

SAP UI5 Development Re-Introduction

2019.11

Michael Hu
michaelnny@gmail.com

Section 1

Web Development Introduction

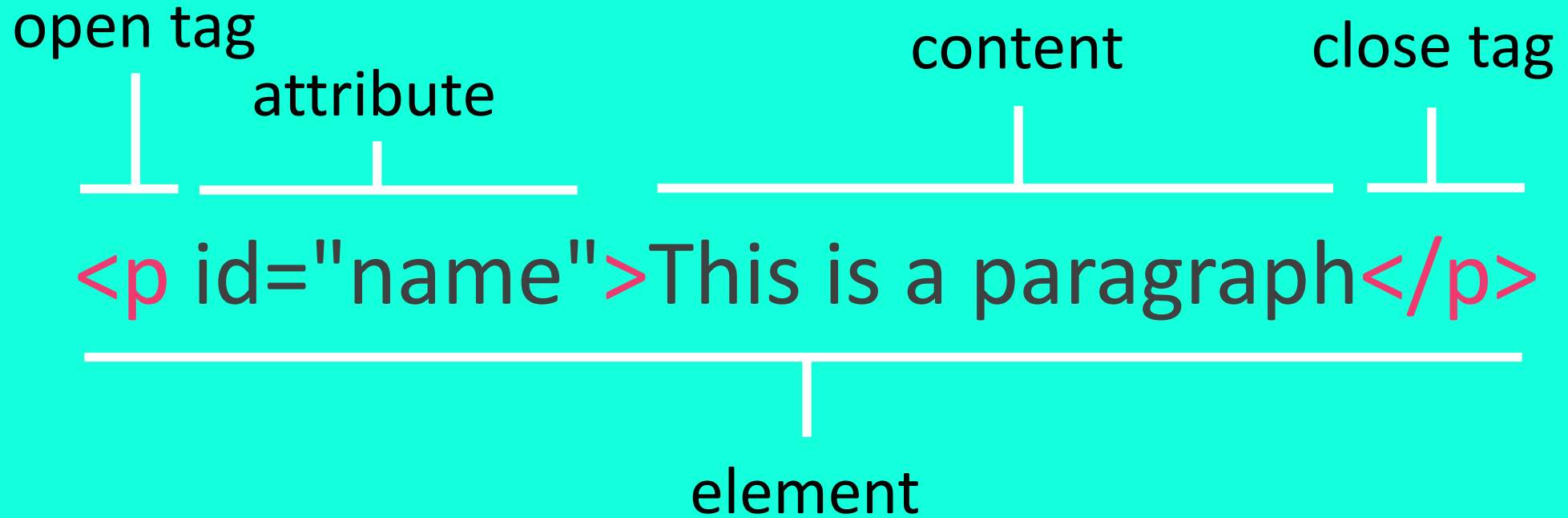
01 HTML

HTML

HTML (HyperText Markup Language) is the most basic building block of the Web. It defines the meaning and structure of web content.

<https://developer.mozilla.org/en-US/docs/Web/HTML>

Element



Attributes

Attributes are additional values that we use to configure the elements or adjust their behavior.

<https://developer.mozilla.org/en-US/docs/Web/HTML/Attributes>

HTML

- HTML syntax and structure
- Common elements
- Element attributes
- DOM

HTML Basics

- It **defines** the content of a webpage
- The latest version is **HTML5**
- **Elements** are the building block of HTML
- Surround element by **<** and **>**
- **Close** element with **</>**
- Use **attributes** to add additional information to element

HTML Syntax and Structure

```
<!DOCTYPE html>
<html>
  <head>
    <title>This is title</title>
  </head>
  <body>
  </body>
</html>
```

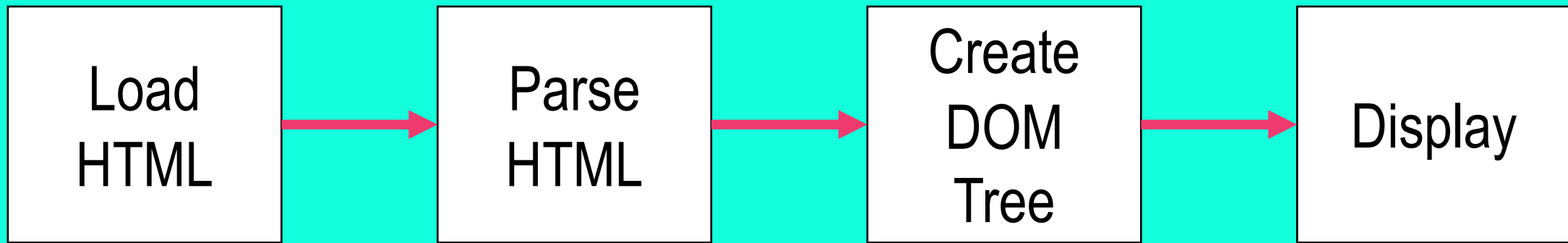
<!DOCTYPE html> tells browser this is a HTML5 document.

<html> beginning of the document.

<head> contains metadata about the document (title, scripts, and style sheets).

<body> content of the document

DOM



Browser convert HTML into a DOM (Document Object Model) tree model.

https://developer.mozilla.org/en-US/docs/Learn/CSS/First_steps/How_CSS_works

Some Links about HTML by MDN

HTML

<https://developer.mozilla.org/en-US/docs/Web/HTML>

HTML Reference

<https://developer.mozilla.org/en-US/docs/Web/HTML/Reference>

HTML Elements

<https://developer.mozilla.org/en-US/docs/Web/HTML/Element>

HTML Attributes

<https://developer.mozilla.org/en-US/docs/Web/HTML/Attributes>

02 CSS

CSS

CSS - Cascading Style Sheets.

We use CSS to style and lay out web pages.

For example: font, color, size, and spacing ...

What's CSS looks like

```
p {  
  font-size: 64px;  
  color: red;  
  border: 1px solid green;  
  padding: 10px;  
  margin: 20px;  
}
```


Color Value

```
p{  
  color: green;  
  color: rgb(0,128,0);  
  color: #008000;  
}
```


Length Value

px pixels

em factor of the **parent** element's font size (1em = 1x parent)

rem factor of the **root** element's font size <html>

For **em**, if the direct parent has no font-size defined, it'll look to upper-level parents until it reaches to root element

Use CSS in HTML - Inline

```
<!DOCTYPE html>
```

```
<html>
```

```
  <head>
```

```
  </head>
```

```
  <body>
```

```
    <p style="color:green; font-size:32px;">This is a text</p>
```

```
  </body>
```

```
</html>
```

Use CSS in HTML - Embedded

```
<!DOCTYPE html>
```

```
<html>
```

```
  <head>
```

```
    <style>
```

```
      p{...}
```

```
    </style>
```

```
  </head>
```

```
</html>
```

Use CSS in HTML – External File

```
<!DOCTYPE html>
```

```
<html>
```

```
  <head>
```

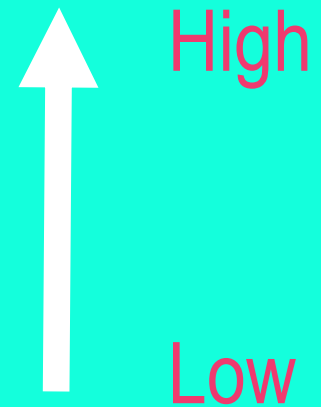
```
    <link rel="stylesheet" href="styles.css">
```

```
  </head>
```

```
</html>
```

CSS Selectors

- By Id Name (`#idName{ }`)
- By Class Name (`.className{ }`)
- By Element Type (`p{ }`)



CSS Box Model

Every element is an rectangular box.

https://www.w3schools.com/css/css_boxmodel.asp

CSS Layout Padding

```
#id{
```

```
padding: 50px;
```

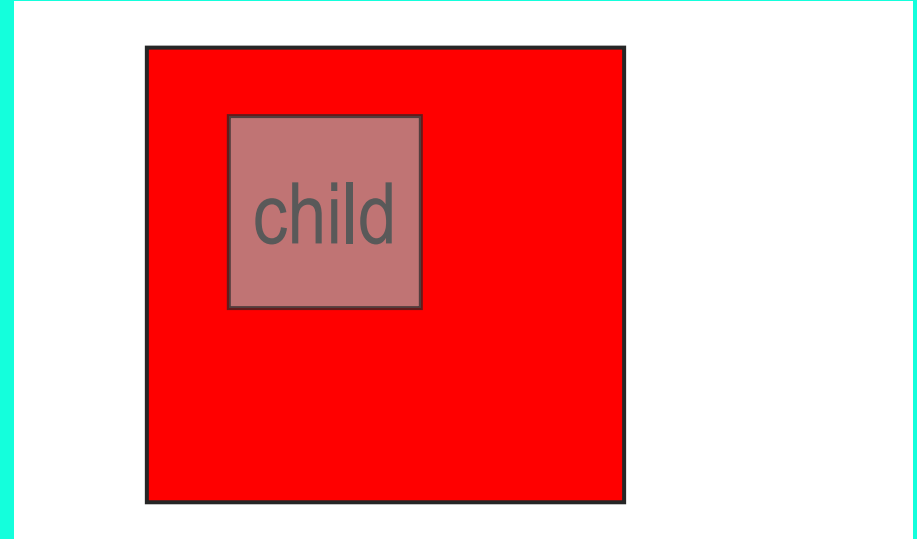
```
width: 200px;
```

```
height: 200px;
```

```
background-color: red;
```

```
border: 1px solid black;
```

```
}
```



