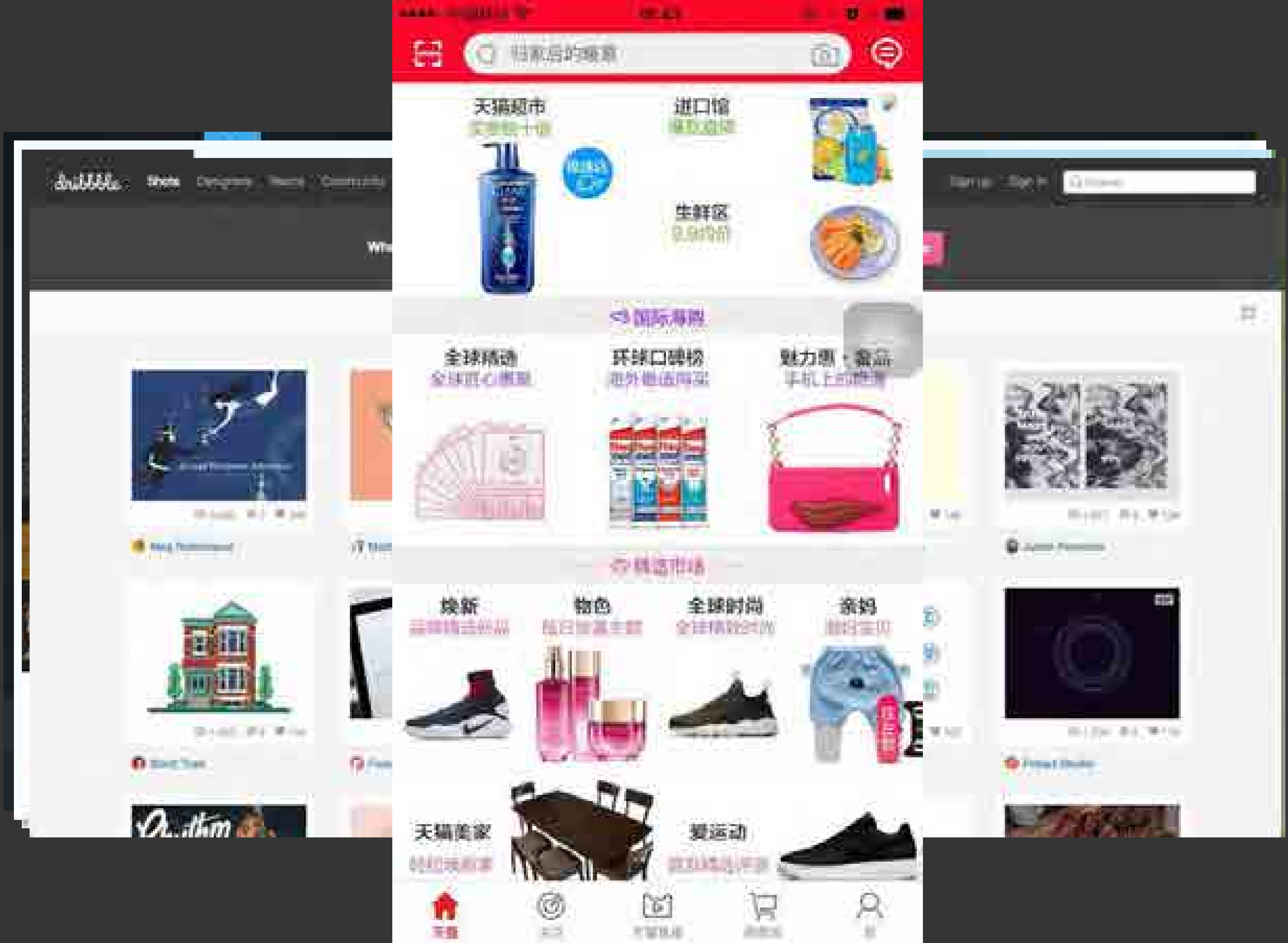
CSS Grid Layout

2016-12-17 @大漠 . #CSSConf

https://www.flickr.com/photos/19139526@N00/8331063530/

大漠

伪前端，就职于淘宝


dribbble
Shots
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Teams
Community
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天猫超市
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焕新
物色
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爱运动
首页

古老的table布局

DESIGNER
File
Edit
View
Insert
Modify
Format
Commands
Site
Window
Help
sixcolumn.html
Untitled-11
2column.html*
CSSLayoutExample.html
CSSLayoutExample.css
Untitled-16*
Code
Split
Design
Live View
TEXT
50 (40)
600
INSERT
Common
Hyperlink
Email Link
Named Anchor
Horizontal Rule
Table
Insert Div Tag
CSS STYLES
AP ELEMENTS
All
Current
All Rules
(no styles defined)
Properties
PROPERTIES
HTML
CSS
Cell
B
I
Link
Target
No wrap
Bg
Page Properties...
FILES
ASSETS

Title: Untitled Document

<body> <table> <tr> <td>

100% 695 x 292 2K / 1 sec Unicode (UTF-8)

Format: None

Class: None

ID: None

Horz: Center

现代Web布局

- Float
- inline-block
- display: table
- position (absolute 或 relative)
- Frameworks(很多Frameworks)

希望的Web布局

- Flexbox (https://drafts.csswg.org/css-flexbox)
- CSS Grid Layout (https://drafts.csswg.org/css-grid)
- Box Alignment (https://drafts.csswg.org/css-align)

CSS Grid System

Twitter
960
GRID SYSTEM
LET'S GO TO
LAS
VEGAS

Download - Templates: Acorn, Fireworks, Flash, InDesign, GIMP, Inkscape, Illustrator, OmniGraffle, Photoshop, Visio, Exp Design. Also: PDF sketch sheets + CSS files. Repository at GitHub.

3 days, 28 talks, 4 workshops, Jason Calacanis, Kevin Rose, Gary V + more.

CUSTOM CSS GENERATOR

HTML LAYOUT GENERATOR

GRID OVERLAY BOOKMARK

Essence

The 960 Grid System is an effort to streamline web development workflow by providing commonly used dimensions, based on a width of 960 pixels. There are two variants: 12 and 16 columns, which can be used separately or in tandem. Read more.

Dimensions

The 12-column grid is divided into portions that are 60 pixels wide. The 16-column grid consists of 40 pixel increments. Each column has 10 pixels of margin on the left and right, which create 20 pixel wide gutters between columns. View demo.

Purpose

The premise of the system is ideally suited to rapid prototyping, but it would work equally well when integrated into a production environment. There are printable sketch sheets, design layouts, and a CSS file that have identical measurements.

More Columns

Source Order

http://960.gs/

Grid System

FLEXBOX

Grid 计算公式

固定网格计算

网格容器总宽度 1180

网格间距m = 20

网格列数mc = 12

scw = (容器宽度 - (m * (mc - 1))) / mc

cw = (scw * cs) + (m * (cs - 1))

```
cs = 1 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 1 + 20 * (1 - 1) = 80
cs = 2 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 2 + 20 * (2 - 1) = 180
cs = 3 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 3 + 20 * (3 - 1) = 280
cs = 4 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 4 + 20 * (4 - 1) = 380
cs = 5 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 5 + 20 * (5 - 1) = 480
cs = 6 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 6 + 20 * (6 - 1) = 580
cs = 7 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 7 + 20 * (7 - 1) = 680
cs = 8 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 8 + 20 * (8 - 1) = 780
cs = 9 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 9 + 20 * (9 - 1) = 880
cs = 10 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 10 + 20 * (10 - 1) = 980
cs = 11 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 11 + 20 * (11 - 1) = 1080
cs = 12 => cw = (scw * cs) + (m * (cs - 1)) = 80 * 12 + 20 * (12 - 1) = 1180
```

scw = (容器宽度 - (m * (mc - 1))) / mc

scw = (1180 - (20 * (12 - 1))) / 12 = 80

scw = 80

cw = (scw * cs) + (m * (cs - 1))

