

# **SAP UI5 Development Re-Introduction**

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# **Section 1**

## **Web Development Introduction**

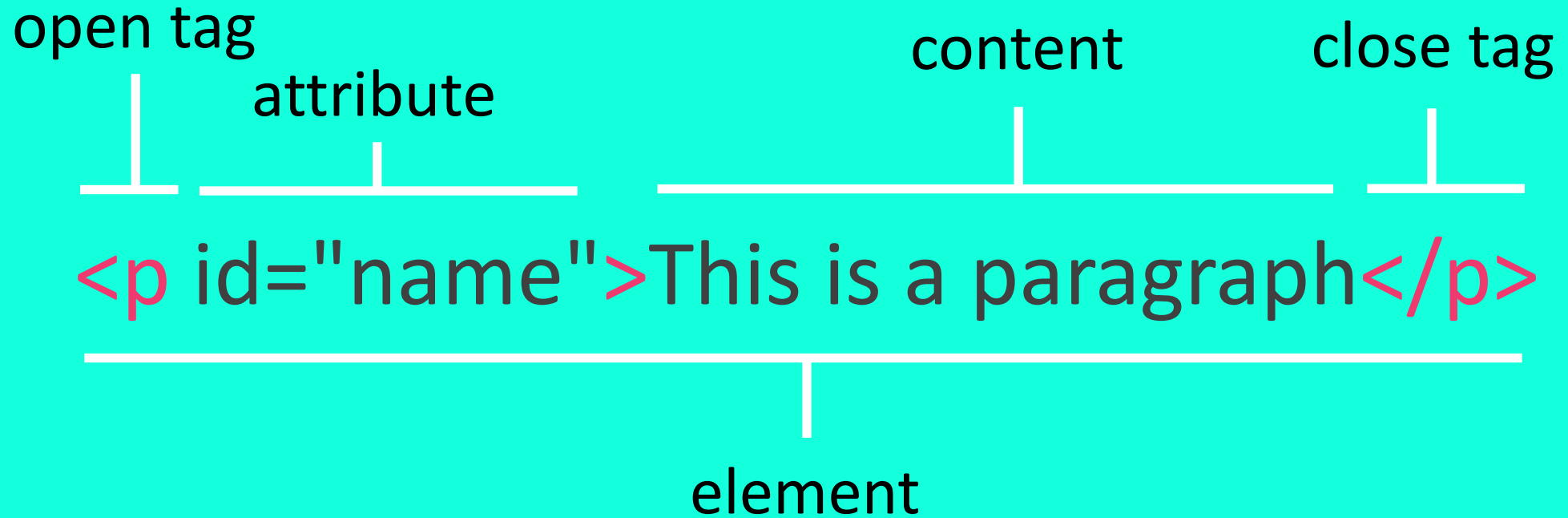
# 01 HTML

# 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>
```

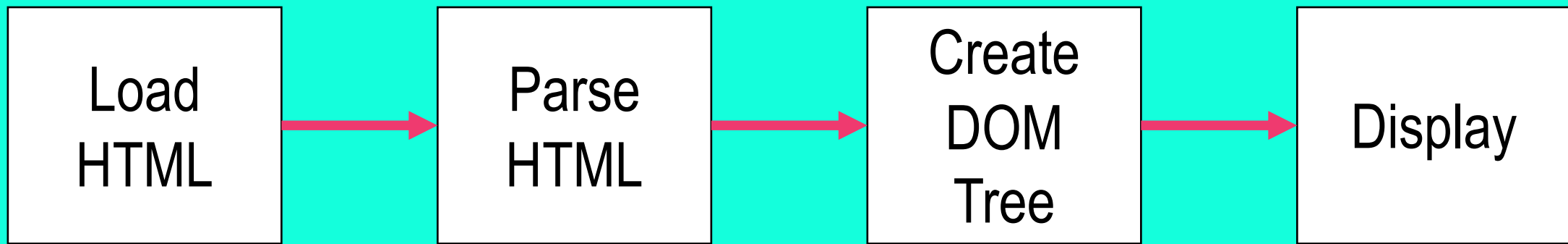
**<!DOCTYPE html>** tells browser this is a HTML5 document.

**<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](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>
```

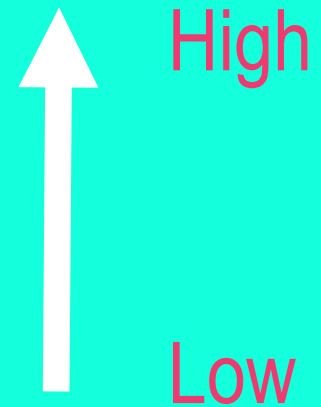
```
    <link rel="stylesheet" href="styles.css">
```

```
  </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](https://www.w3schools.com/css/css_boxmodel.asp)