Add 50px space inside border

CSS Layout Margin

```
#id{
```

```
margin: 50px;
```

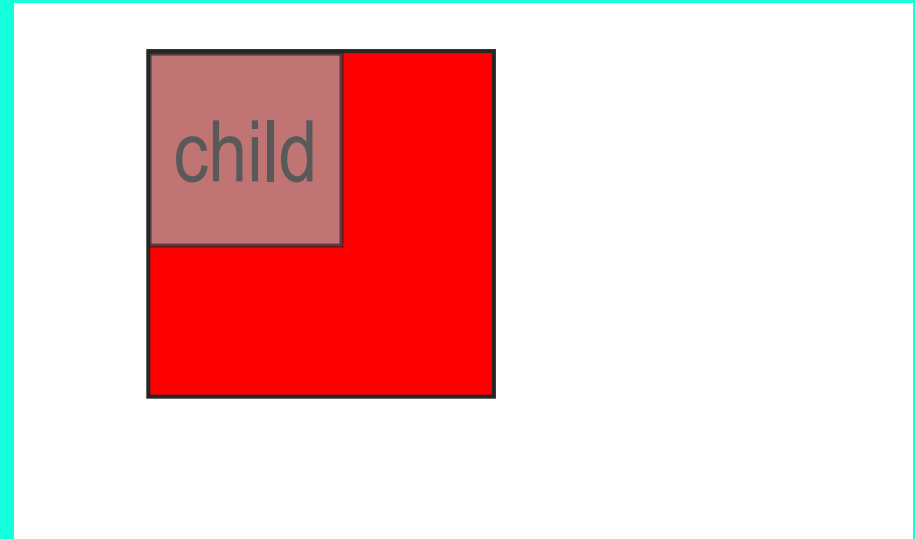
```
width: 200px;
```

```
height: 200px;
```

```
background-color: red;
```

```
border: 1px solid black;
```

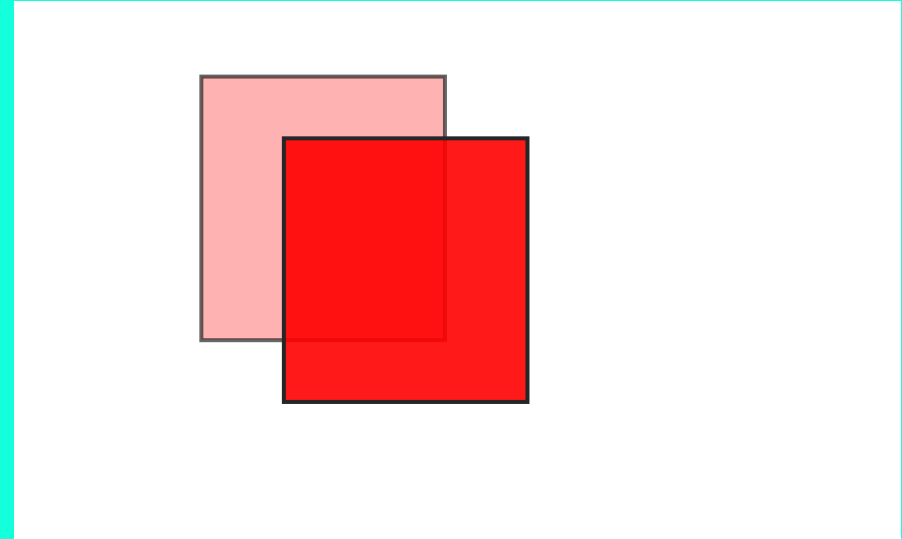
```
}
```



Add 50px space outside border

CSS Layout More

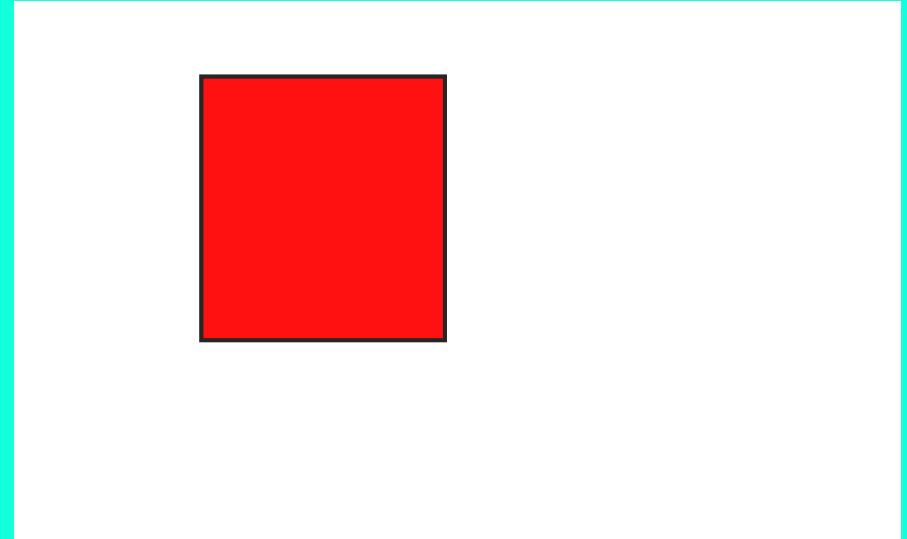
- `margin: 50px;`
- `margin: 50px 50px;`
- `margin: 50px 50px 50px 50px;`
- `margin-top: 50px;`
`margin-right: 50px;`
`margin-bottom: 50px;`
`margin-left: 50px;`



The four have the same effect: add 50px space outside border
Same rules apply to padding too

CSS Layout Position Relative

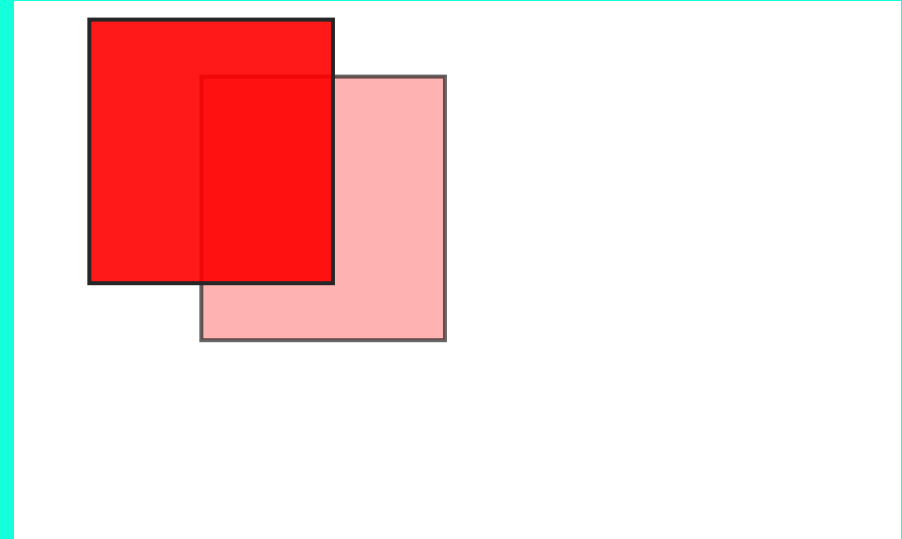
```
#id{  
    position: relative;  
    top: 10px;  
    left: 50px;  
    ...  
}
```



Move down 10px, right 50px
relative to its original position

CSS Layout Position Absolute

```
#id{  
    position: absolute;  
    top: 10px;  
    left: 50px;  
    ...  
}
```

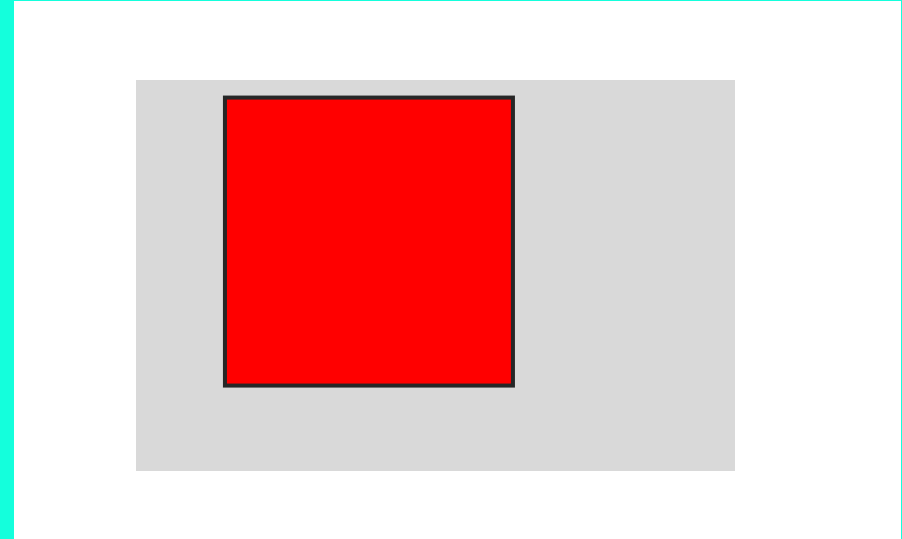


Move down 10px, right 50px from
parent element

CSS Layout Position Absolute

```
#parent{  
    position: relative;  
}
```

```
#id{  
    position: absolute;  
}
```