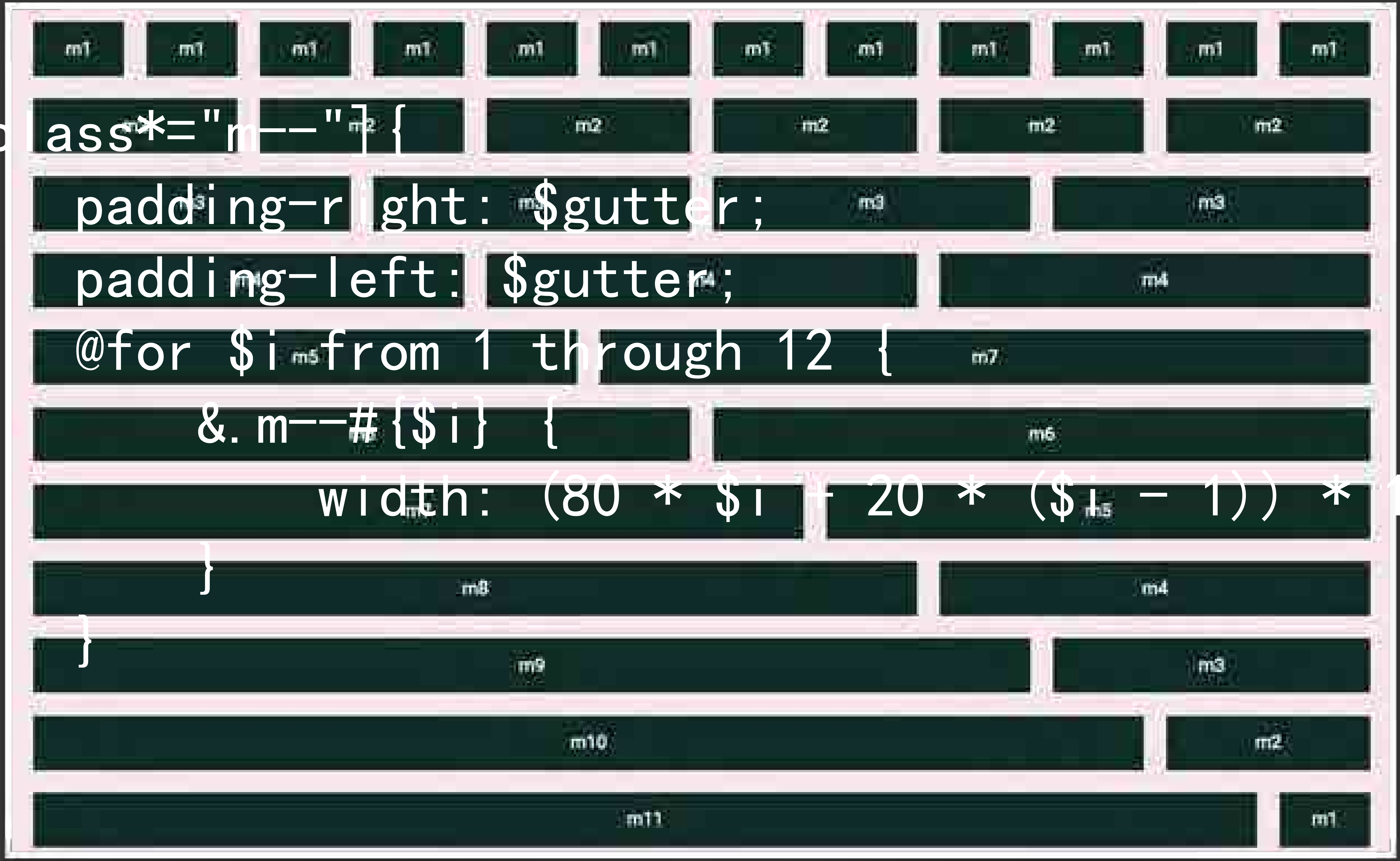
scw：指的是单列宽度

m：指的是列间距

mc：最大列数(一般是12)

cw：列宽度

cs：列数(1~12)



```
[class*="m--"]{
    padding-right: $gutter;
    padding-left: $gutter;
    @for $i from 1 through 12 {
        &.m--#{$i} {
            width: (80 * $i + 20 * ($i - 1)) * 1px;
        }
    }
}
```

http://codepen.io/airen/full/rMEggR/

Grid 计算公式

```
cs = 1 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 1 + 1.6% * (1 - 1) = 6.86667%
cs = 2 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 2 + 1.6% * (2 - 1) =  15.33333%
cs = 3 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 3 + 1.6% * (3 - 1) = 23.8%
cs = 4 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 4 + 1.6% * (4 - 1) = 32.26667%
cs = 5 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 5 + 1.6% * (5 - 1) = 40.73333%
cs = 6 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 6 + 1.6% * (6 - 1) = 49.2%
cs = 7 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 7 + 1.6% * (7 - 1) = 57.66667%
cs = 8 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 8 + 1.6% * (8 - 1) = 66.13333%
cs = 9 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 9 + 1.6% * (9 - 1) = 74.6%
cs = 10 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 10 + 1.6% * (10 - 1) = 83.06667%
cs = 11 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 11 + 1.6% * (11 - 1) = 91.53333%
cs = 12 => cw = (scw * cs) + (m * (cs - 1)) = 6.86667% * 12 + 1.6% * (12 - 1) = 100%
```

流体网格计算

网格容器总宽度100%

网格间距m = 1.6%

网格列数mc = 12

scw = (100% - (m * (mc - 1))) / mc

cw = (scw * cs) + (m * (cs - 1))

scw = (100% - (m * (mc - 1))) / mc

scw = (100% - (1.6% * (12 - 1))) / 12

scw = 6.8666666666667%

cw = (scw * cs) + (m * (cs - 1))

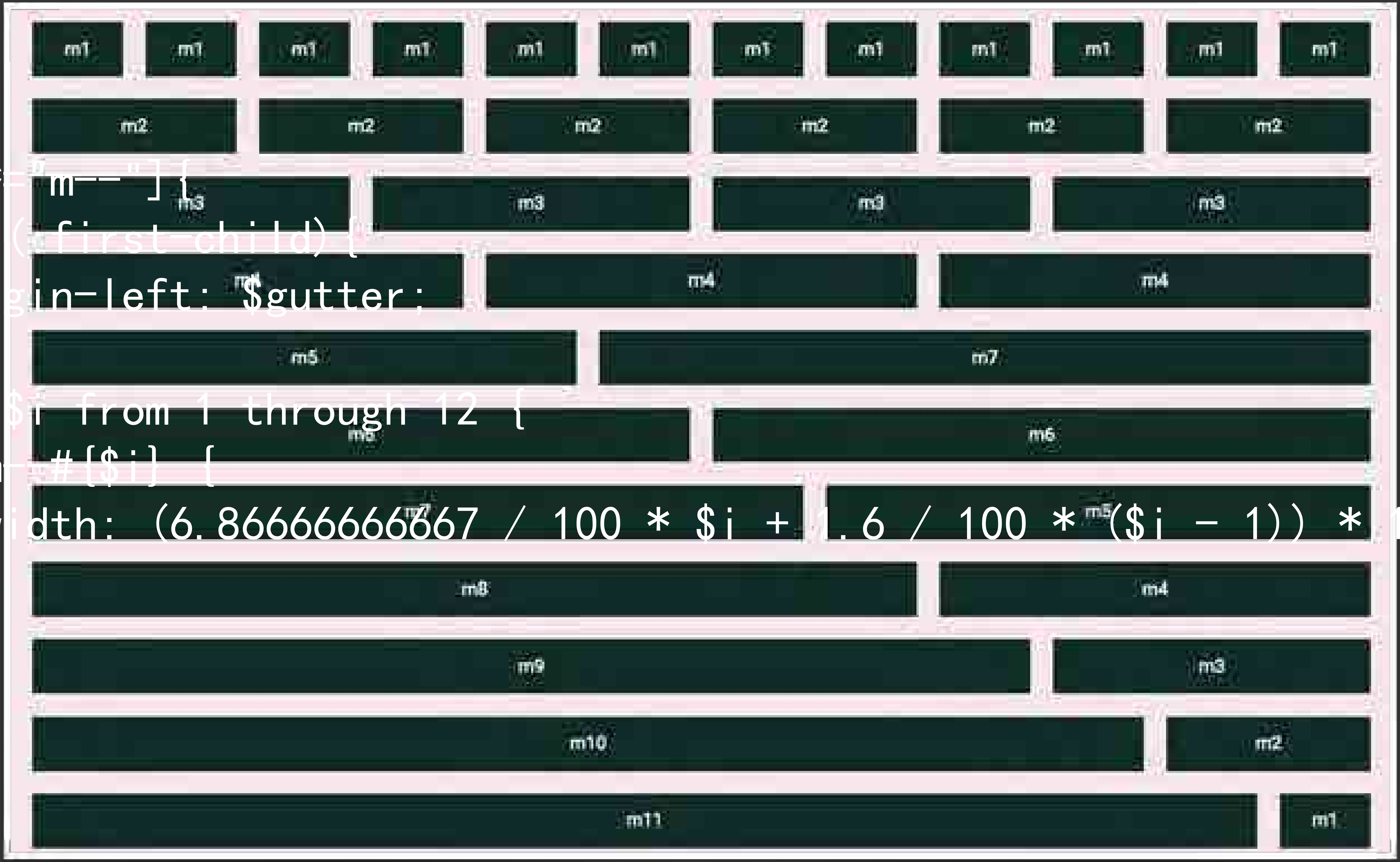
scw 指的是单列宽度

m: 指的是列间距(1.6%)

mc: 最大列数(一般是12)