# CSS Layout Padding

```
#id{
```

```
padding: 50px;
```

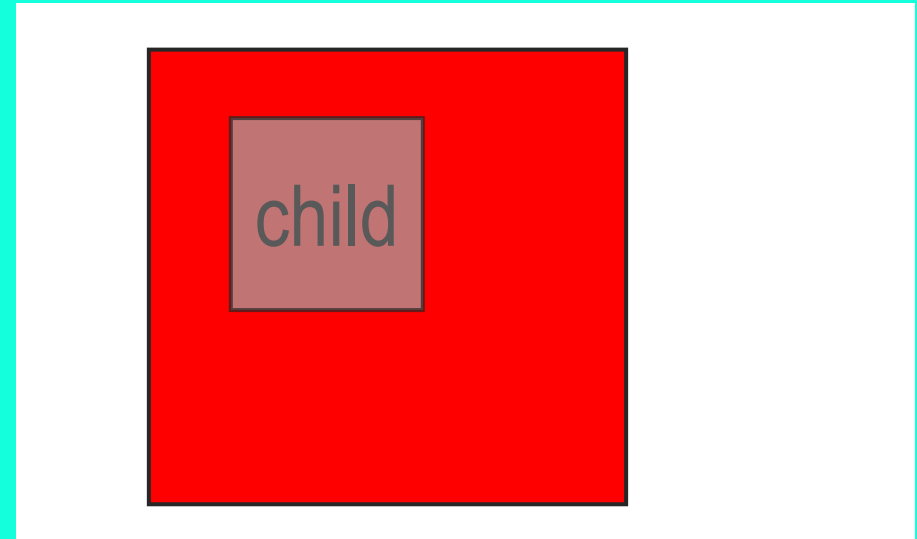
```
width: 200px;
```

```
height: 200px;
```

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

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

```
}
```



Add 50px space inside border

# CSS Layout Margin

```
#id{
```

```
margin: 50px;
```

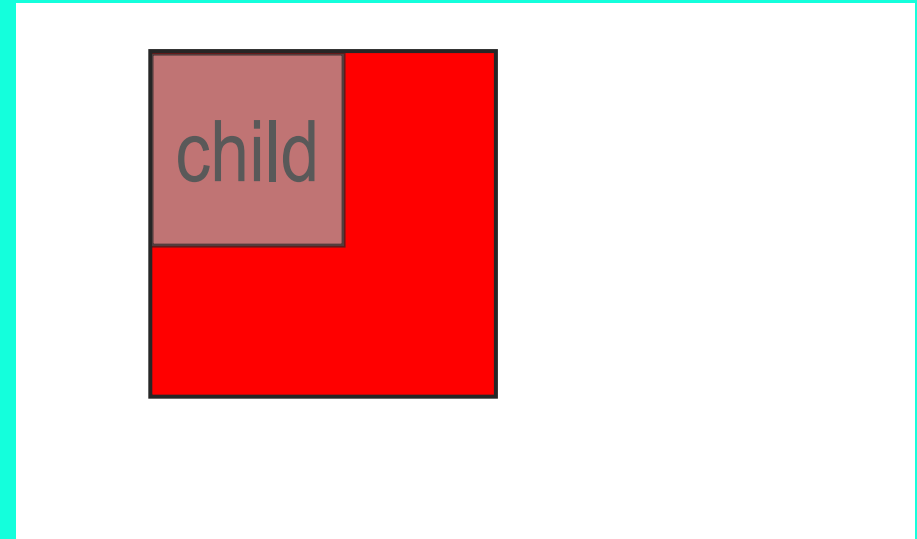
```
width: 200px;
```

```
height: 200px;
```

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

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

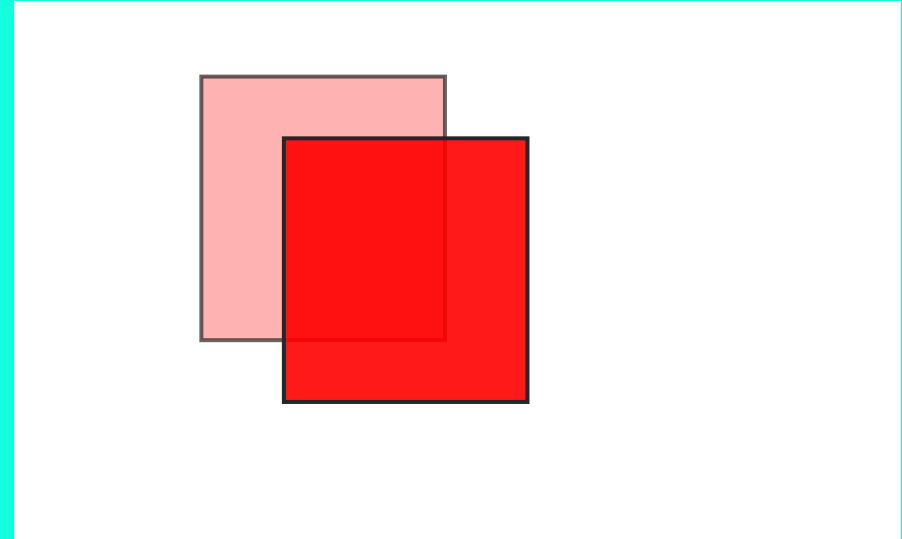
```
}
```



Add 50px space outside border

# CSS Layout More

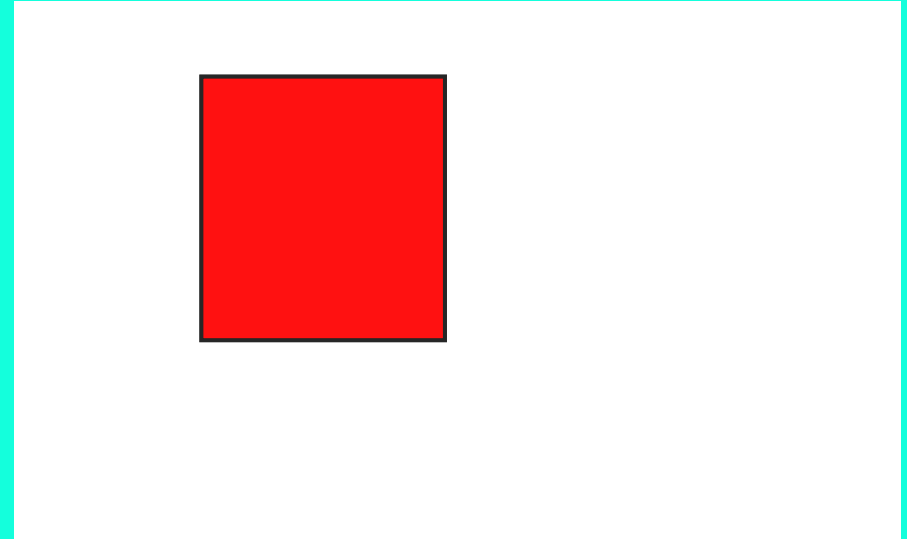