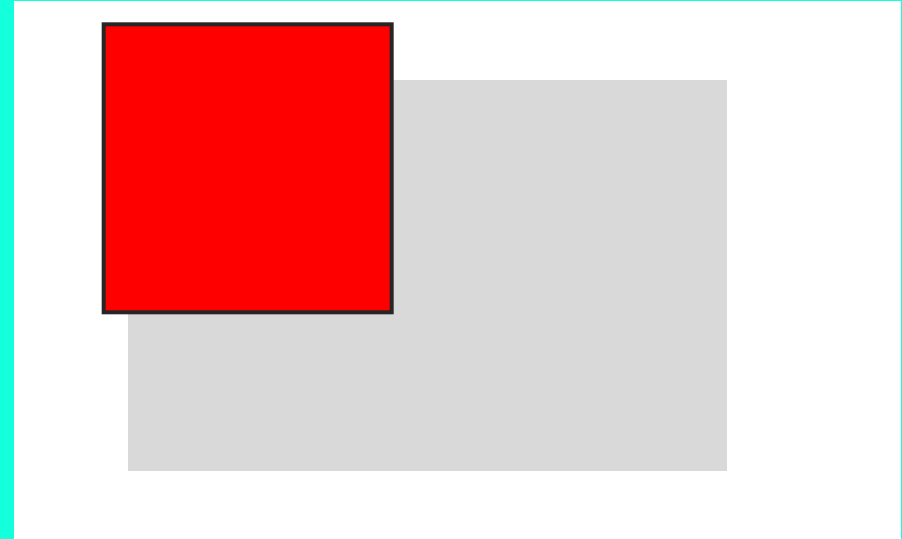


Move down 10px, right 50px from
parent element (gray box)

CSS Layout Position Fixed

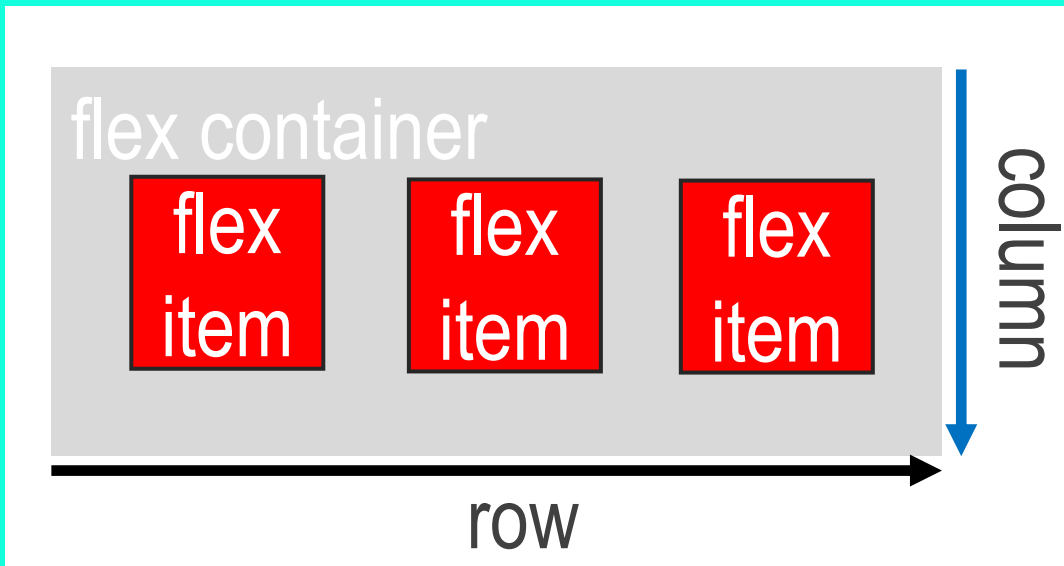
```
#parent{  
    position: relative;  
}
```

```
#id{  
    position: fixed;  
}
```



Move down 10px, right 50px from
root element

CSS Layout FlexBox



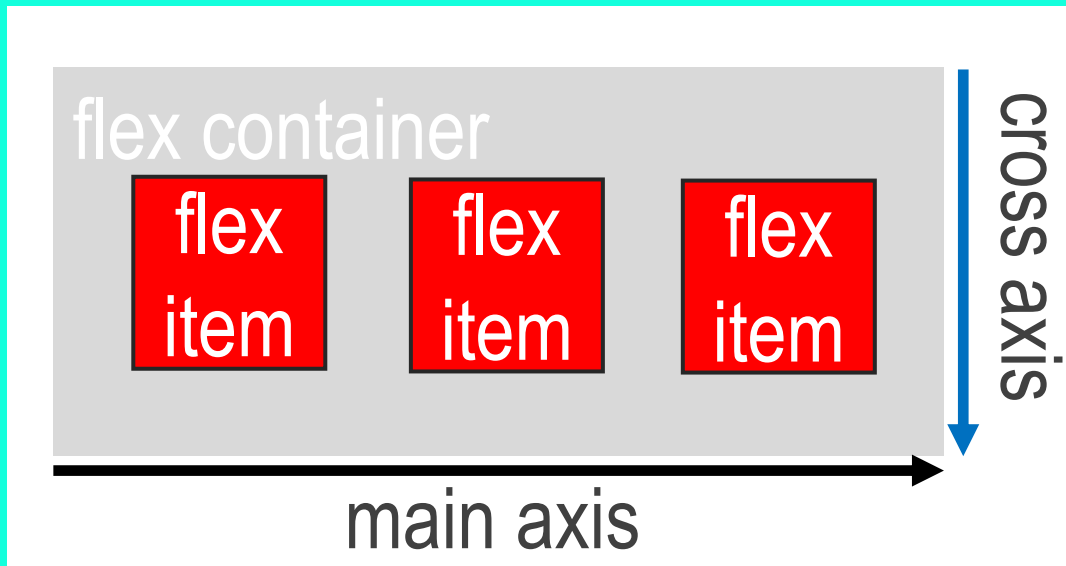
`display:flex` on parent element to enable flex

`flex-direction` to control how to laying the items:

row (left-right)

column (top-down)

CSS Layout FlexBox

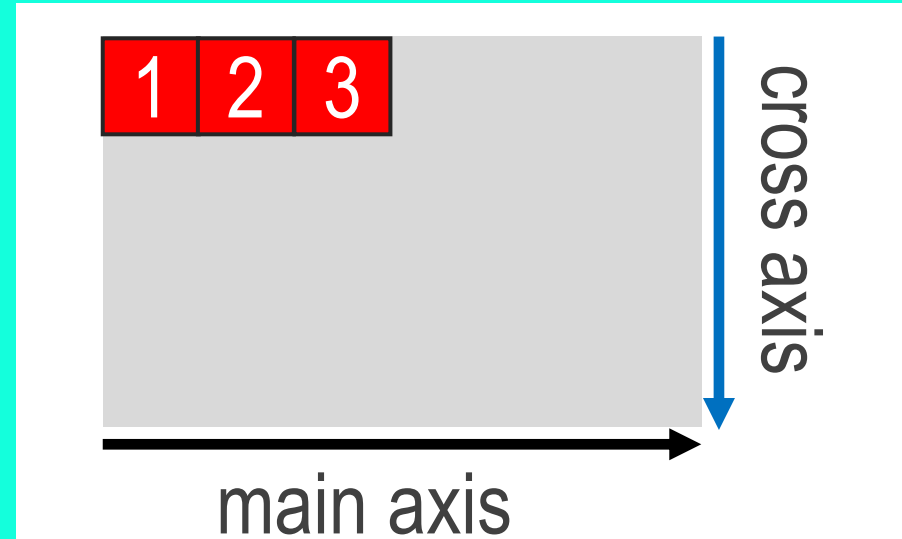


main axis is the flex-direction of flex container

cross axis is the flip side of main

Flex direction row

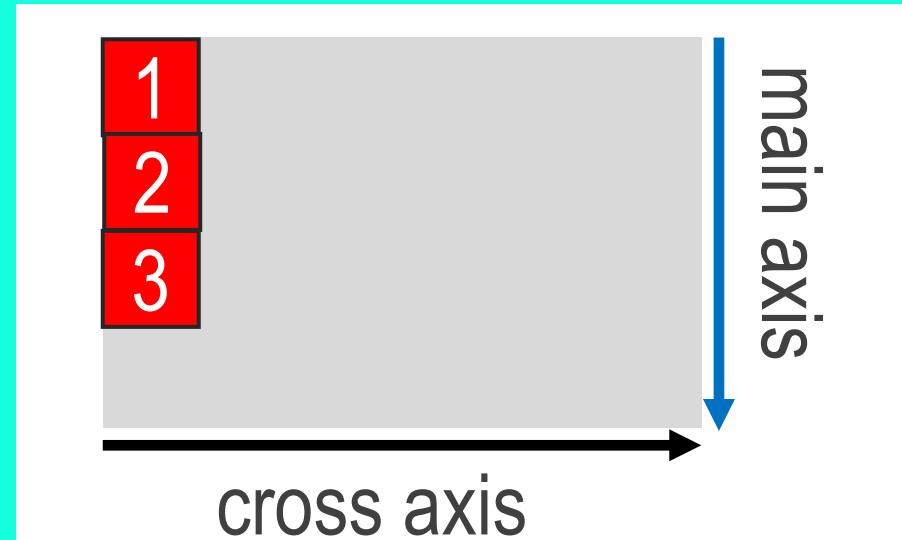
```
#parent{  
  display: flex;  
  flex-direction: row;  
}  
#child{  
  background-color: red;  
}
```