cw: 列宽度

cs: 列数(1~12)



```
[class*="m--"]{
  &:not(:first-child){
    margin-left: $gutter;
  }
  @for $i from 1 through 12 {
    &.m--#{$i} {
      width: (6.86666666667 / 100 * $i + 1.6 / 100 * ($i - 1)) * 100%;
    }
  }
}
```

http://codepen.io/airen/full/dpBBYX/

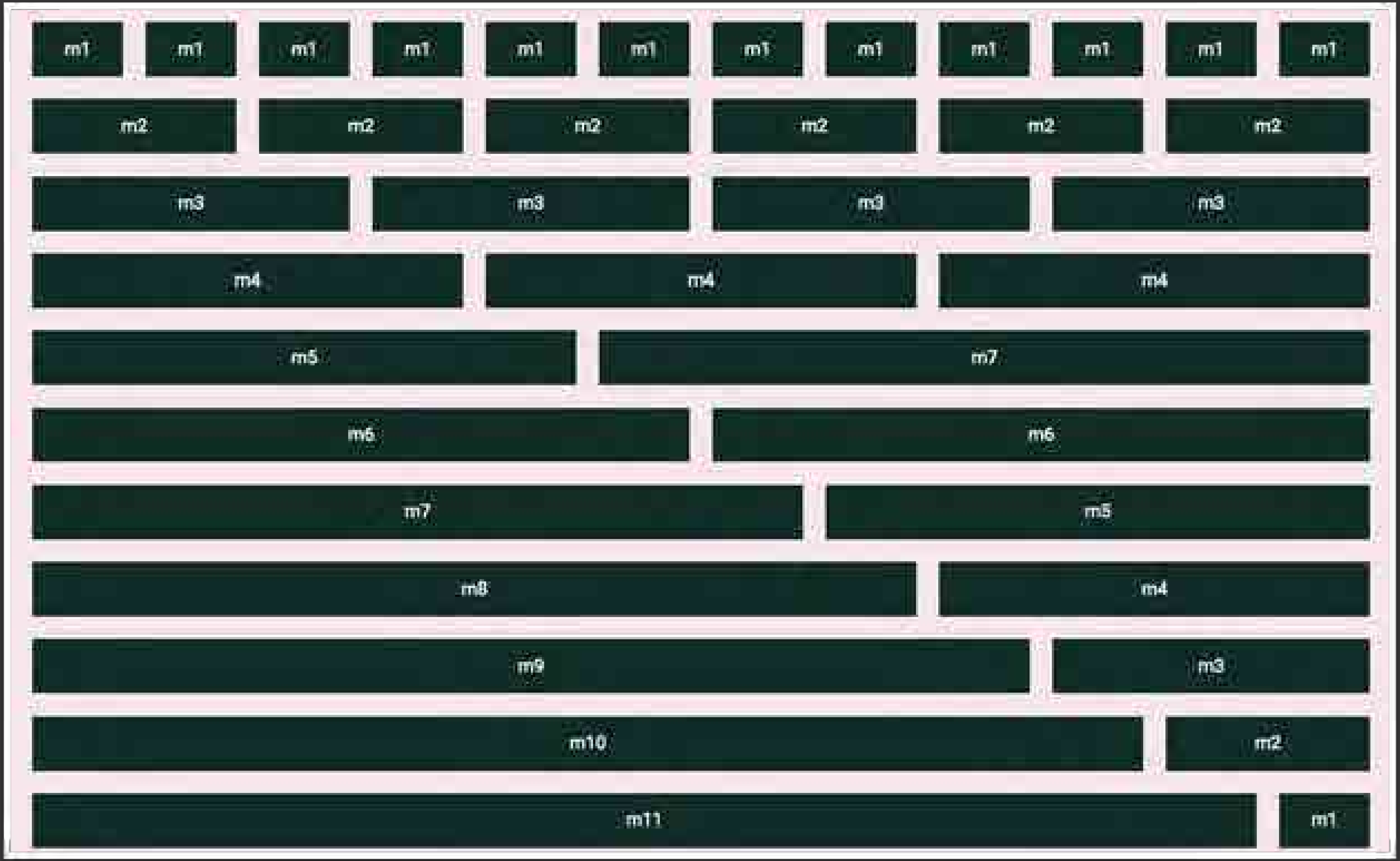
CSS变量创建Grid

```
.container {
    max-width: 1140px;
    margin: 3em auto;
    padding: var(--gutter);
}
.row{
    display: flex;
    flex-wrap: wrap;
    margin: 0 calc(var(--gutter) - ( var(--gutter) * 2) ) 20px;
}
[class*="m--"]{
    padding-right: calc(var(--gutter));
    padding-left: calc(var(--gutter));
    flex-basis: calc((100% / var(--columns)) * var(--column-width));

    @for $i from 1 through 12 {
        &.m--#{$i} {
            --column-width: $i;
        }
    }
}
```

```
:root{
    --color: #0C3934;
    --bg: #F8EBEE;

    /* Grid */
    --gutter: 10px; /*列间距*/
    --columns: 12; /*列数*/
}
```



m1 m1 m1 m1 m1 m1 m1 m1 m1 m1 m1 m1

m2 m2 m2 m2 m2 m2

m3 m3 m3 m3

m4 m4 m4

m5 m7

m6 m6

m7 m5

m8 m4

m9 m3

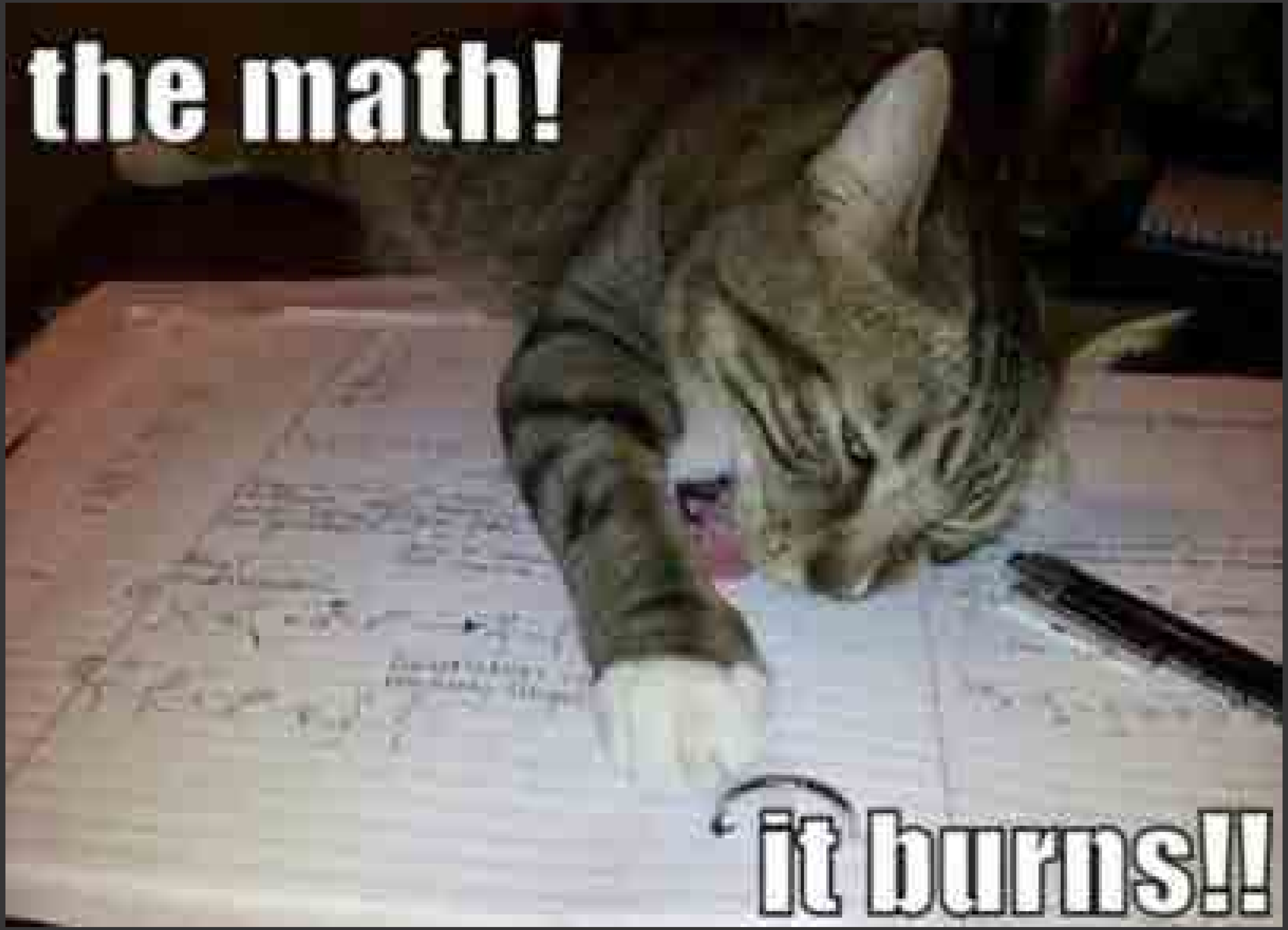
m10 m2

m11 m1

http://www.w3cplus.com/css3/create-css-grid-system-with-css-variables.html http://codepen.io/airen/full/jMjvON/