- `margin: 50px;`
- `margin: 50px 50px;`
- `margin: 50px 50px 50px 50px;`
- `margin-top: 50px;`  
`margin-right: 50px;`  
`margin-bottom: 50px;`  
`margin-left: 50px;`



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

# CSS Layout Position Relative

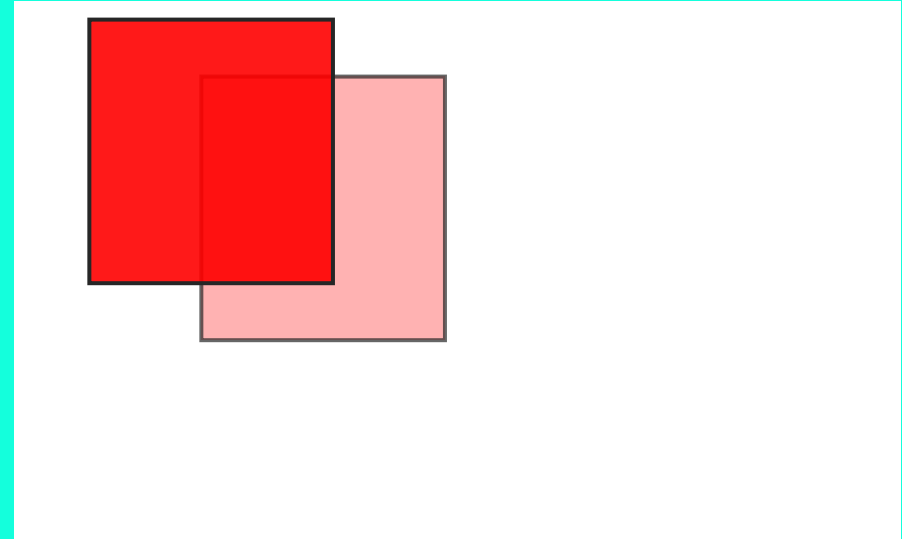
```
#id{  
    position: relative;  
    top: 10px;  
    left: 50px;  
    ...  
}
```



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

# CSS Layout Position Absolute

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



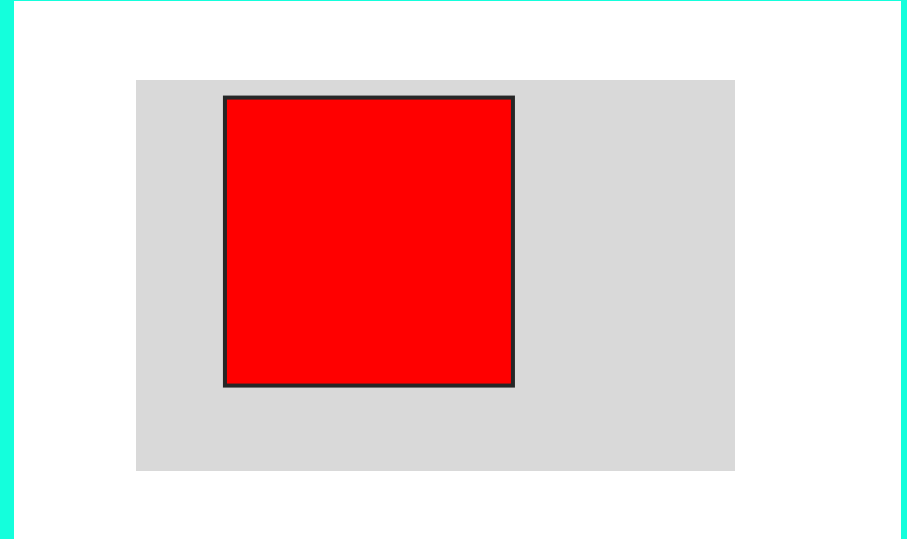
Move down 10px, right 50px from  
parent element



# CSS Layout Position Absolute

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