Flow flex item from left to right

Flex direction column

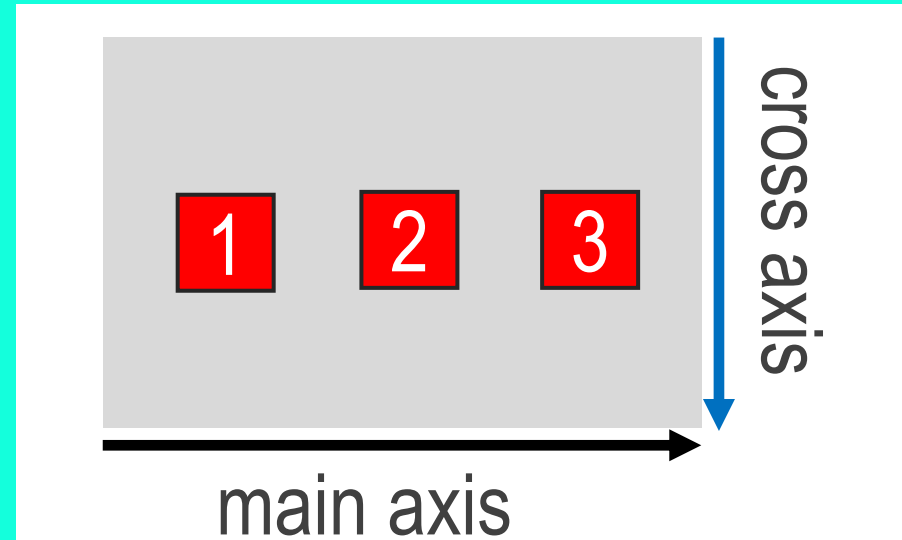
```
#parent{  
  display: flex;  
  flex-direction: column;  
}  
#child{  
  background-color: red;  
}
```



Flow flex item from top to bottom

Flex Alignment

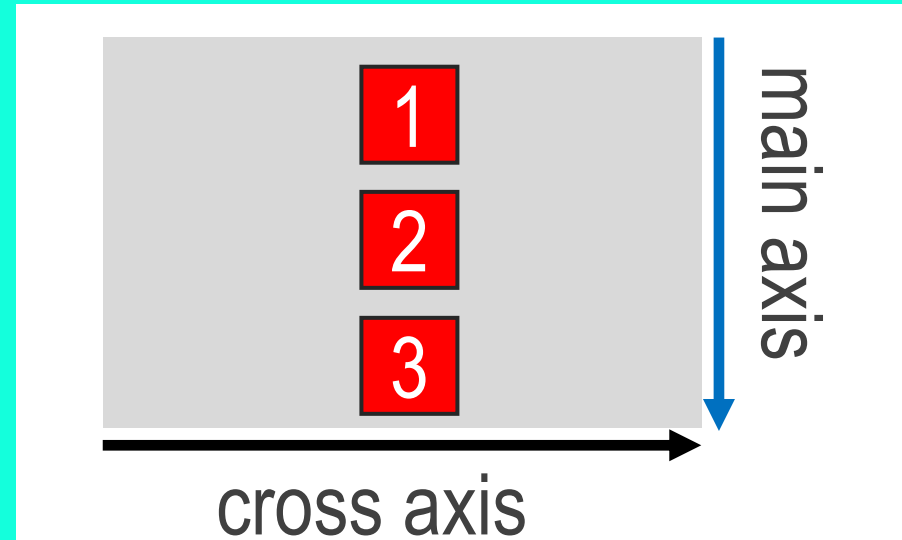
```
#parent{  
  display: flex;  
  flex-direction: row;  
  align-items: center;  
  justify-content: space-around;  
}
```



align-items controls the cross axis
justify-content controls the main axis

Flex Alignment

```
#parent{  
  display: flex;  
  flex-direction: column;  
  align-items: center;  
  justify-content: space-around;  
}
```



align-items controls the cross axis
justify-content controls the main axis

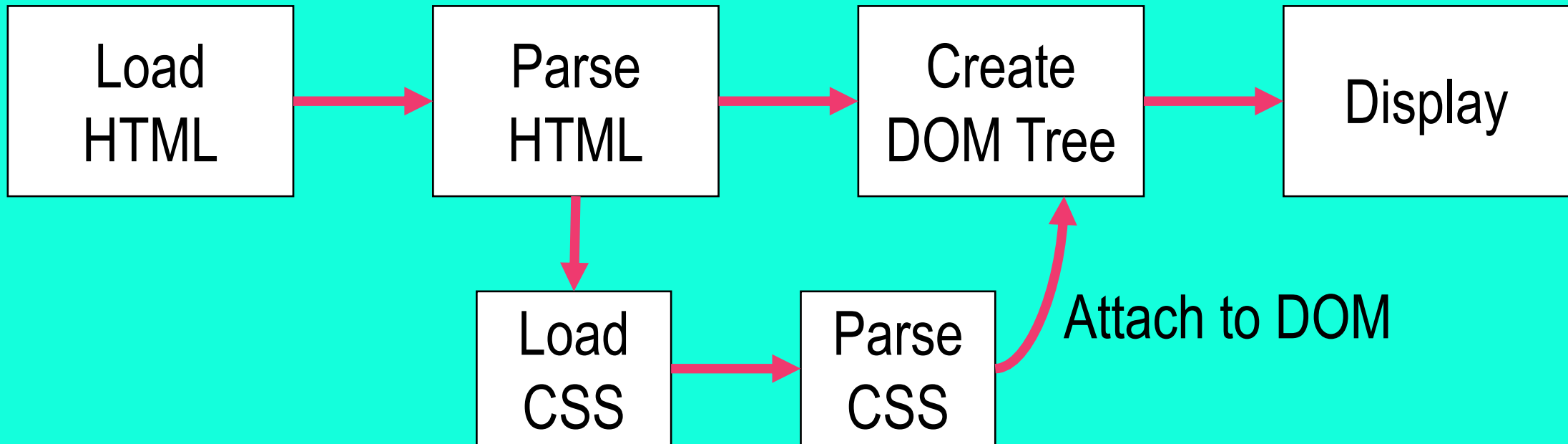
Responsive design

```
@media (max-width:599px) {  
  p{ font-size: 32px; }  
}
```

```
@media (min-width:600px) and (max-width:1023px) {  
  p{ font-size: 48px; }  
}
```

```
@media (min-width:1024px) {  
  p{ font-size: 64px; }  
}
```

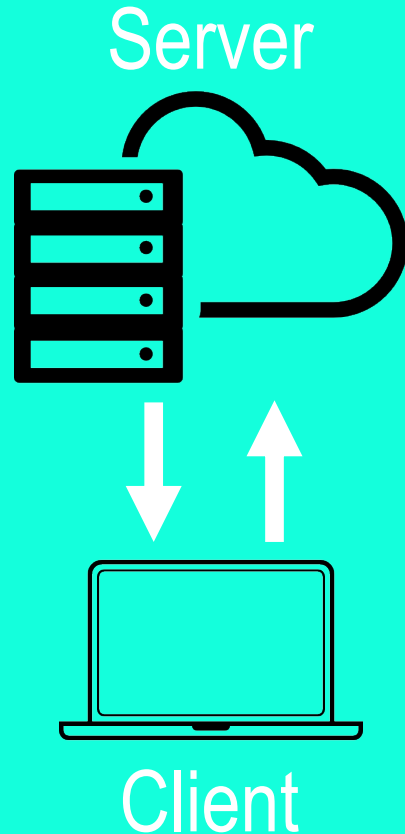

How CSS Works



https://developer.mozilla.org/en-US/docs/Learn/CSS/First_steps/How_CSS_works

Bonus HTTP HTTPS

HTML documents
Stylesheets
JavaScript
Images
Videos
Audios
...



HTTP handle communication between web browsers and web servers

HTTPS a secure version of the HTTP protocol, use SSL certificate to

Learn More

<https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview>

To Learn More about CSS

CSS building blocks

https://developer.mozilla.org/en-US/docs/Learn/CSS/Building_blocks

CSS selectors

https://developer.mozilla.org/en-US/docs/Learn/CSS/Building_blocks/Selectors

CSS values and units

https://developer.mozilla.org/en-US/docs/Learn/CSS/Building_blocks/Values_and_units

CSS @media

<https://developer.mozilla.org/en-US/docs/Web/CSS/@media>

Responsive design

https://developer.mozilla.org/en-US/docs/Web/Progressive_web_apps/Responsive/responsive_design_building_blocks

How CSS Works

Section 2 JavaScript

Web Development

HTML describe and define the content of a webpage

CSS change the appearance or presentation of content on a webpage

JavaScript handle behavior and functionality of a webpage

Data Types in JavaScript

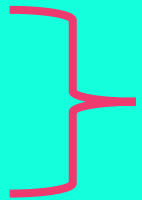
- Number
- String
- Boolean
- null
- undefined
- Object
 - Date
 - Array
 - Function

Declare Variables

- var

- const

- let



UI5 not support right now

Comparison

<	lesser than
>	greater than
<=	equal or lesser than
>=	equal or greater than

Equals

`==` equal

`!=` not equal

`===` strict equal

`!==` strict not equal

Functions

A function is a block of code that we put together to perform some specific task.

Functions

Define function

```
function myFunction(parameter1, parameter2, ...){  
    ...  
}
```

Execute function

```
myFunction()
```

Conditions

if-else ? :

if-else if-else if...else

switch

&& (and)

|| (or)

Loops

while

do-while

for

Async Await

```
async function(){  
  await ...  
}
```

Standard Events

<https://developer.mozilla.org/en-US/docs/Web/Events>

To learn more about JavaScript

JavaScript Introduction

https://developer.mozilla.org/en-US/docs/Web/JavaScript/A_re-introduction_to_JavaScript

Building Blocks

https://developer.mozilla.org/en-US/docs/Learn/JavaScript/Building_blocks

Section 3

UI5 Development Introduction

UI5 - Load Options

- `data-sap-ui-language="en"`
- `data-sap-ui-theme="sap_fiori_3"`
- `data-sap-ui-libs="sap.m"`
- `data-sap-ui-compatVersion="edge"`
- `data-sap-ui-xx-bindingSyntax="complex"`
- `data-sap-ui-debug="true"`
- `data-sap-ui-async="true"`
- `data-sap-ui-resourceroots='{ "namespace.id": "./" }'`

What the **sap-ui-core.js** will do

- Initialize jQuery plugins for fundamental functionalities
- Create the sap global object
- sap.ui.core is ready
- Load theme related CSS resources (if theme defined)
- Other activities (load module, run module...)