Grid Frameworks

- Susy
- 960gs
- BootStrap Grid
- Zen Grids
- …



CSS Grid Layout

CSS Grid Layout 发展过程

2010年由微软提出，最早在IE10实施

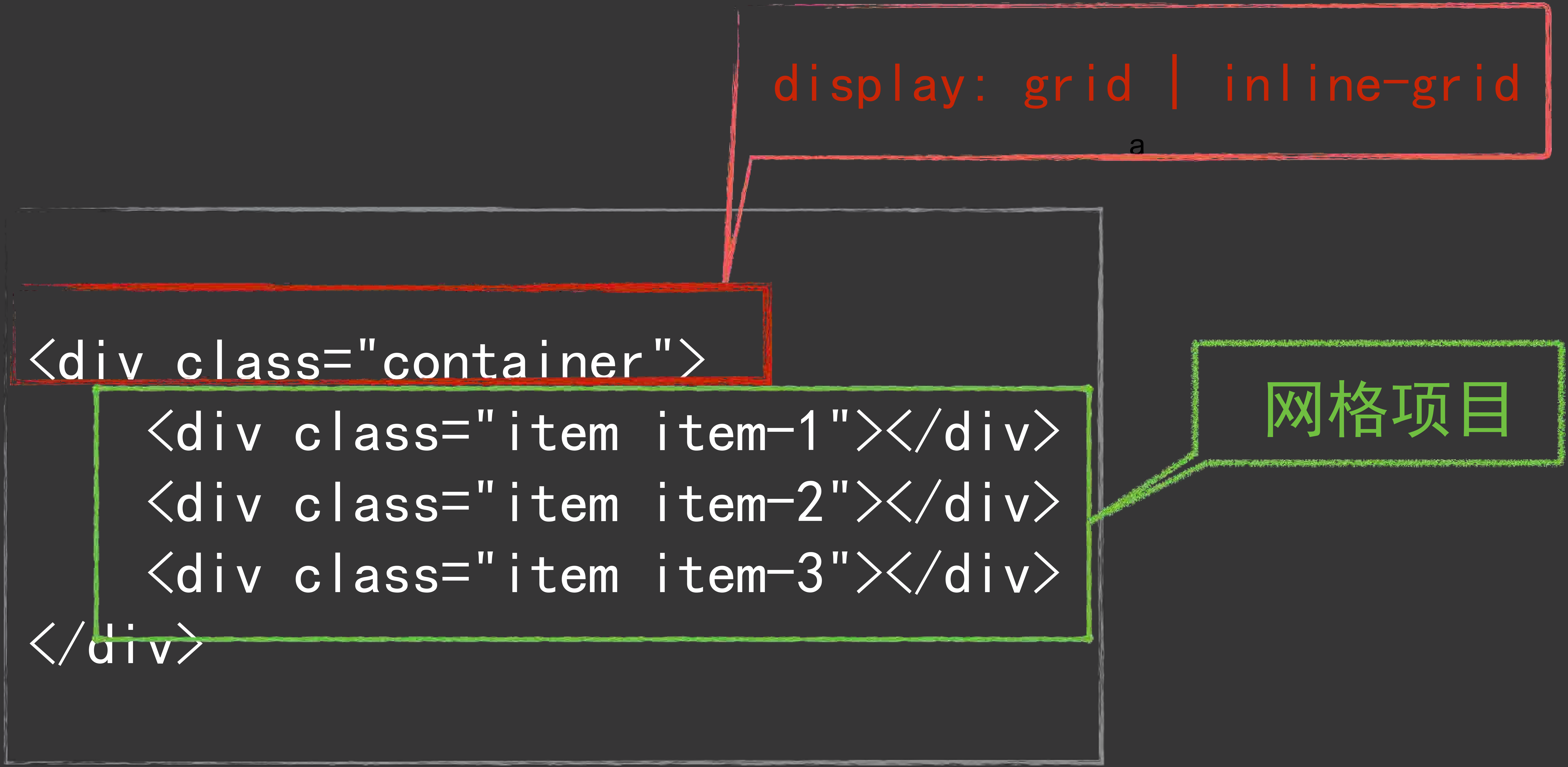
2011年4月首次公开草案

2015年3月2日Chrome支持

2016年9月29日成为W3C候选标准

Grid 术语

网格容器和网格项目



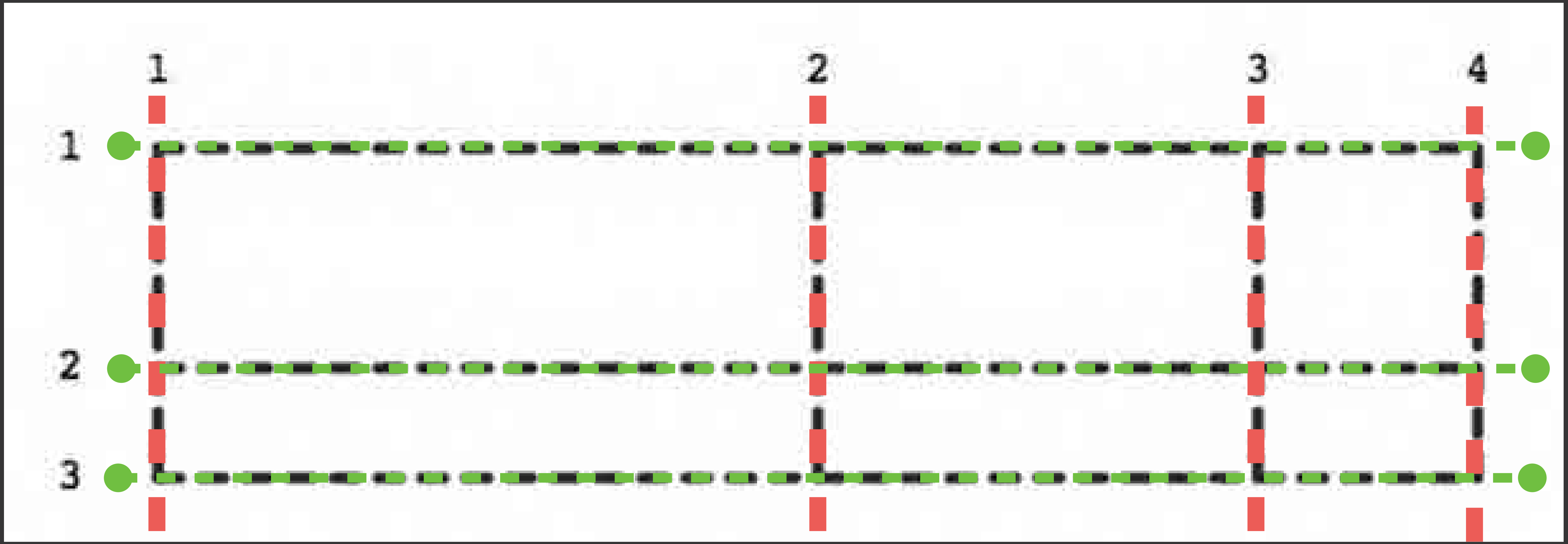
display: grid | inline-grid

a

```
<div class="container">
    <div class="item item-1"></div>
    <div class="item item-2"></div>
    <div class="item item-3"></div>
</div>
```