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

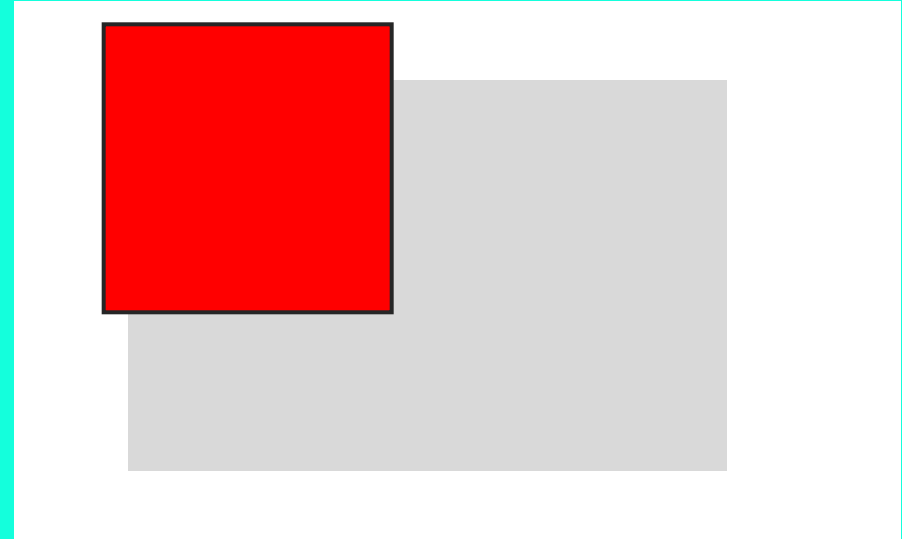


Move down 10px, right 50px from  
parent element (gray box)

# CSS Layout Position Fixed

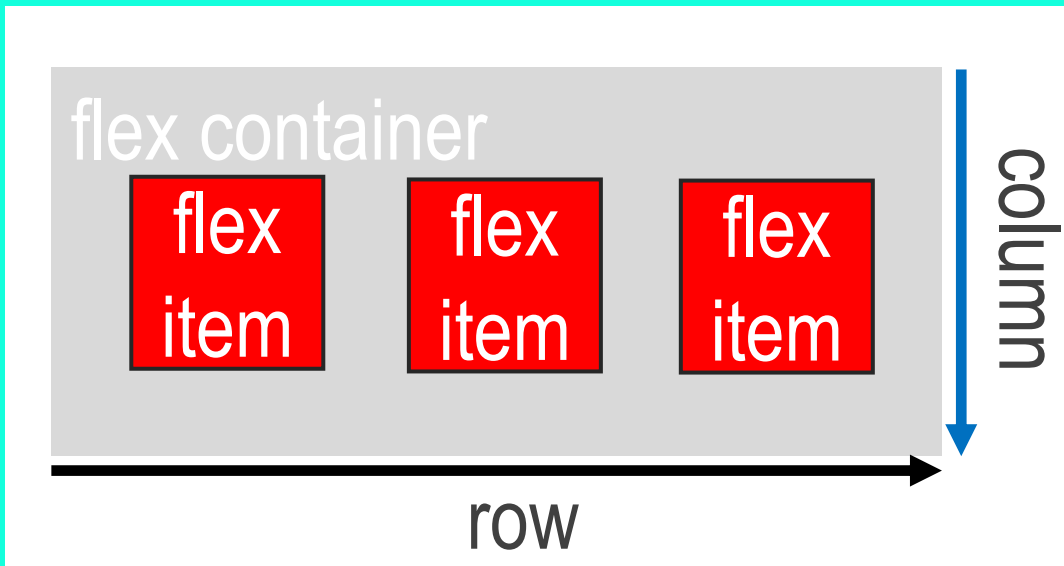
```
#parent{  
    position: relative;  
}
```

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



Move down 10px, right 50px from  
root element

# CSS Layout FlexBox



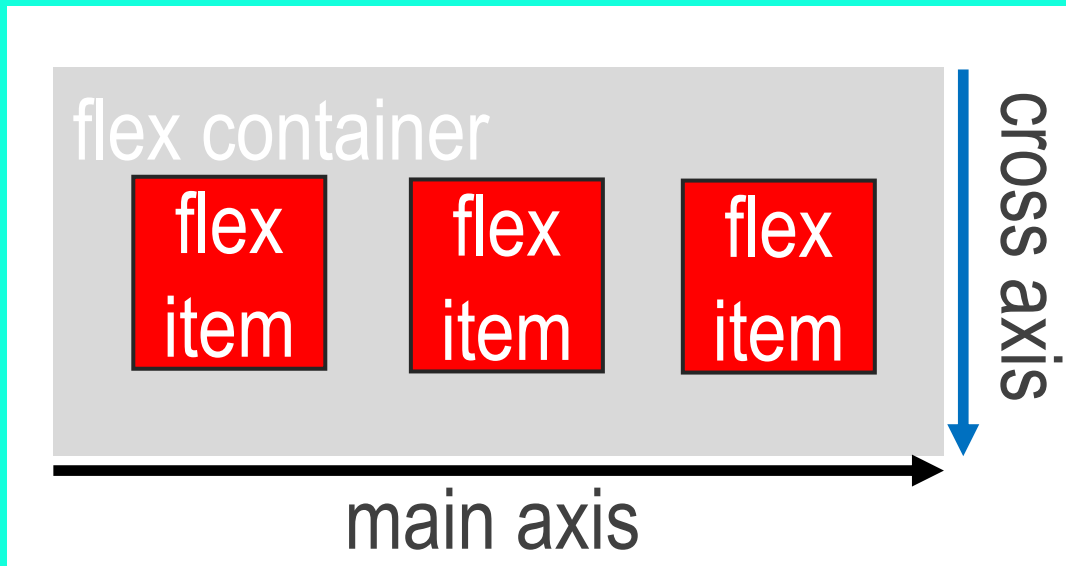
`display:flex` on parent element to enable flex

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

row (left-right)

column (top-down)

# CSS Layout FlexBox

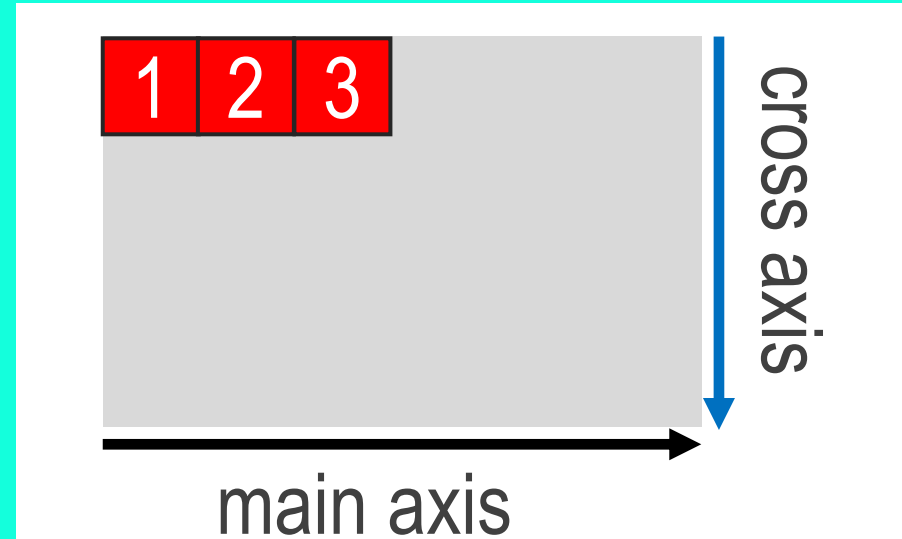