XML View

```
<mvc:View  
xmlns:mvc="sap.ui.core.mvc"  
xmlns="sap.m">  
    <Text text="some text"/>  
</mvc:View>
```

Property Binding

```
{ firstName: "Michael", lastName: "Hu" }
```

```
<Text text="{firstName}"/>
```

```
<Text text="{lastName}"/>
```

Aggregation Binding

Contacts: [{ firstName: "Michael", lastName: "Hu" }, {...}, {...}, {...}]

```
<List items="{/Contacts}">  
  <Text text="{firstName}" />  
  <Text text="{lastName}" />  
</List>
```

Layout - Product Card

iPhone X \$899.99



★ 4.4/5

Release date

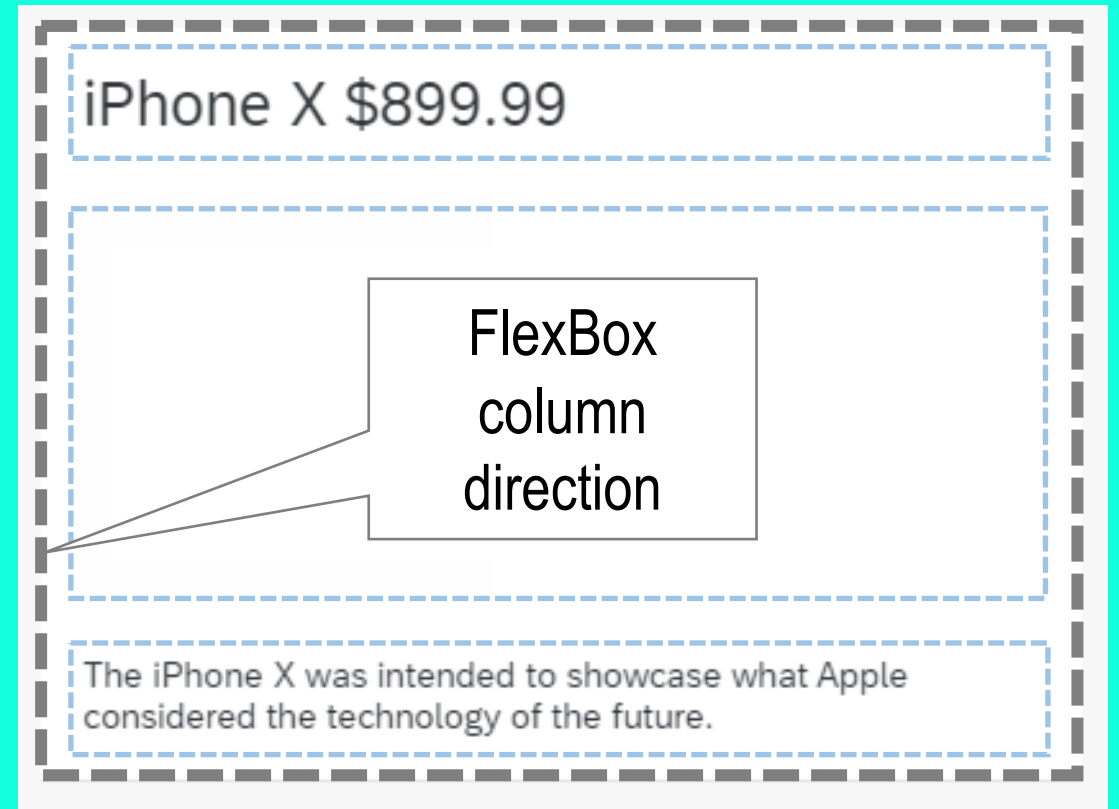
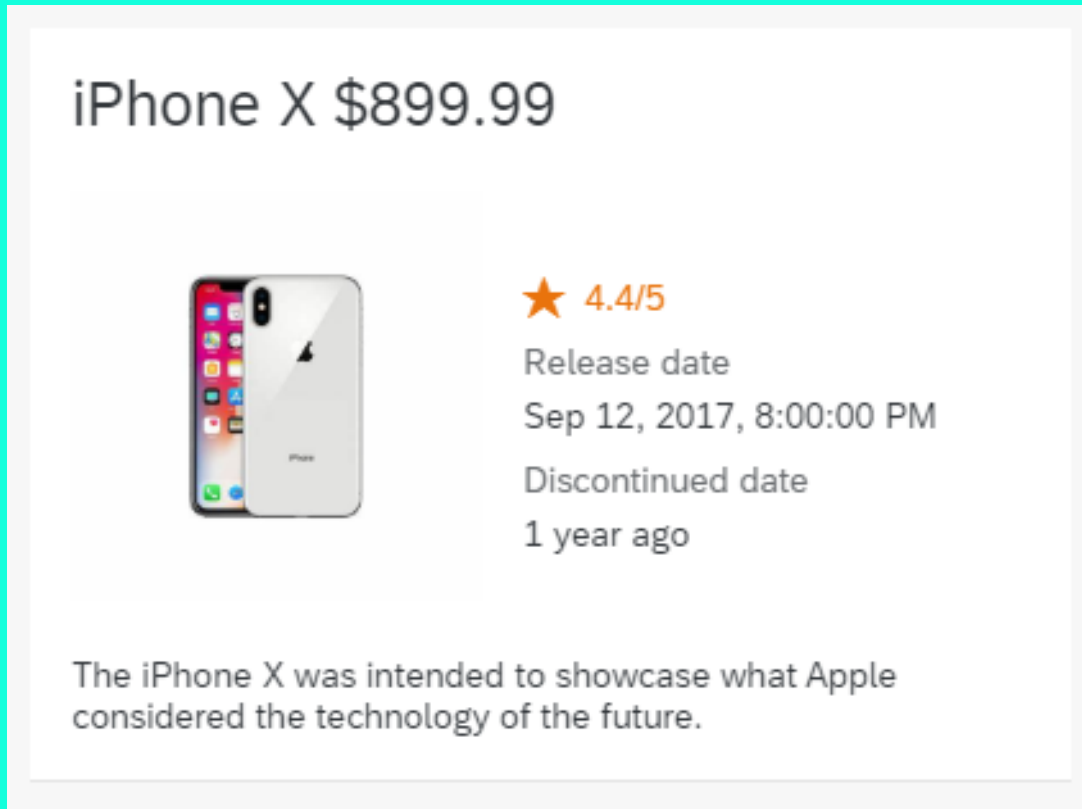
Sep 12, 2017, 8:00:00 PM

Discontinued date

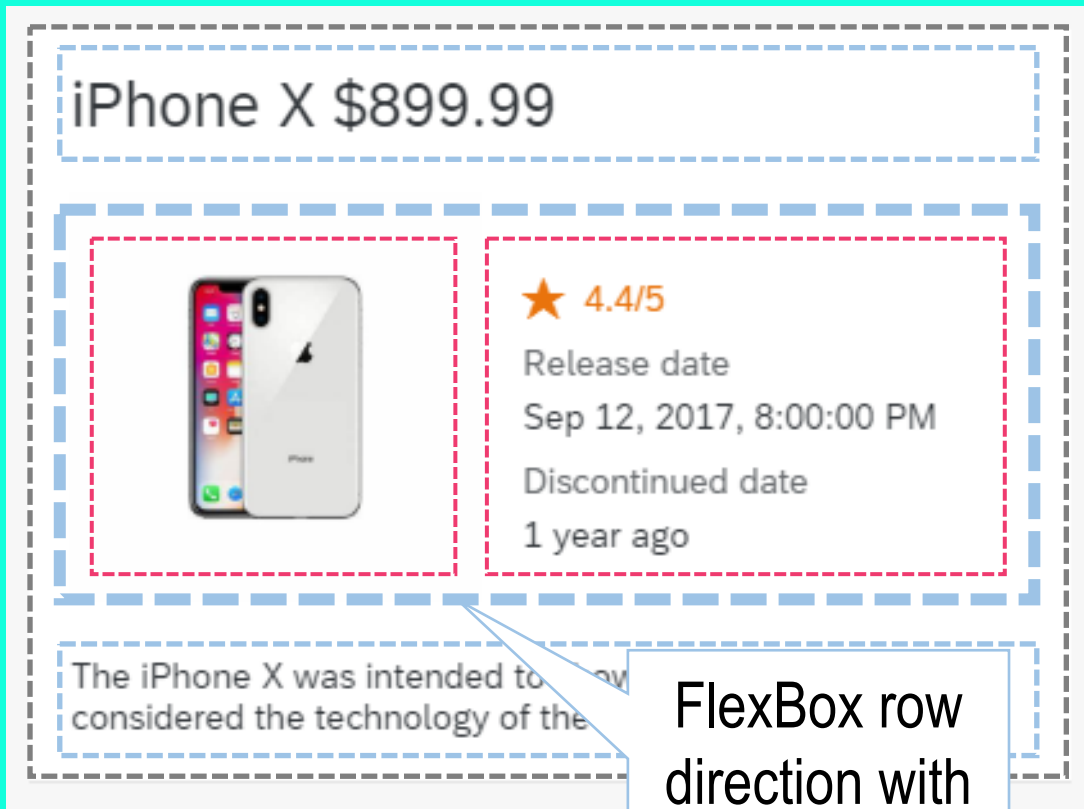
1 year ago

The iPhone X was intended to showcase what Apple considered the technology of the future.