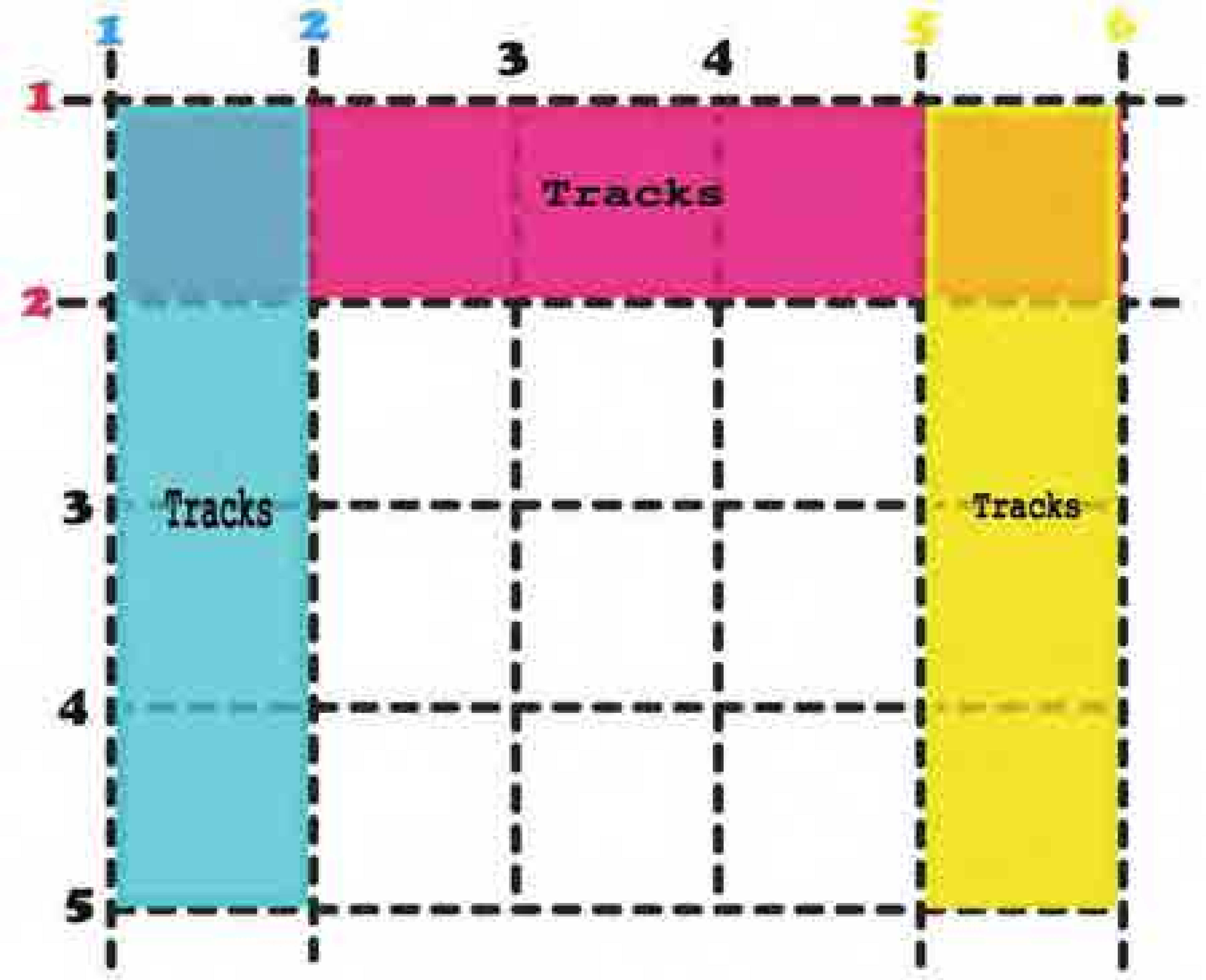
网格项目

网格线

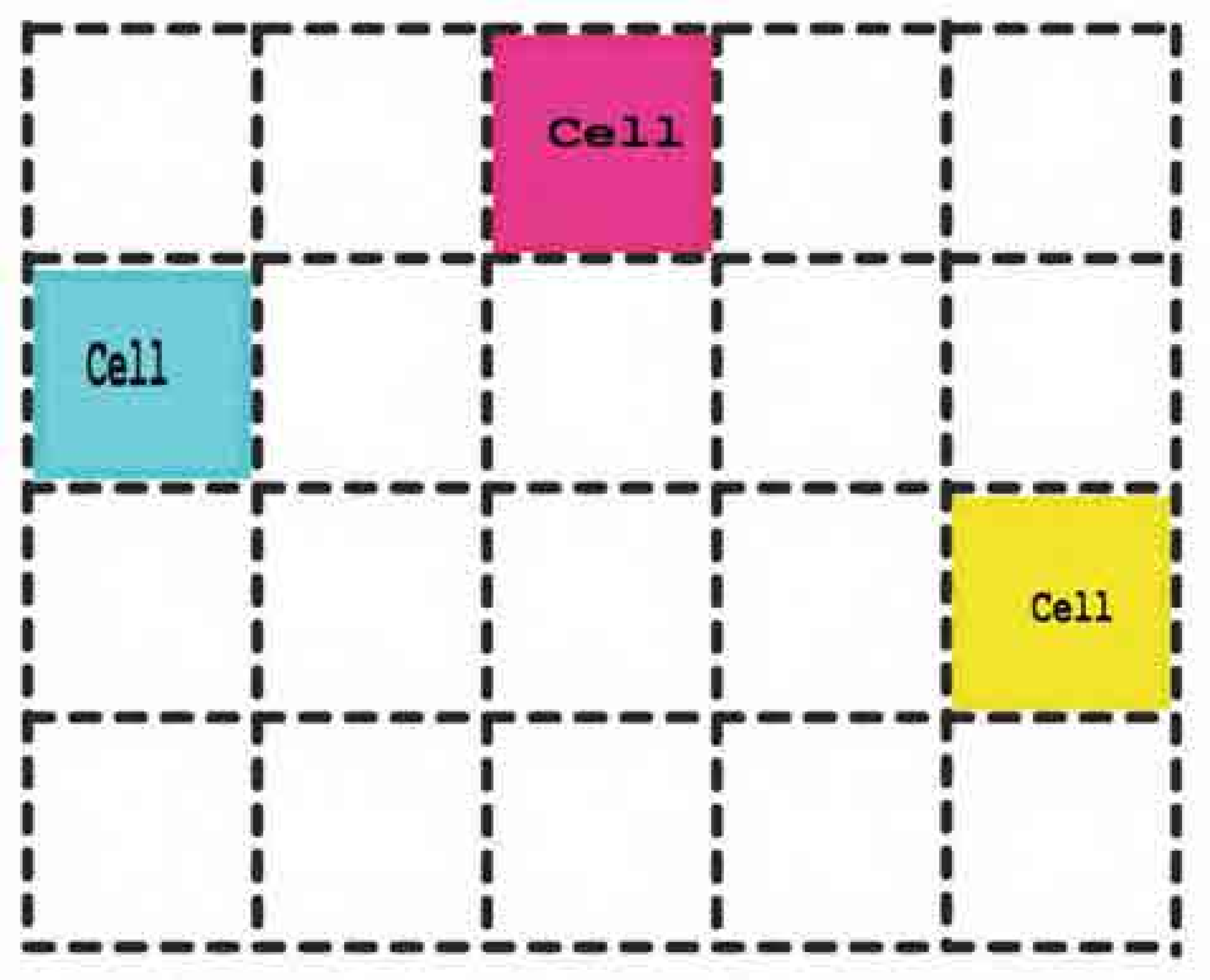


```
grid-template-columns: 300px 200px 100px;
grid-template-rows: 100px 50px;
```