**main axis** is the flex-direction of flex container

**cross axis** is the flip side of main

# Flex direction row

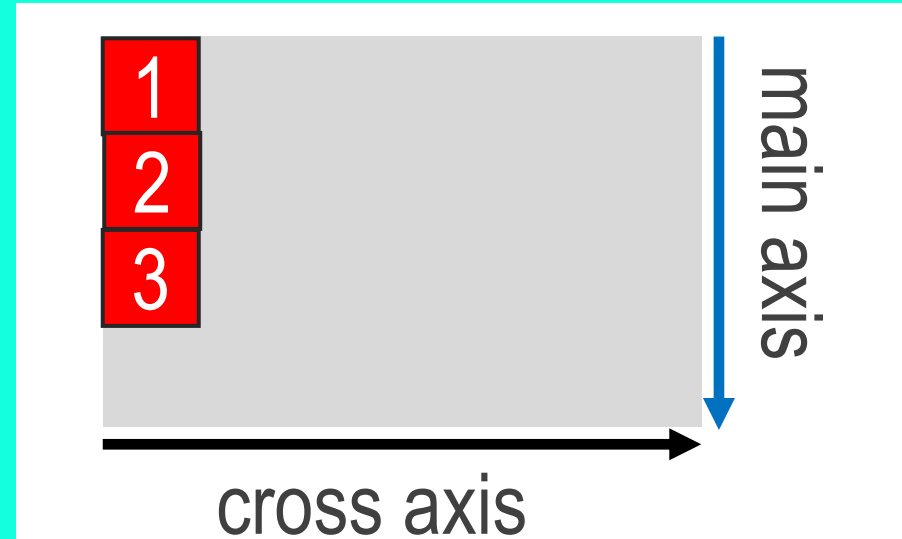
```
#parent{  
  display: flex;  
  flex-direction: row;  
}  
#child{  
  background-color: red;  
}
```



Flow flex item from left to right

# Flex direction column

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

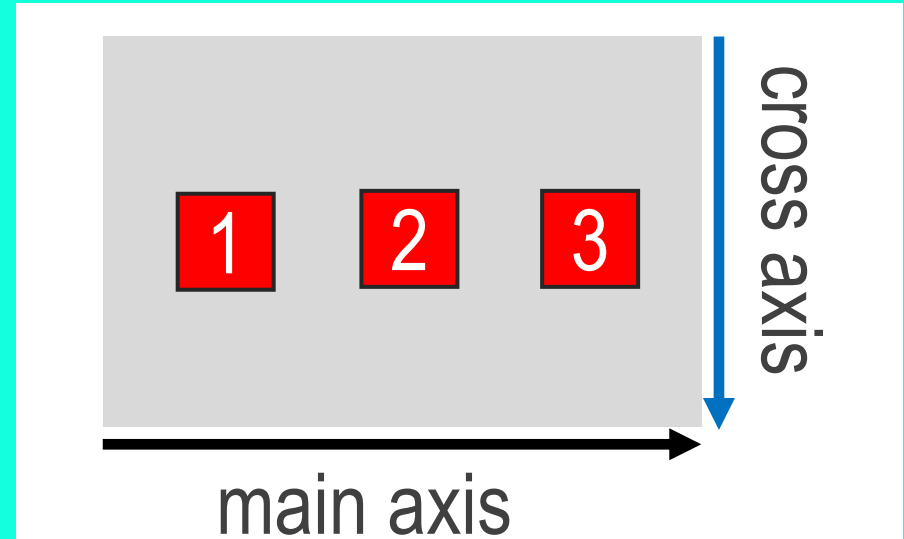


Flow flex item from top to bottom



# Flex Alignment

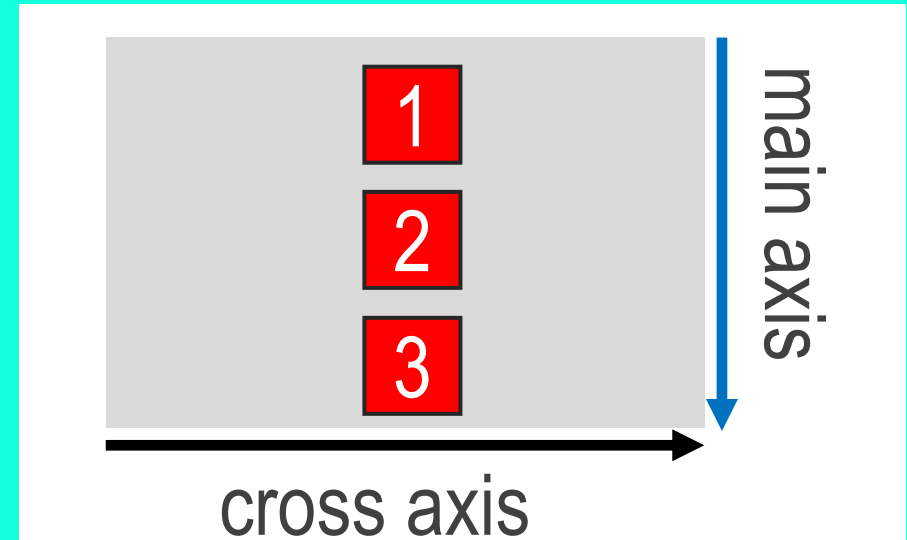
```
#parent{  
  display: flex;  
  flex-direction: row;  
  align-items: center;  
  justify-content: space-around;  
}
```



**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

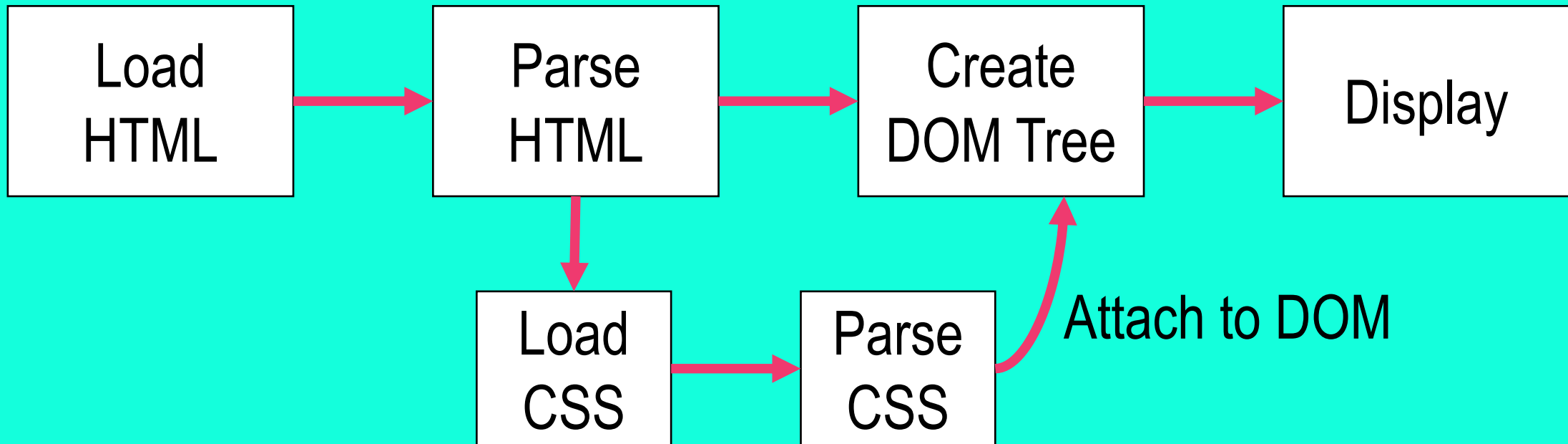