Layout - Product Card



Layout - Product Card



FlexBox row
direction with
two columns



FlexBox
column
direction

Layout - Product Card

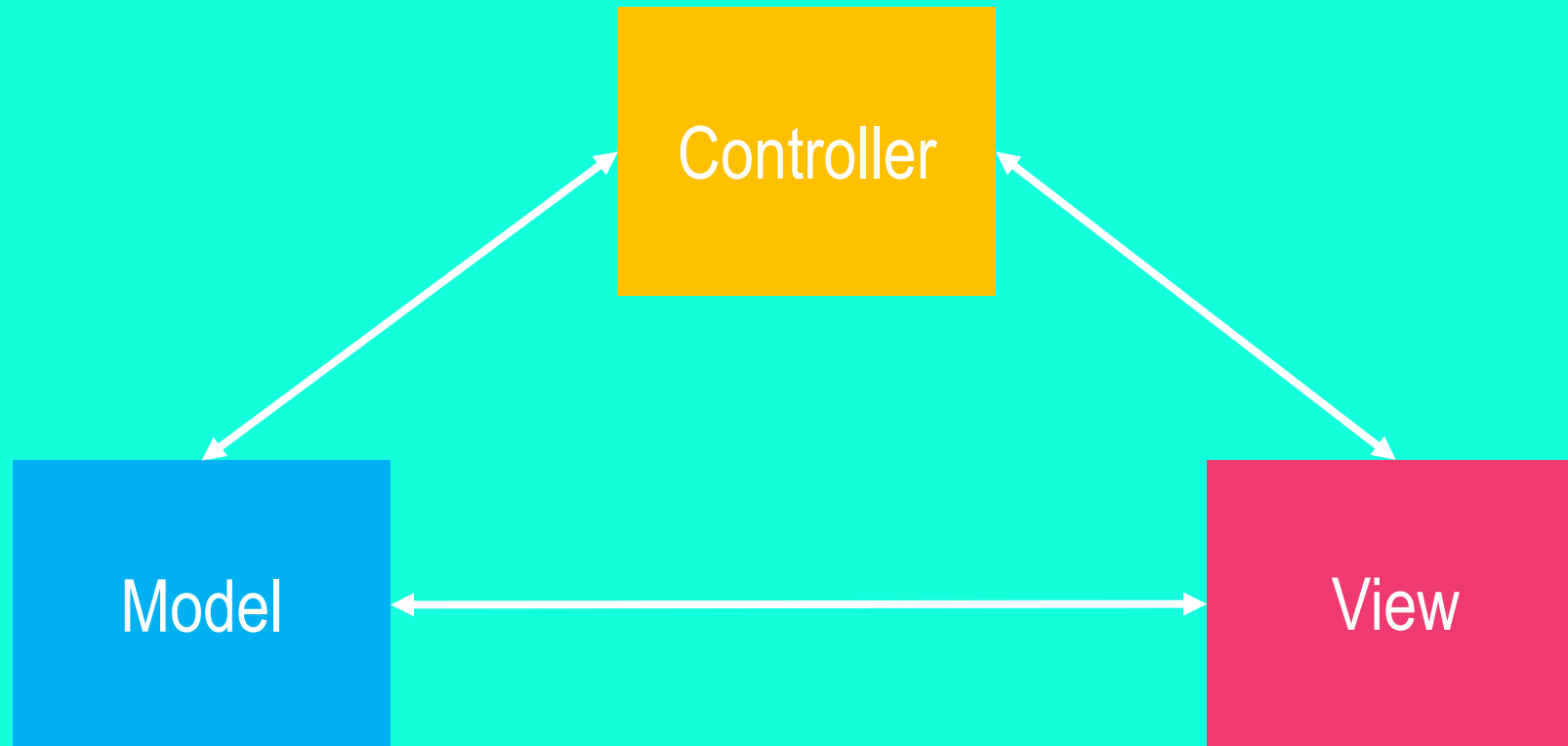


FlexBox column direction

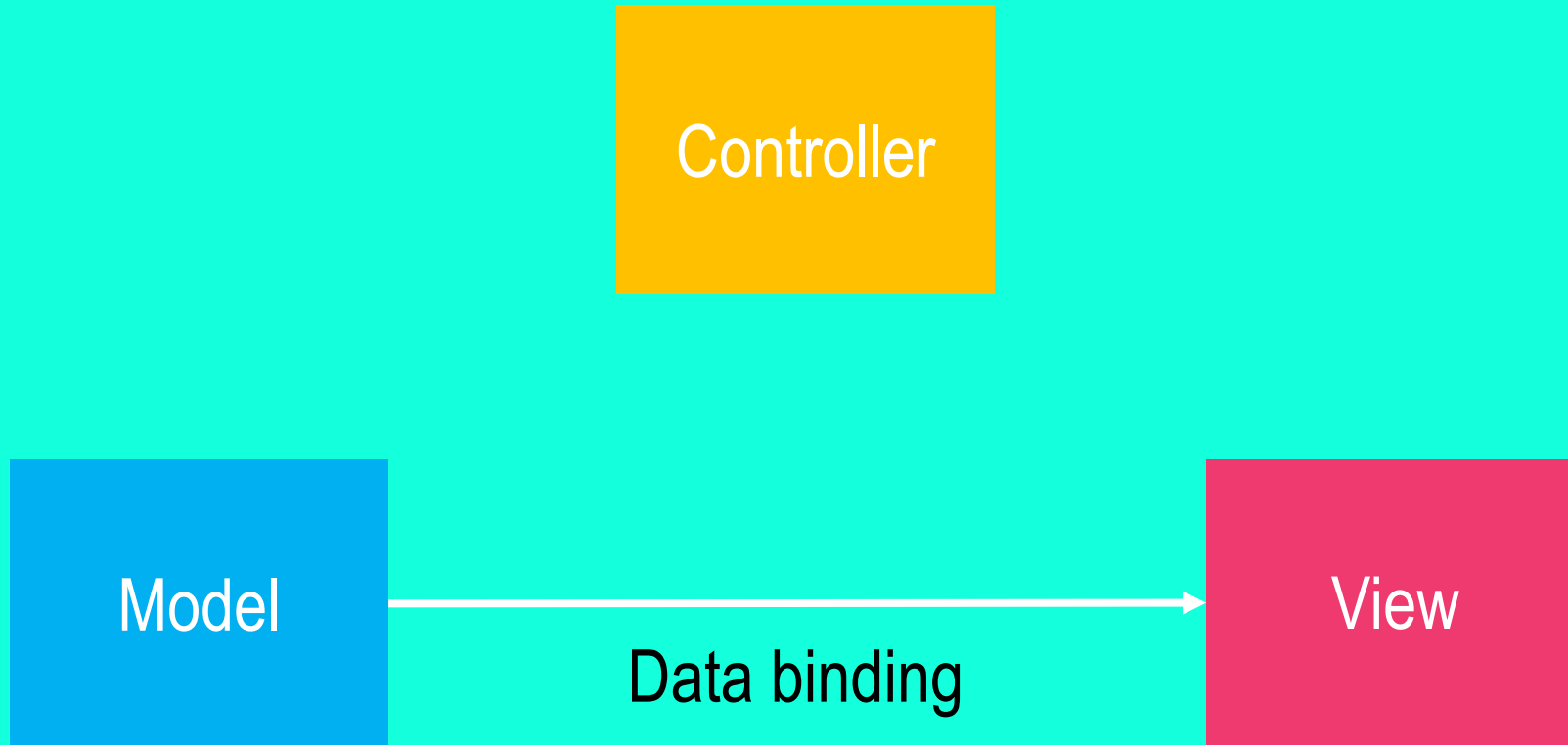
FlexBox row direction

FlexBox column direction

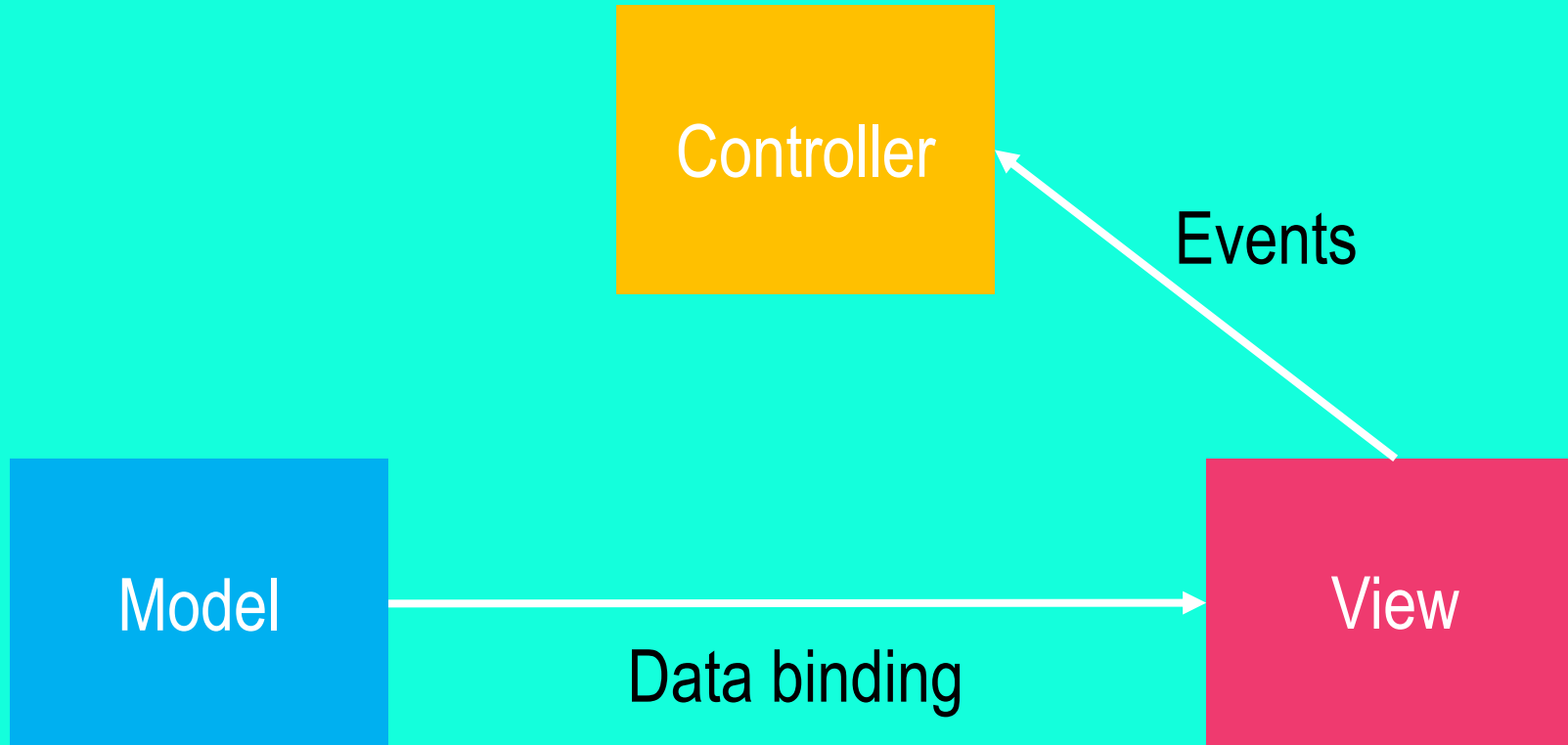
MVC in UI5



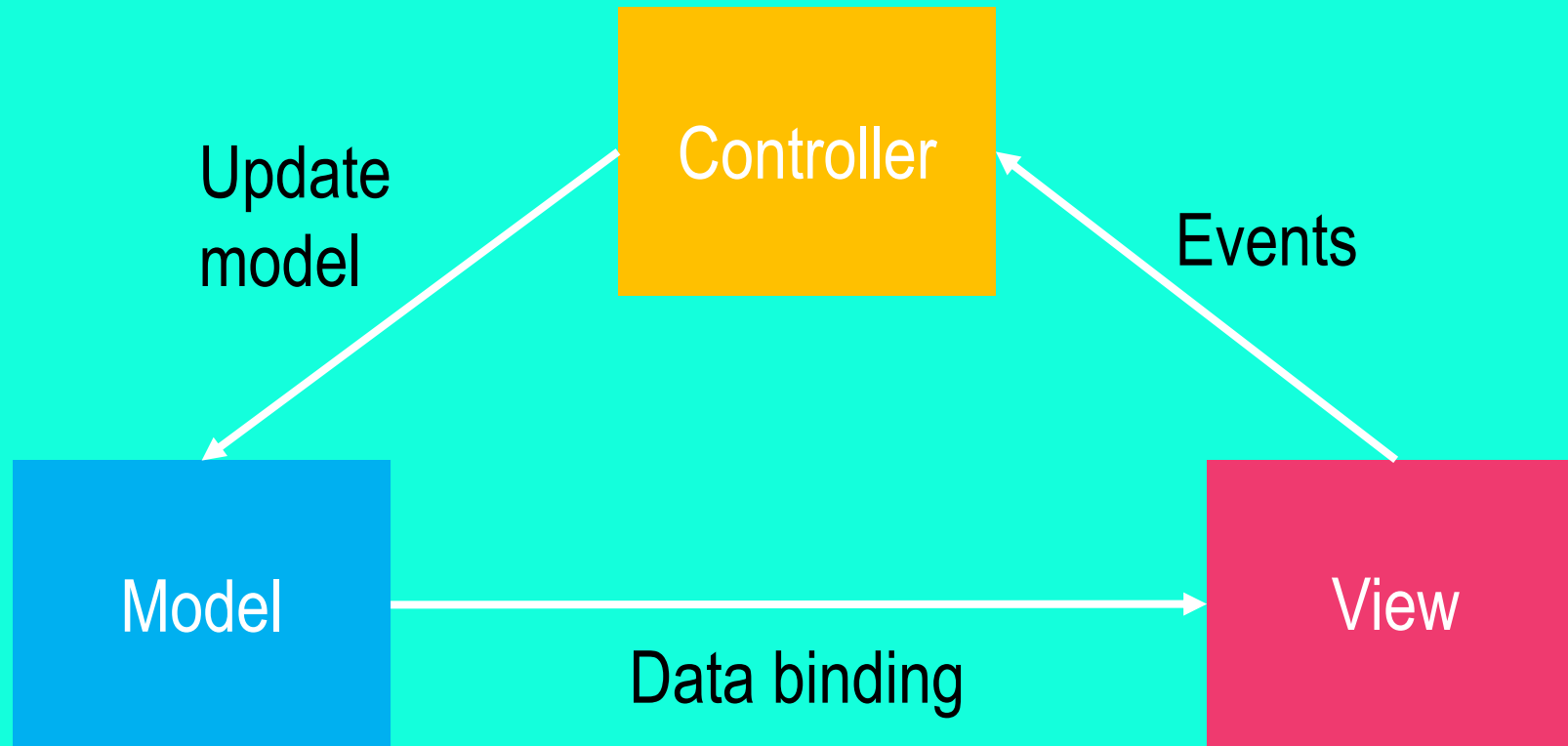
MVC in UI5



MVC in UI5



MVC in UI5



To learn more UI5

API Reference

<https://sapui5.hana.ondemand.com/#/api>