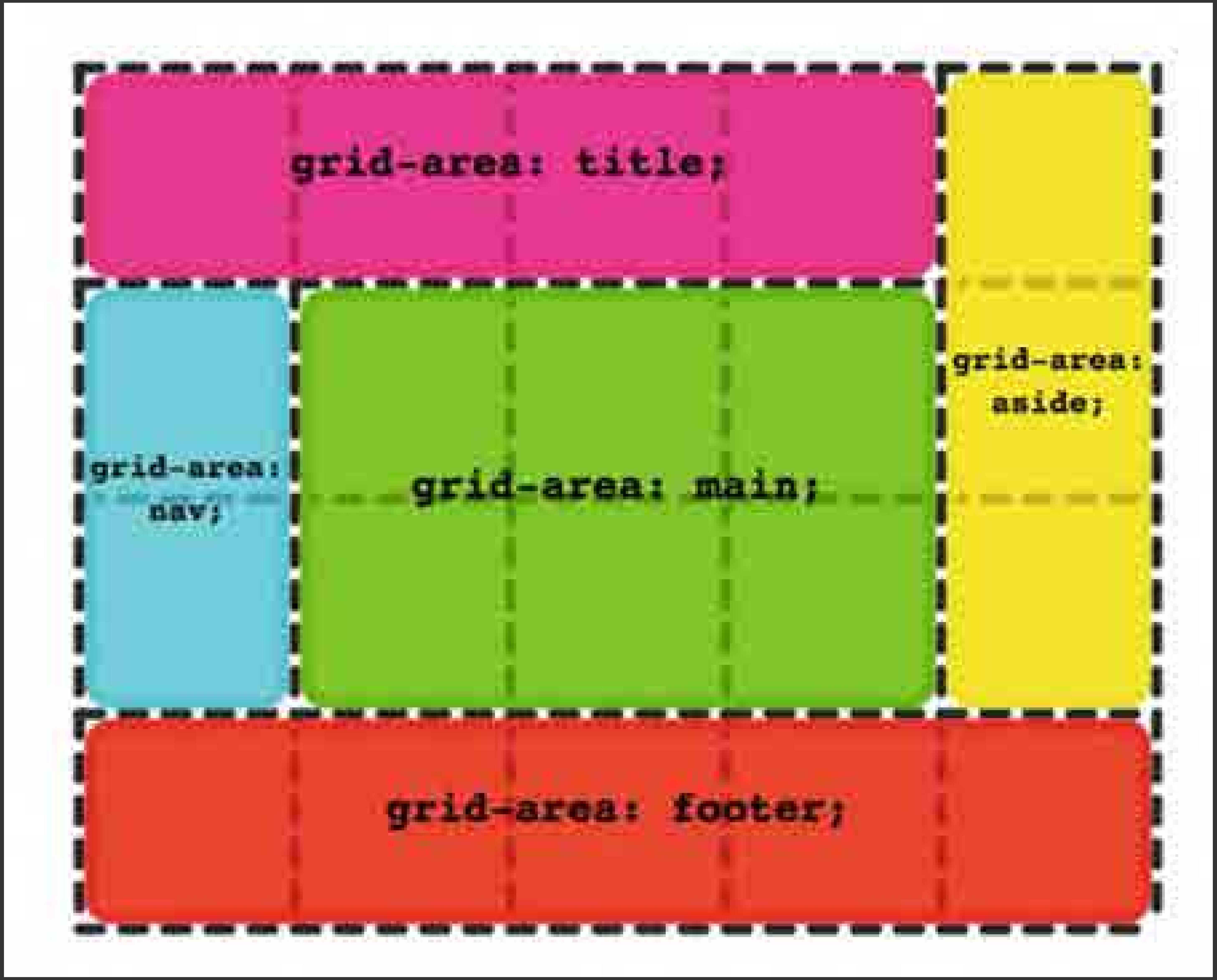
网格轨道



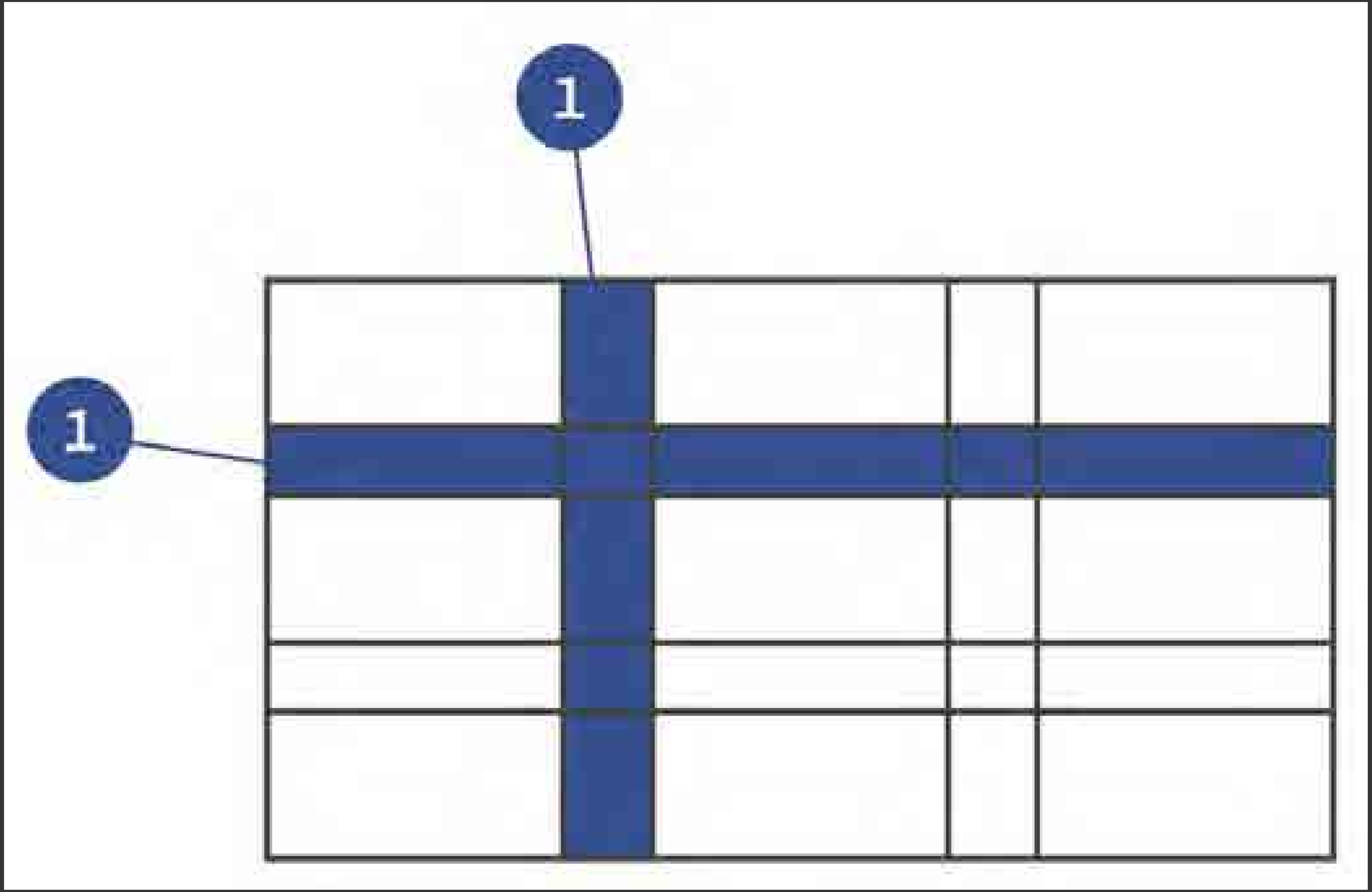
网格单元格



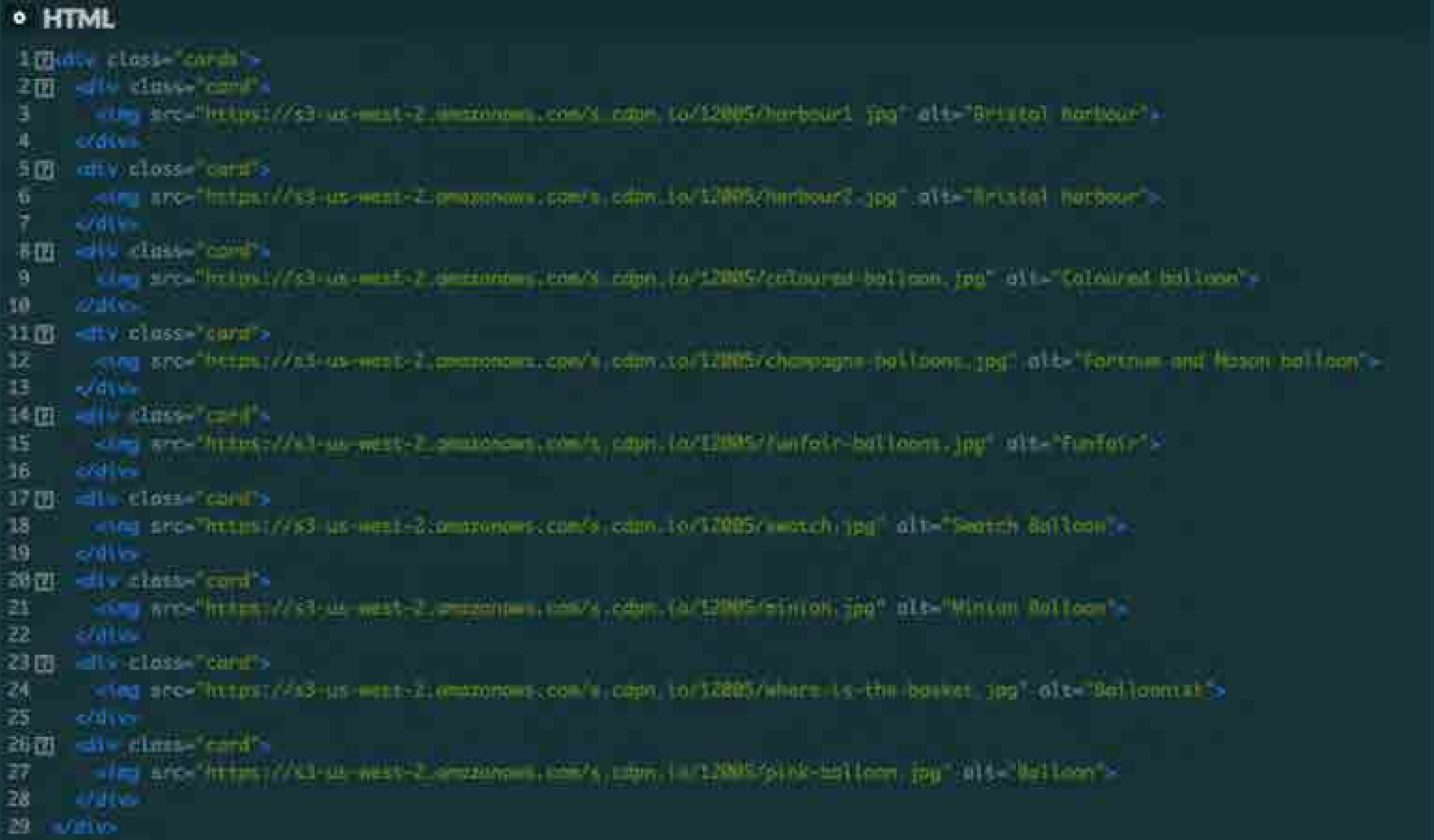
网格区域


grid-area: title;
grid-area: aside;
grid-area: nav;
grid-area: main;
grid-area: footer;