# Responsive design

```
@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; }  
}
```

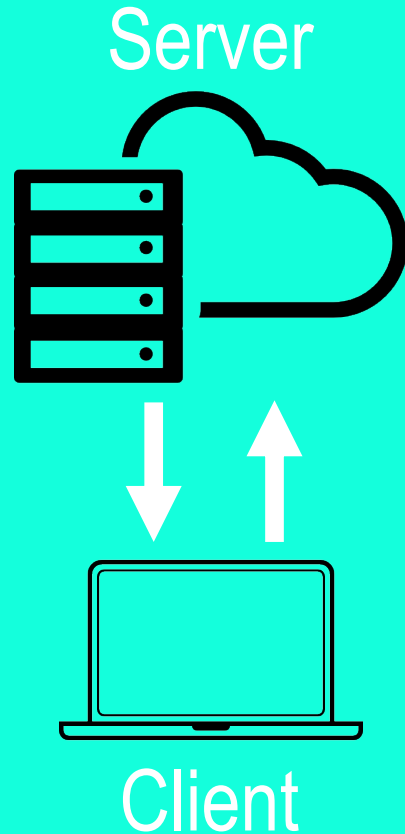
# How CSS Works



[https://developer.mozilla.org/en-US/docs/Learn/CSS/First\\_steps/How\\_CSS\\_works](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](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](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](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](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

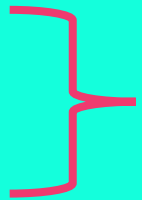
- Number
- String
- Boolean
- null
- undefined
- Object
  - Date
  - Array
  - Function

# Declare Variables

- var

- const

- let



UI5 not support right now