Quick Walkthrough

<https://sapui5.hana.ondemand.com/#/topic/3da5f4be63264db99f2e5b04c5e853db>

MVC

<https://sapui5.hana.ondemand.com/#/topic/91f233476f4d1014b6dd926db0e91070>

Section 4

Develop UI5 Applications with SAP Web IDE

Sample Fiori Launchpad URL

Fiori Launchpad 3.0

<https://sapui5.hana.ondemand.com/test-resources/sap/ushell/shells/demo/FioriLaunchpad.Fiori3.html>

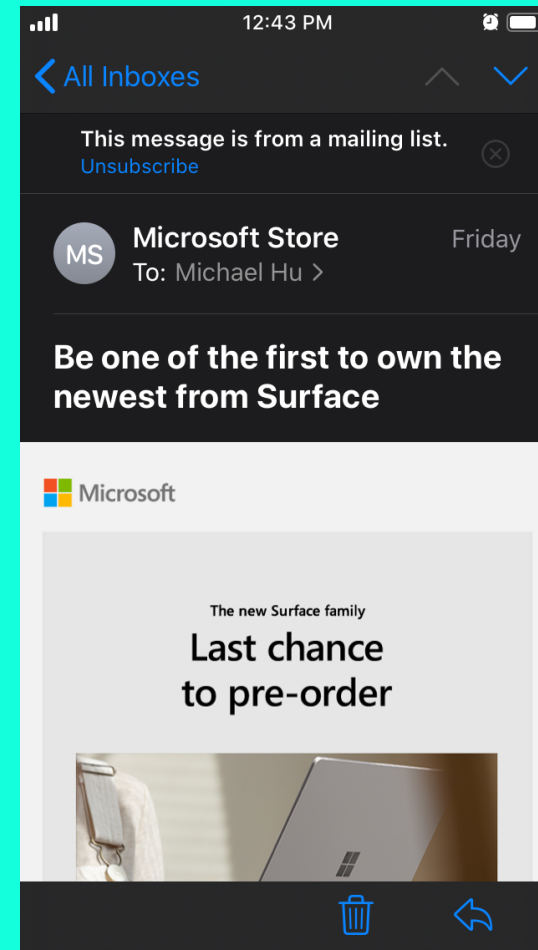
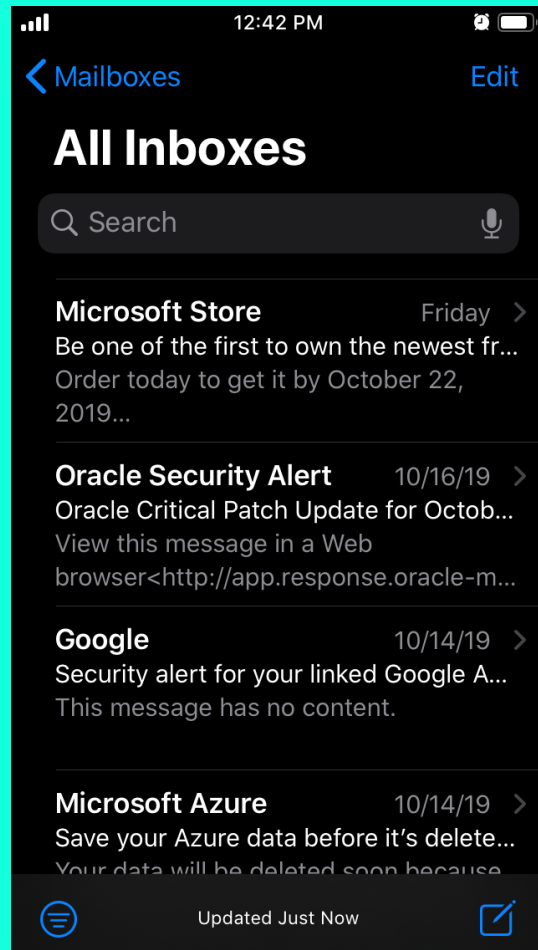
Fiori Launchpad 2.0