网格间距



定义网格



HTML

```html
<div class="cards">
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/harbour1.jpg" alt="Bristol harbour">
  </div>
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/harbour2.jpg" alt="Bristol harbour">
  </div>
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/coloured-balloon.jpg" alt="Coloured balloon">
  </div>
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/champagne-balloons.jpg" alt="Fortnum and Mason balloon">
  </div>
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/funfair-balloons.jpg" alt="Funfair">
  </div>
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/swatch.jpg" alt="Swatch Balloon">
  </div>
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/minion.jpg" alt="Minion Balloon">
  </div>
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/where-is-the-basket.jpg" alt="Balloonist">
  </div>
  <div class="card">
    <img src="https://s3-us-west-2.amazonaws.com/s.cdpn.io/12005/pink-balloon.jpg" alt="Balloon">
  </div>
</div>
```

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
  display: grid;
}
```

http://codepen.io/airen/full/woyoxz/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
  display: grid;
  grid-template-columns: 33.33% 33.33% 33.33%;
  grid-template-rows: 200px 200px 200px;
}
```

http://codepen.io/airen/full/MbQbqQ/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
    display: grid;
    grid-template-columns: 33.33% 33.33% 33.33%;
    grid-template-rows: 200px 200px 200px;
    grid-gap: 20px;
}
```

http://codepen.io/airen/full/gLvLZr/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
   display: grid;
   grid-template-columns: 1fr 1fr 1fr;
   grid-template-rows: 200px 200px 200px;
   grid-gap: 20px;
}
```

http://codepen.io/airen/full/woyoZJ/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
    display: grid;
    grid-template-columns: 500px 1fr 2fr;
    grid-template-rows: 200px 200px 200px;
    grid-gap: 20px;
}
```

http://codepen.io/airen/full/NbybVg/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
   display: grid;
   grid-template-columns: 1fr 1fr 1fr;
   grid-template-rows: 200px 200px 200px;
   grid-gap: 20px;
}
```

http://codepen.io/airen/full/woyoZJ/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
    display: grid;
    grid-template-columns: repeat(3, 1fr);
    grid-template-rows: 200px 200px 200px;
    grid-gap: 20px;
}
```

http://codepen.io/airen/full/GNQNbZ/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
    display: grid;
    grid-template-columns: repeat(3, 1fr) ;
    ~~grid-template-rows: 200px 200px 200px;~~
    grid-gap: 20px;
}
```

http://codepen.io/airen/full/YpepmX/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
    display: grid;
    grid-template-columns: repeat(3, 1fr) ;
    grid-auto-rows: 200px;
    grid-gap: 20px;
}
```

http://codepen.io/airen/full/aBqpbx/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
  display: grid;
  grid-template-columns: repeat(auto-fill, 200px) ;
  grid-gap: 20px;
}
```

http://codepen.io/airen/full/aBqpbx/

Defining a Grid
div.cards | 1340 × 420
Fork
Change View

```
.cards {
  display: grid;
  grid-template-columns: repeat(auto-fill, 200px) ;
  grid-gap: 20px;
}
```

http://codepen.io/airen/full/aBqpbx/

Defining a Grid
A PEN BY Airen
Fork
Change View
Elements
Console
Sources
Network
Timeline
Profiles
Application
Security
Audits
PageSpeed
Styles
Computed
Event Listeners
DOM Breakpoints
Filter
:hov
.cls
+

```
▼<html class=" -webkit-">
  ▶<head>…</head>
  ▼<body translate="no">
    ▶<div class="cards">…</div> == $0
    </body>
  </html>
</iframe>
```

```
grid-template-columns: repeat(auto-fill, 200px);
grid-gap: ▶ 20px;
margin: ▶ 0 auto;
```

http://codepen.io/airen/full/aBqpbx/

Defining a Grid
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Change View

```css
.cards {
  display: grid;
  grid-template-columns:
      repeat(auto-fill, minmax(200px,1fr)) ;
  grid-gap: 20px;
}
```

http://codepen.io/airen/full/ObQWNm/

Defining a Grid
div.cards 1340×420
Fork
Change View

```
.cards {
  display: grid;
  grid-template-columns:
      repeat(auto-fill, minmax(200px,1fr)) ;
  grid-gap: 20px;
}
```

http://codepen.io/airen/full/ObQWNm/

Defining a Grid
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Audits
PageSpeed
Styles
Computed
Event Listeners
DOM Breakpoints
:hov
.cls

```
allow-popups allow-modals allow-forms" allowtransparency="true" allowfullscreen="true" class="result-iframe">
  ▼#document
    ▼<html class=" -webkit-">
      ▶<head>…</head>
      ▼<body translate="no">
        ▶<div class="cards">…</div> == $0
```

```
grid-template-columns: repeat(auto-fill,
        minmax(200px, 1fr));
grid-gap: ▶ 20px;
```

http://codepen.io/airen/full/ObQWNm/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.card:nth-child(1) {
  grid-column-start:  2;
  grid-column-end:  4;
  grid-row-start:  1;
  grid-row-end:  3;
}
```

http://codepen.io/airen/full/Nbydjy/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.card:nth-child(1) {
  grid-column: 2 / 4;
  grid-row: 1 / 3;
}
```

http://codepen.io/airen/full/LbQxjp/

Defining a Grid
A PEN BY Airen
Fork
Change View

```
.card:nth-child(1) {
   grid-area:  1 / 2  / 3 / 4;
   /*grid-area: grid-row-start / grid-column-start / grid-row-end / grid- column-
end*/
}
```

http://codepen.io/airen/full/WoMREJ/

Define a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
  display: grid;
  grid-template-columns:
      [side-start] 1fr
      [main-start] 1fr
      1fr  [main-end];
  grid-template-rows:
      [main-start] 200px
      200px [main-end];
  grid-gap: 20px;
}
```

```
.card:nth-child(1) {
  grid-column:
     main-start / main-end;
  grid-row:
     main-start / main-end;
}
```

http://codepen.io/airen/full/ZBrLaP

Define a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
  display: grid;
  grid-template-columns:
      [side-start] 1fr
      [main-start] 1fr
      1fr  [main-end];
  grid-template-rows:
      [main-start] 200px
      200px [main-end];
  grid-gap: 20px;
}
```

```
.card:nth-child(1) {
  grid-area:  main;
}
```

http://codepen.io/airen/full/ENQZLx/

Define a Grid
A PEN BY Airen
Fork
Change View

```
.cards {
  display: grid;
  grid-template-columns:
      repeat(3, 1fr);
  grid-template-rows:
      200px 200px;
  grid-template-areas:
     ” side1 main main”
     ” side2 main main” ;
  grid-gap: 20px;
}
```

```
.card:nth-child(1) {
  grid-area: main;
}
.card:nth-child(4) {
  grid-area: side1;
}
.card:nth-child(8) {
  grid-area: side2;
}
```

http://codepen.io/airen/full/MbQJGx/

A 12 column, flexible grid

```
  <div class="col-xs-6 col-md-4">.col-xs-6 .col-md-4</div>
</div>


<!-- Columns start at 50% wide on mobile and bump up to 33.3% wide on desktop -->
<div class="row">
  <div class="col-xs-6 col-md-4">.col-xs-6 .col-md-4</div>
  <div class="col-xs-6 col-md-4">.col-xs-6 .col-md-4</div>
  <div class="col-xs-6 col-md-4">.col-xs-6 .col-md-4</div>
</div>


<!-- Columns are always 50% wide, on mobile and desktop -->
<div class="row">
  <div class="col-xs-6">.col-xs-6</div>
```

BootStrap Grid: http://getbootstrap.com/css/#grid

Using a single set of `.col-md-*` grid classes, you can create a basic grid system that starts out stacked on mobile devices and tablet devices (the extra small to small range) before becoming horizontal on desktop (medium) devices. Place grid columns in any `.row`.