# Comparison

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

# Equals

<code>==</code>	equal
<code>!=</code>	not equal
<code>===</code>	strict equal
<code>!==</code>	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](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](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

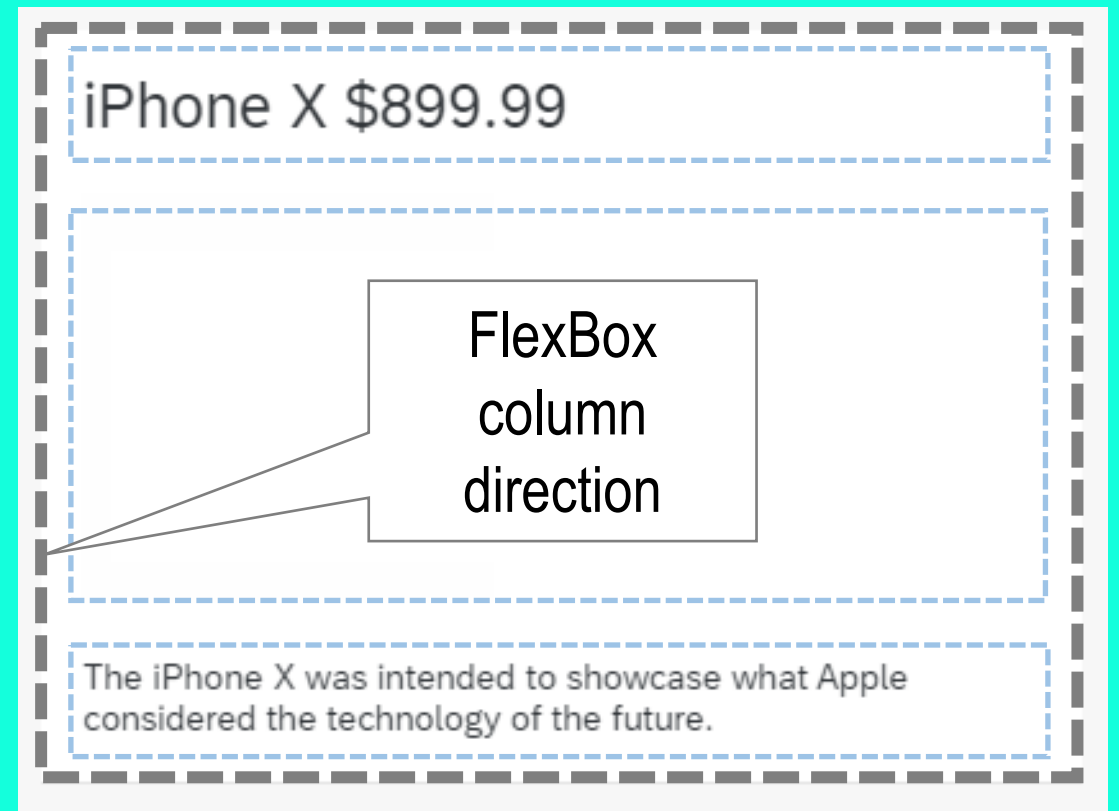
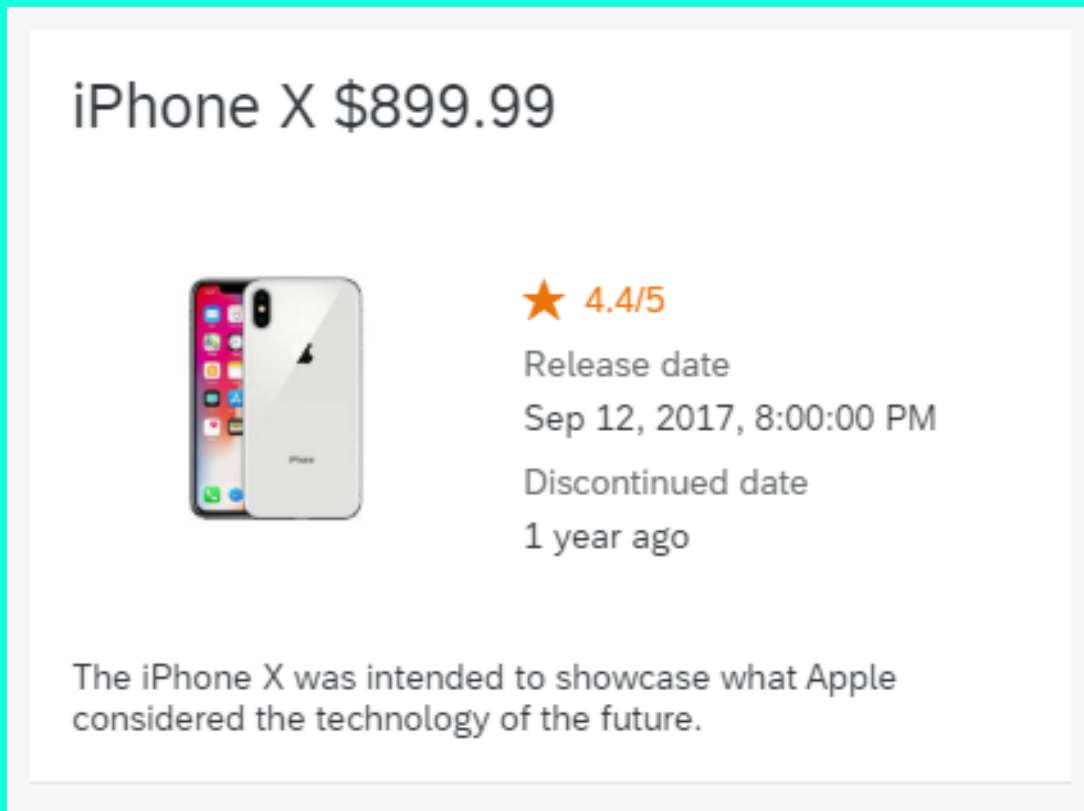
Sep 12, 2017, 8:00:00 PM

Discontinued date

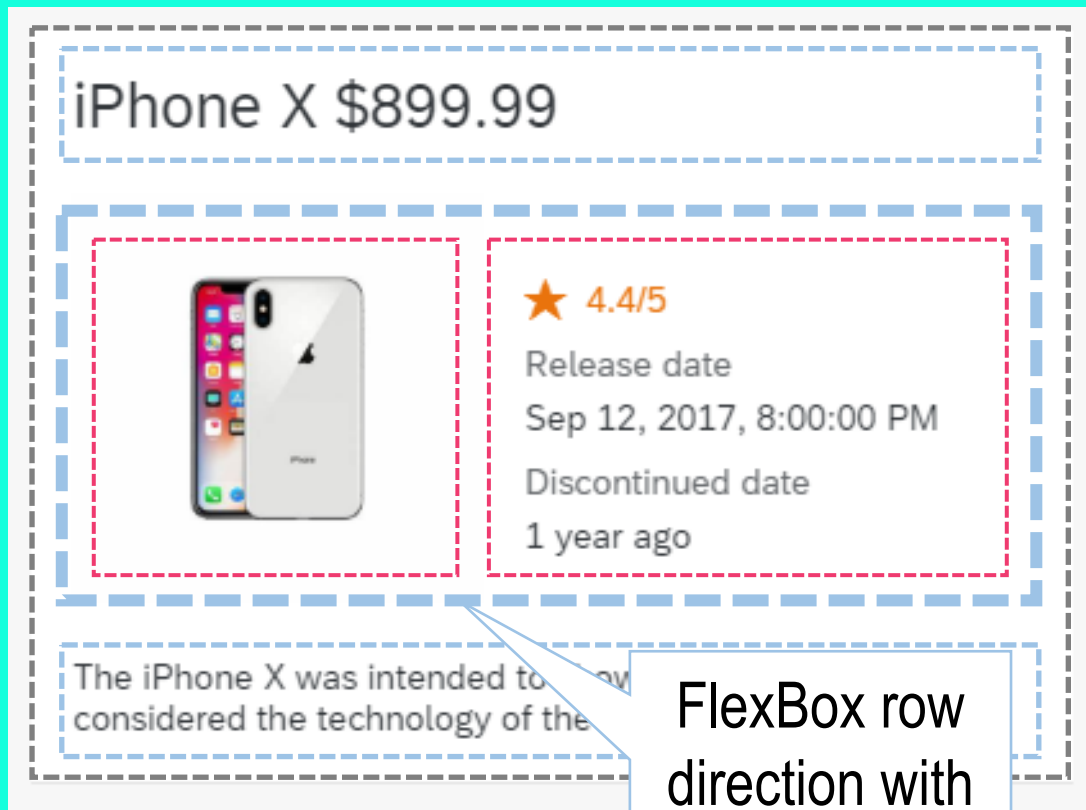
1 year ago

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



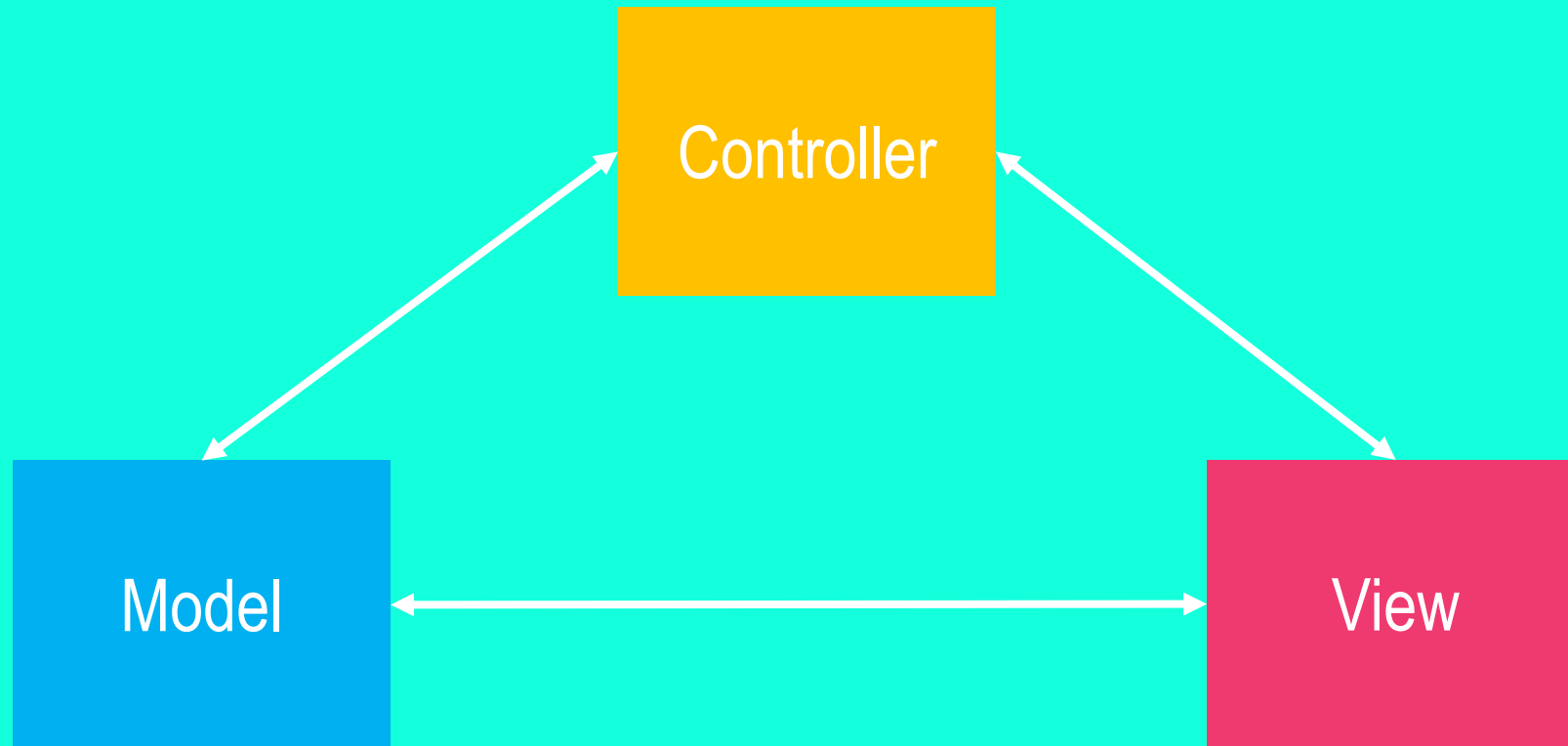
FlexBox column direction

FlexBox row direction

FlexBox column direction