<https://sapui5.hana.ondemand.com/1.48.20/test-resources/sap/ushell/shells/demo/FioriLaunchpad.html#Shell-home>

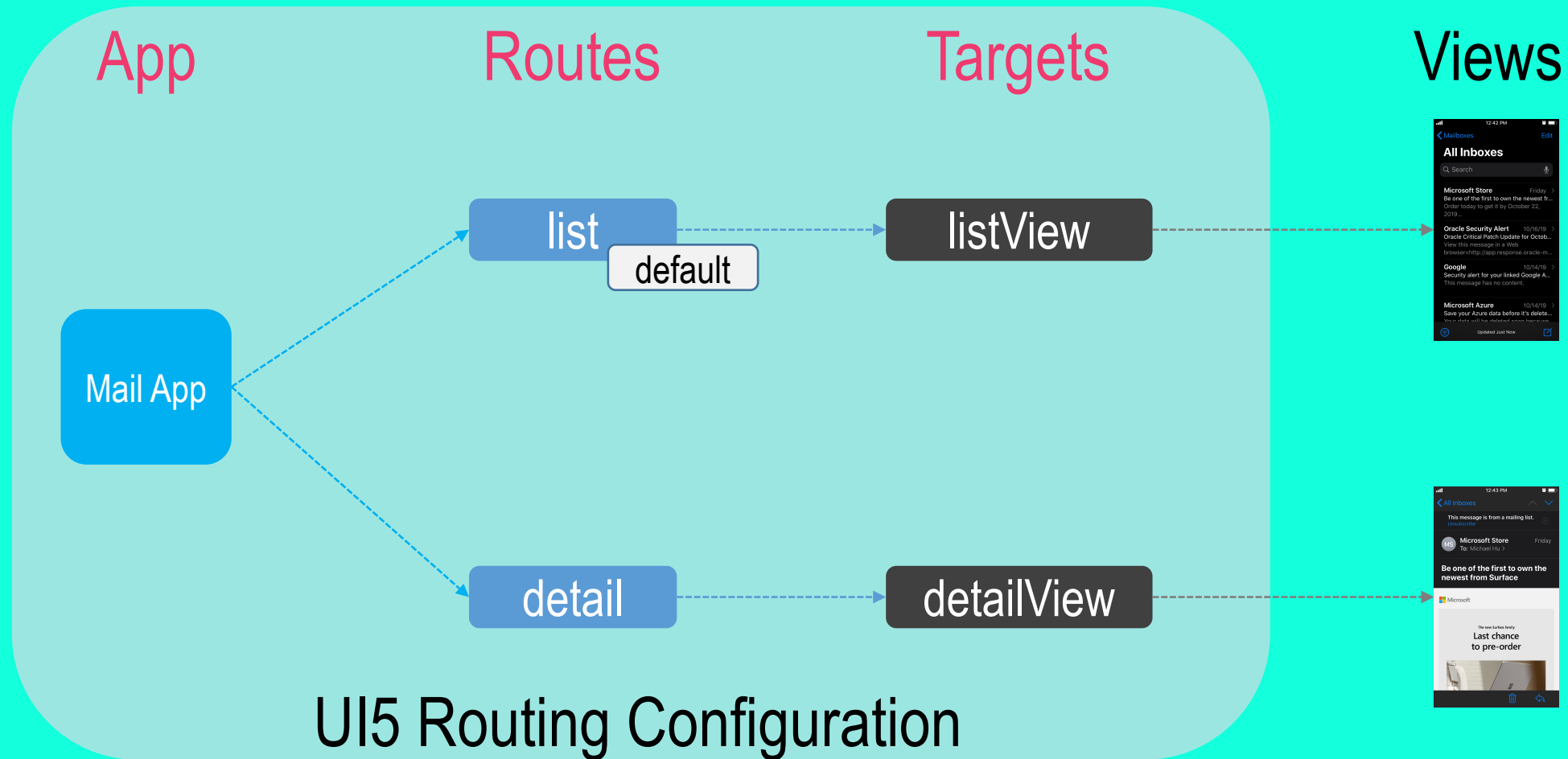
Fiori Launchpad 1.0

<https://sapui5.hana.ondemand.com/1.26.18/test-resources/sap/ushell/shells/demo/FioriLaunchpad.html#>

Navigation – Mail App



Routing and Navigation



To learn more about SAP Web IDE

SAP Web IDE Tutorials

<https://developers.sap.com/topics/sap-webide.html>

App Development with SAP Web IDE

<https://sapui5.hana.ondemand.com/1.36.6/docs/guide/13ced9493472408999143bc99bbb73b9.html>

Official SAP Web IDE YouTube Channel

https://www.youtube.com/channel/UCgScBj_AEGo_ml5accM4XhA/featured

Section 5

Use Real Data

Note about OData V4

- Binding all the way (function, action ...)
- Easy to use
- New data types (Edm.date, Edm.TimeOfDay)
- No CRUD
- No callFunction
- No metadata access
- Consum V2 service the V4 way (not fully supported)

To learn more ODATA

Sample service

<https://www.odata.org/odata-services>

Query Reference

<https://www.odata.org/getting-started/basic-tutorial/>

UI5 ODATA V4 model

<https://sapui5.hana.ondemand.com/#/topic/bcddbde6911bd4fc68fd435cf8e306ed0>

Section 6

Deployment

SAP Fiori Launchpad

Target Mapping

Tiles

Create
Product

Display
Product

Manage
Product

Semantic Object

MY_PRODUCT

UI5 Apps

demo.ui5.CreateProduct

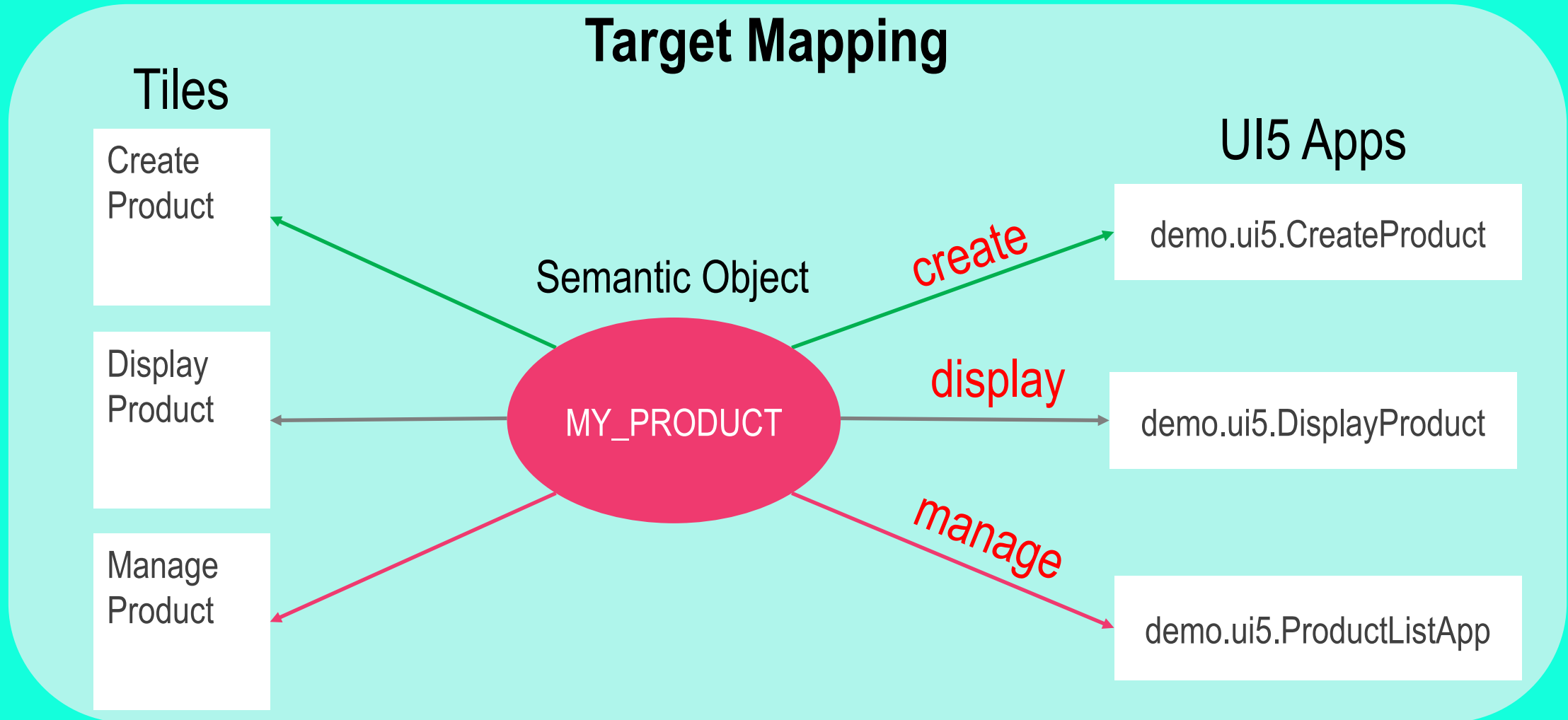
demo.ui5.DisplayProduct

demo.ui5.ProductListApp

create

display

manage



To learn more Deployment

SAP Fiori Launchpad

<https://experience.sap.com/fiori-design-web/launchpad/>

Setup SAP Fiori Launchpad on SAP NetWeaver AS ABAP System

<https://help.sap.com/viewer/a7b390faab1140c087b8926571e942b7/7.4.19/en-US>

SAP Fiori Launchpad on SAP Cloud

<https://wiki.scn.sap.com/wiki/pages/viewpage.action?pageId=448471273>

Other tools

Cors anywhere (resource from Internet)

<https://cors-anywhere.herokuapp.com>