.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1

.col-md-8	.col-md-4

.col-md-4	.col-md-4	.col-md-4

.col-md-6	.col-md-6

BootStrap Grid: http://getbootstrap.com/css/#grid

```html
<div class="wrapper skeleton">
  <h1 class="header">CSS Grid Layout Version</h1>
  <div class="box1">Four columns</div>
  <div class="box2">Four columns</div>
  <div class="box3">Four columns</div>
  <div class="box4">Eight columns</div>
  <div class="box5">Four columns</div>
  <div class="box6">Three columns</div>
  <div class="box7">Three columns</div>
  <div class="box8">Three columns</div>
  <div class="box9">Three columns</div>
  <div class="box10">Six columns</div>
  <div class="box11">Six columns</div>
</div>
```

CSS Grid
A PEN BY Airen
Fork
Change View

CSS Grid Layout Version

FOUR COLUMNS
FOUR COLUMNS
FOUR COLUMNS
EIGHT COLUMNS
FOUR COLUMNS
THREE COLUMNS
THREE COLUMNS
THREE COLUMNS
THREE COLUMNS
SIX COLUMNS
SIX COLUMNS

```
.wrapper {
  display: grid;
}
```

http://codepen.io/airen/full/bBLg0j/

```
.wrapper {
  display: grid;
  grid-template-columns: repeat(12, [col] 1fr);
  grid-template-rows: repeat(5, [row] auto);
  grid-column-gap: 1em;
  grid-row-gap: 15px;
}
```

http://codepen.io/airen/full/aBqpxd/

CSS Grid
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Change View
CSS Grid Layout Version
FOUR COLUMNS
FOUR COLUMNS
FOUR COLUMNS
EIGHT COLUMNS
FOUR COLUMNS
THREE COLUMNS
THREE COLUMNS
THREE COLUMNS
THREE COLUMNS
SIX COLUMNS
SIX COLUMNS

```
.header {
  grid-column: col / span 12;
  grid-row: 1;
}
.box1 {
  grid-column: col / span 4;
  grid-row: row 2;
}
```

http://codepen.io/airen/full/KNQaYE/

WoMRVL
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Fork
Change View
CSS Grid Layout Version
FOUR COLUMNS TWO ROWS
FOUR COLUMNS THREE ROWS
FOUR COLUMNS
FOUR COLUMNS
THREE COLUMNS
ONE
ONE
THREE COLUMNS
SIX COLUMNS
SIX COLUMNS

```
.box1 {
  grid-column: col / span 4;
  grid-row: row 2 / span 2;
}
.box2 {
  grid-column: col 5 / span 4;
  grid-row: row 2 / span 3;
}
```

http://codepen.io/airen/full/WoMRVL/

12 Column Grid with CSS Grid Layout Version
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Fork
Change View
12 Column Grid with CSS Grid Layout Version
COL1 COL1 COL1 COL1 COL1 COL1 COL1 COL1 COL1 COL1 COL1 COL1
COL2 COL2 COL2 COL2 COL2 COL2
COL3 COL3 COL3 COL3
COL4 COL4 COL4
COL5 COL7
COL6 COL6
COL4 COL8
COL3 COL9
COL2 COL10
COL1 COL11
COL12

```
.container {
  display: grid;
  grid-template-columns: repeat(12, [col] 1fr);
  grid-column-gap: 1em;
  grid-row-gap: 15px;
}
[class*= “col”]:nth-of-type(n+1):nth-of-type(-n+12) { grid-column: span;}
[class*= “col”]:nth-of-type(n+13):nth-of-type(-n+18) { grid-column: span 2;}
```

http://codepen.io/airen/full/MbQpKW/

Grid and Box Alignment Module

Flexbox alignment
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Fork
Change View

```
.wrapper {
  display: flex;
}
.wrapper li {
  min-width: 1%;
  flex: 1 0 25%;
}
```

```
.wrapper li:nth-child(2) {
  align-self:  center;
}
.wrapper li:nth-child(3) {
  align-self:  flex-start;
}
.wrapper li:nth-child(4) {
  align-self:  flex-end;
}
```

http://codepen.io/airen/full/PbQpmy/

Grid alignment
A PEN BY Airen
Fork
Change View

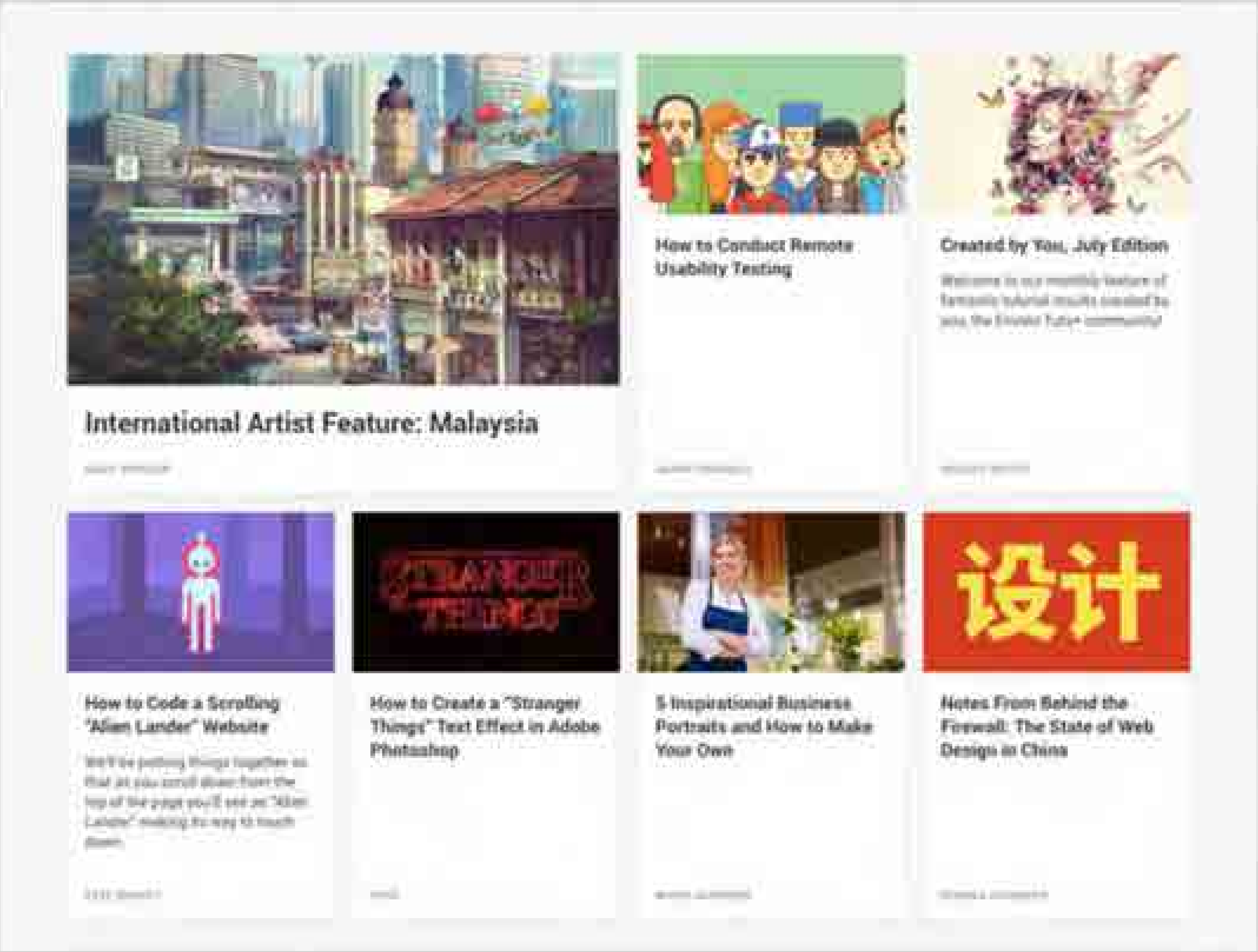
```
.wrapper {
  display: grid;
  grid-template-columns:
      repeat(4, fr);
}
```

```
.wrapper li:nth-child(2) {
  align-self:  center;
}
.wrapper li:nth-child(3) {
  align-self: start;
}
.wrapper li:nth-child(4) {
  align-self:  end;
}
```

http://codepen.io/airen/full/NbypvV/

Flexbox Layout Or Grid Layout?

- Flexbox Layout定义一个维度，行或者列
- Grid Layout定义两个维度，行和列



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http://www.w3cplus.com/css3/solving-problems-with-css-grid-and-flexbox-the-card-ui.html

http://codepen.io/airen/full/qqxrxP/

待续. . .

相关资料

- Grid规范：https://www.w3.org/TR/css-grid-1
- Box Alignment规范：https://www.w3.org/TR/css-align-3
- Flexbox规范：https://www.w3.org/TR/css-flexbox-1
- Flexbox教程:http://www.w3cplus.com/blog/tags/157.html
- Grid教程：http://www.w3cplus.com/blog/tags/355.html
- Grid案例：http://codepen.io/collection/XmZoNW
- Github：https://github.com/airen/grid-layout
- Grid更多资源：http://gridbyexample.com/

THANK YOU

W3C