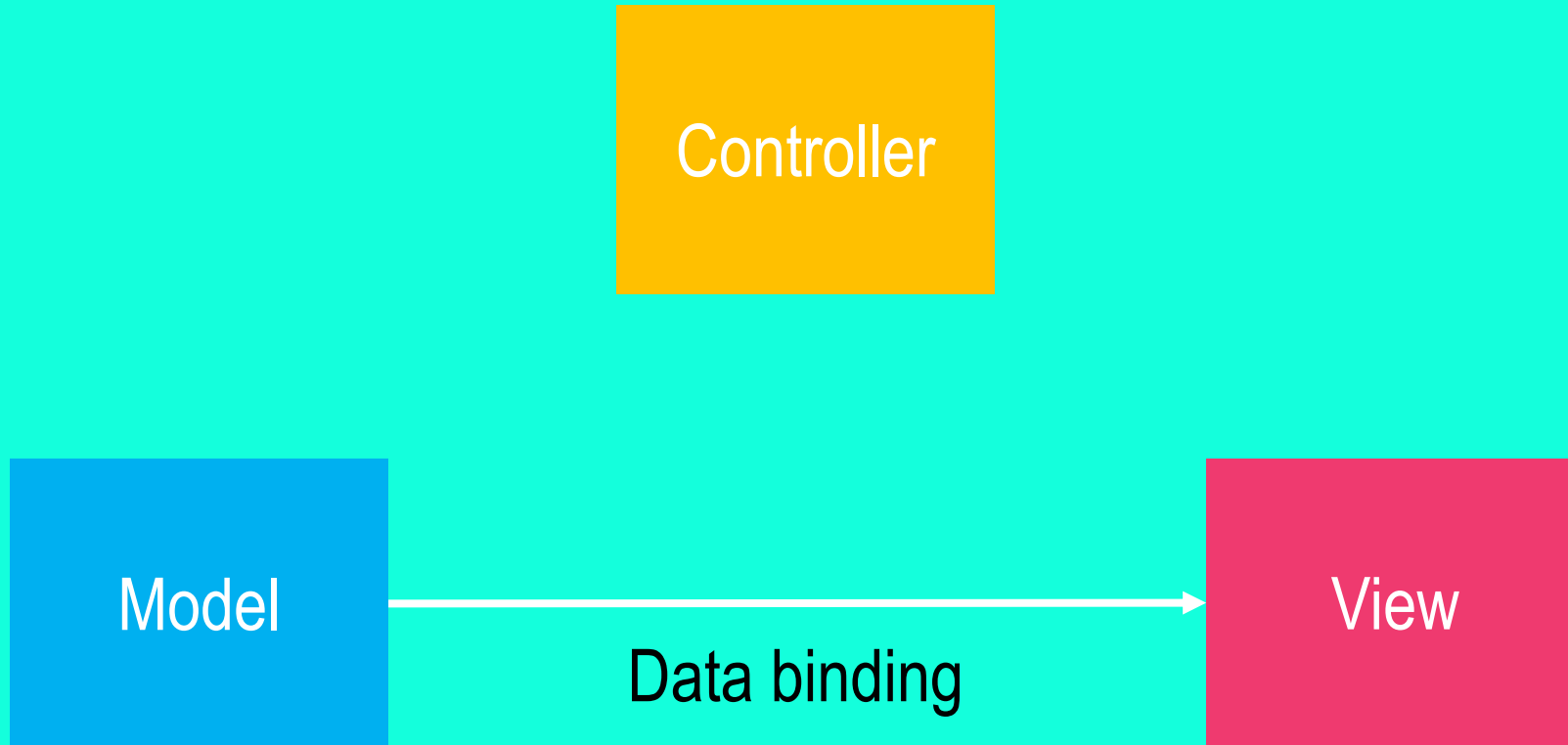


# MVC in UI5

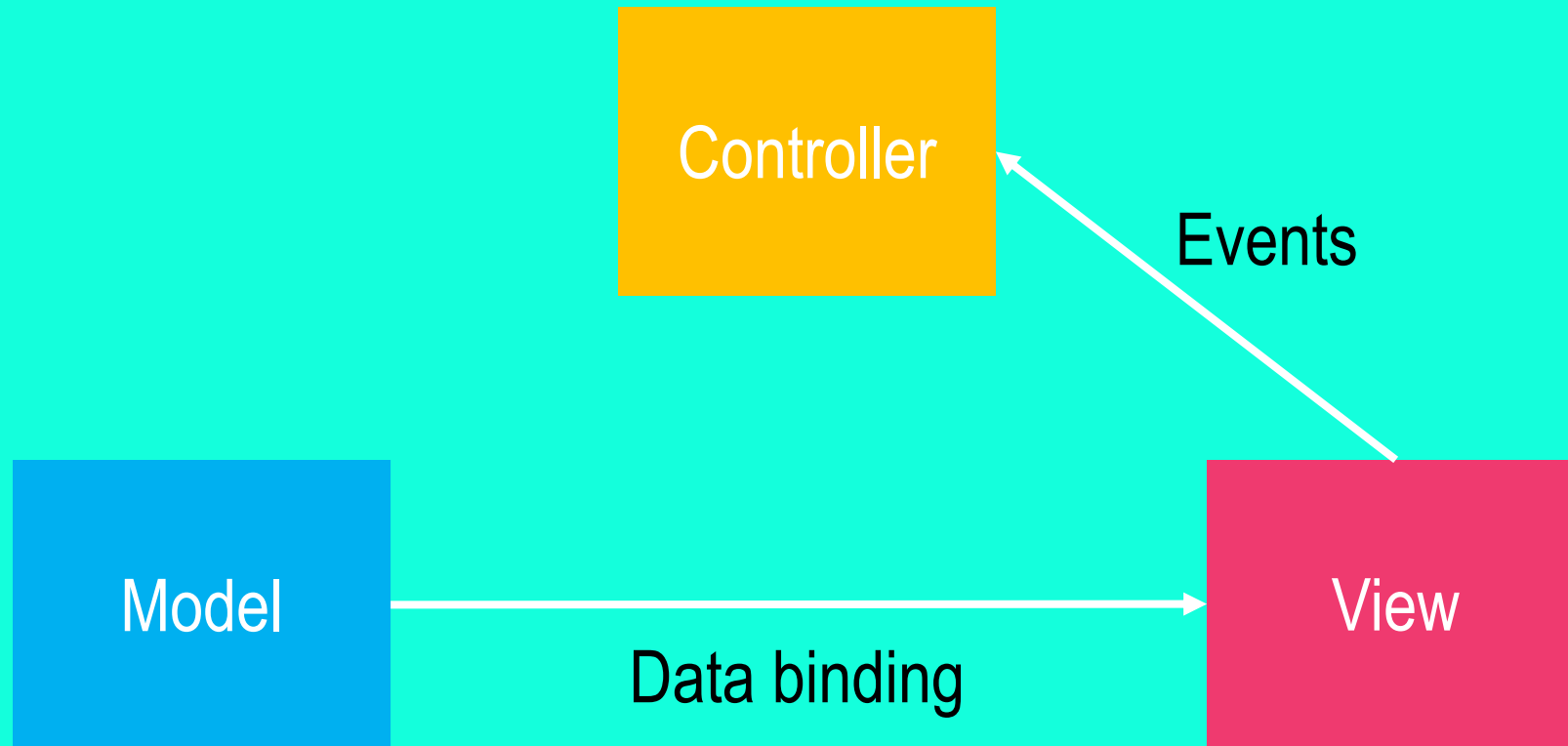




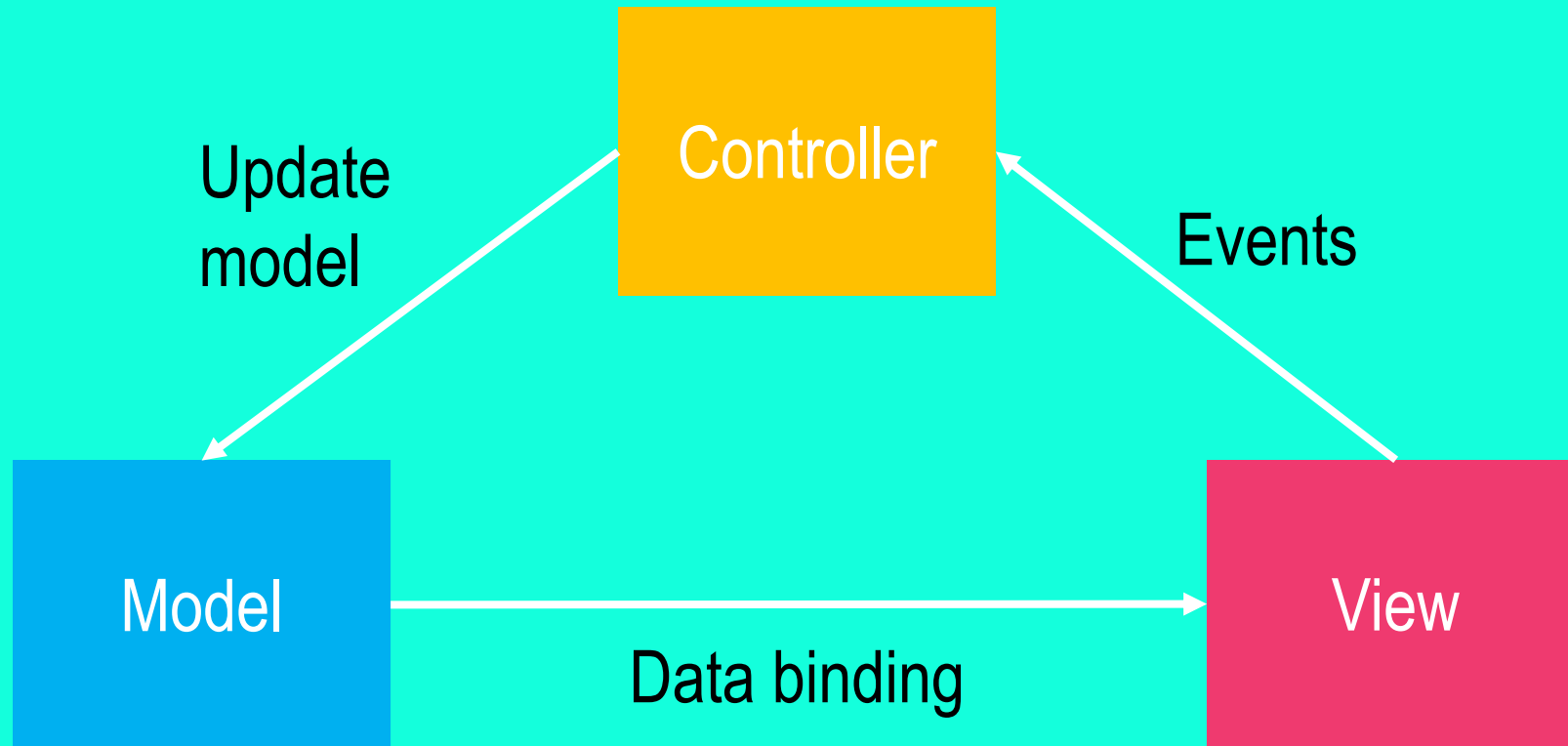
# MVC in UI5



# 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>

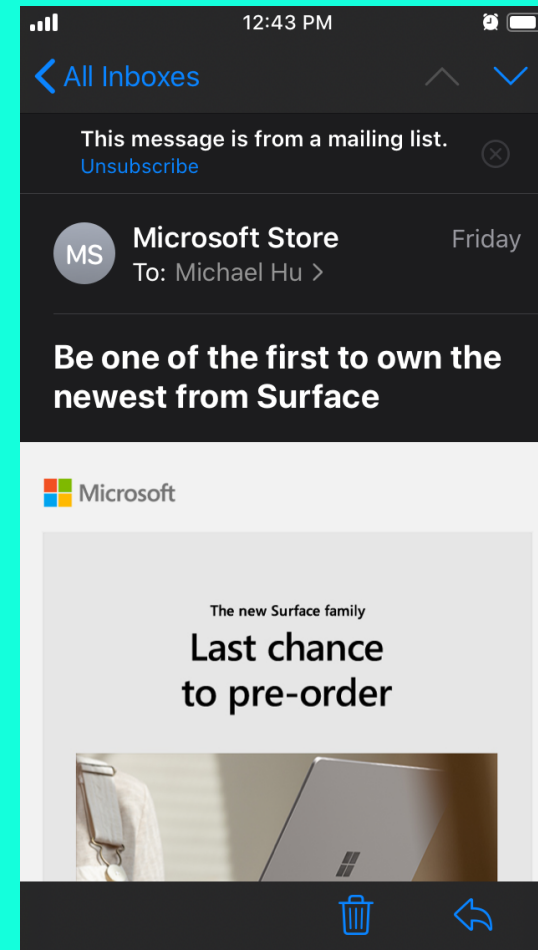
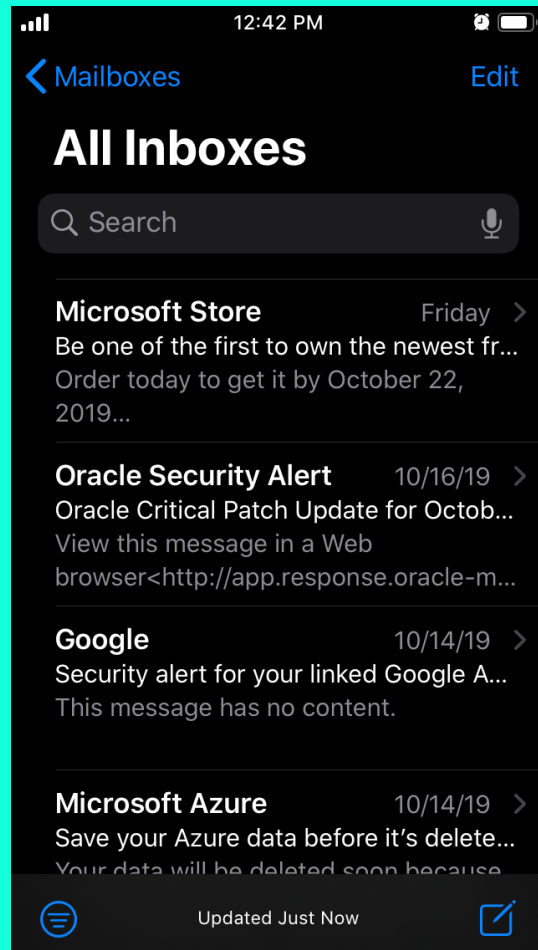
MVC

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

## **Section 4**

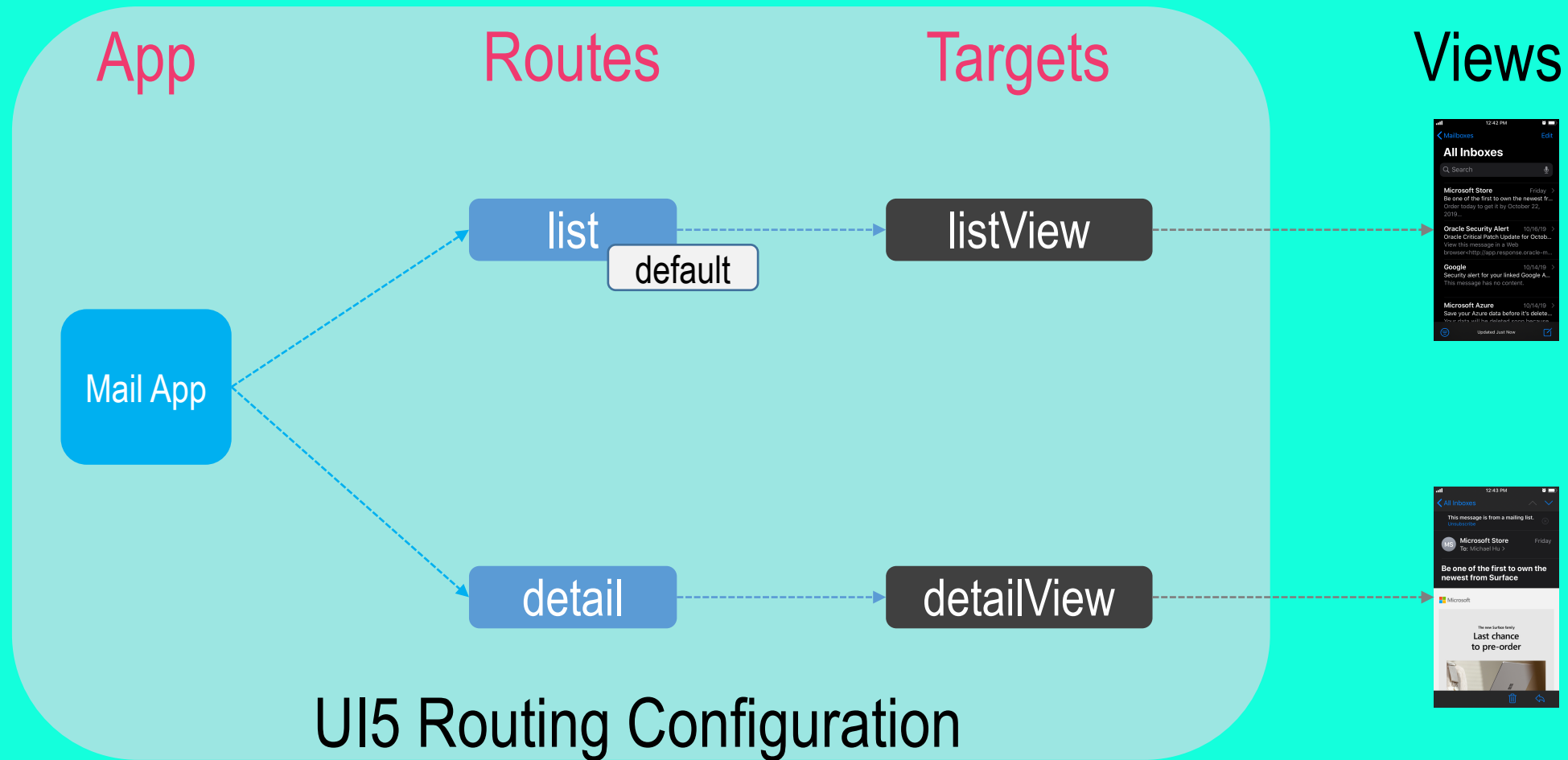
# **Develop UI5 Applications with SAP Web IDE**

# 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](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

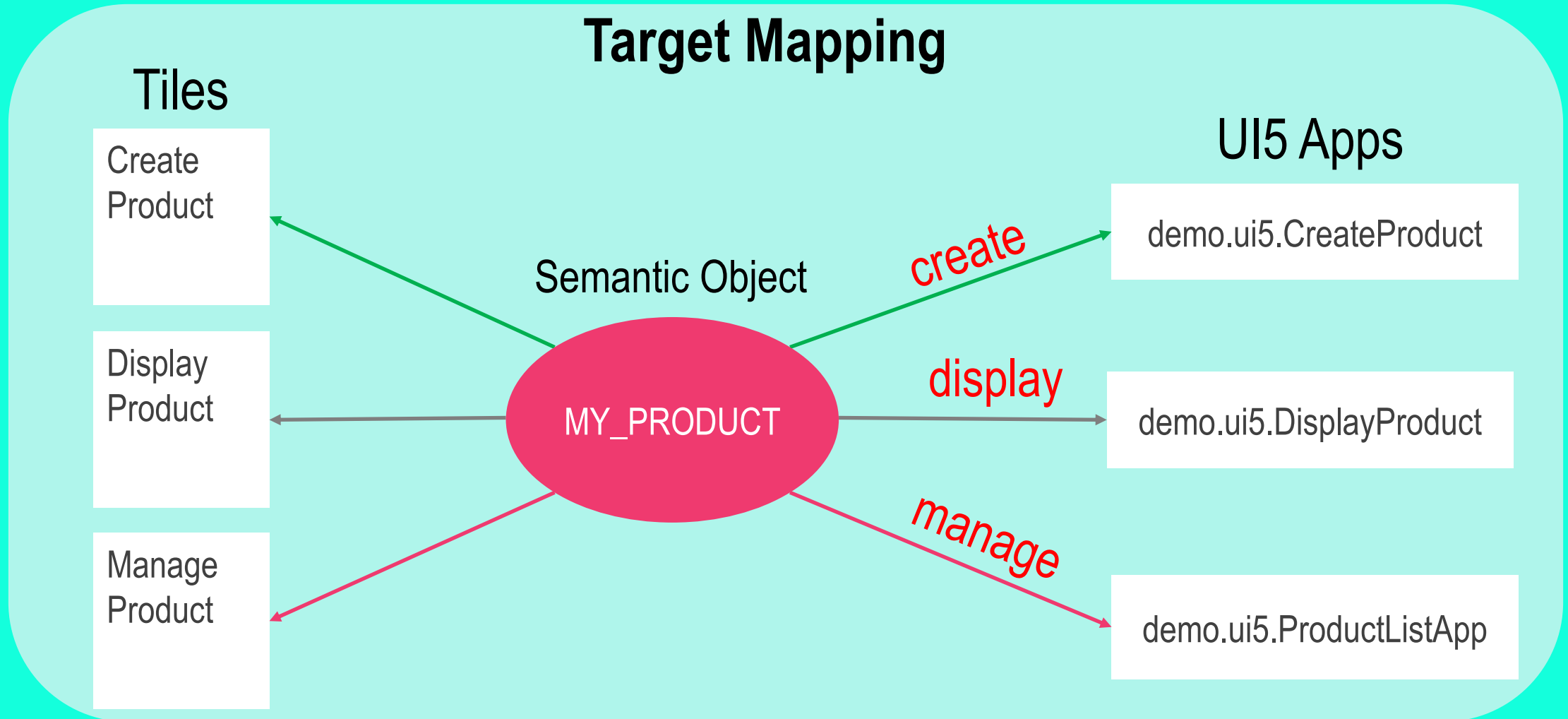
demo.ui5.DisplayProduct

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>