Dojo Toolkit

A Training course for new developer

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Course Outlines

To learn the **Dojo Toolkit** training course, you should be familiar with the following:

- JavaScript
- HTML
- CSS

Please bring your own Laptop with minimum spec.:

- CPU 2.0 GHz
- 64-bit architecture
- 4 or more CPUs/cores
- At least 8 GB of memory/RAM
- At least 4 GB of disk space
- Windows 10

Install programs to your laptop with the following:

- Visual Studio Code

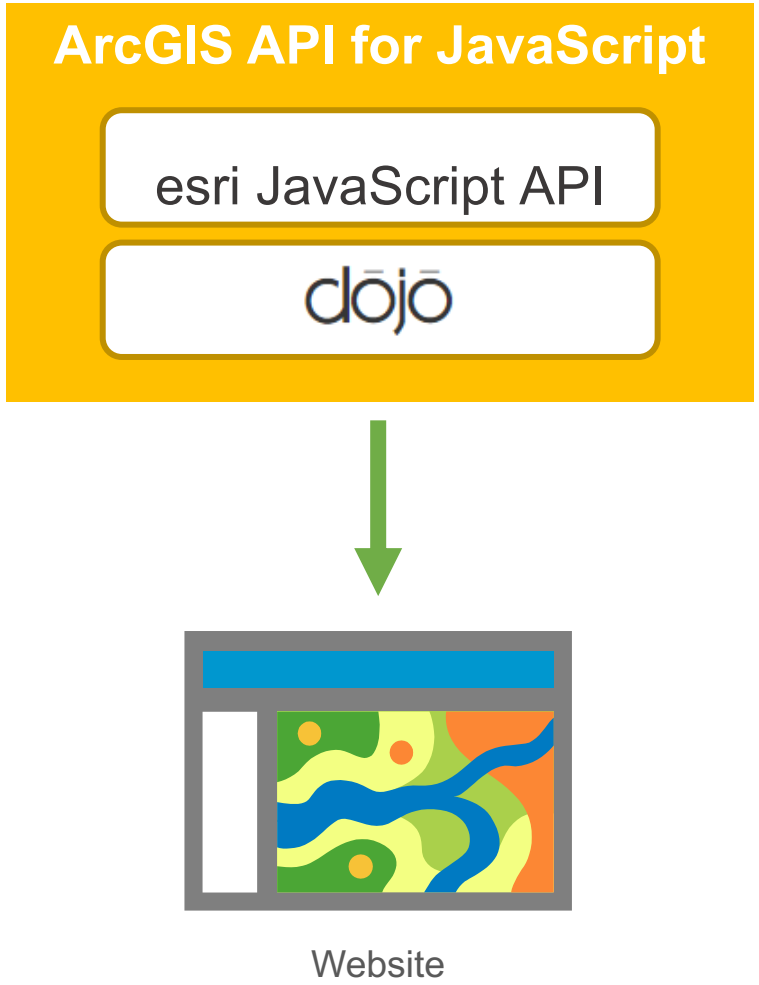
- **Dojo Toolkit (1 MD)**
  - Concept
  - Widget
  - Declarative vs Programmatic
  - Create Custom Widget
  - Use Custom Widget
  - Useful modules
  - Get Started Coding with Dojo
  - Dojo with ArcGIS API for JavaScript

Learning objective

- Implement GIS web application using ArcGIS API for JavaScript
- Get to know basic dojo concept.
- Get to know the widget concept.
- Design and create custom widget for use in web application.
- Get to know about AMOS.

Concept

ArcGIS API for JavaScript

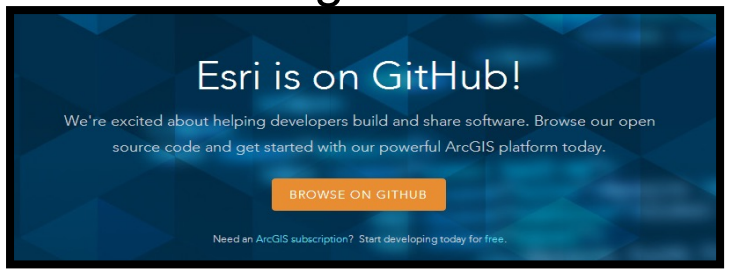


Developer resources

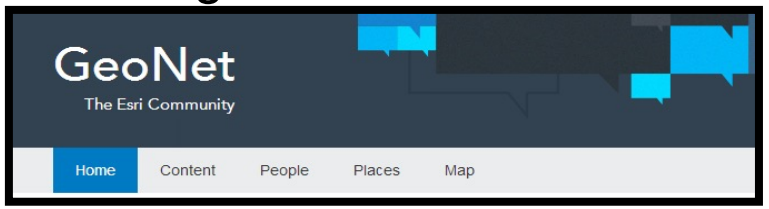
- SDK Home page
- Esri on GitHub
- GeoNet

js.arcgis.com

esri.github.io

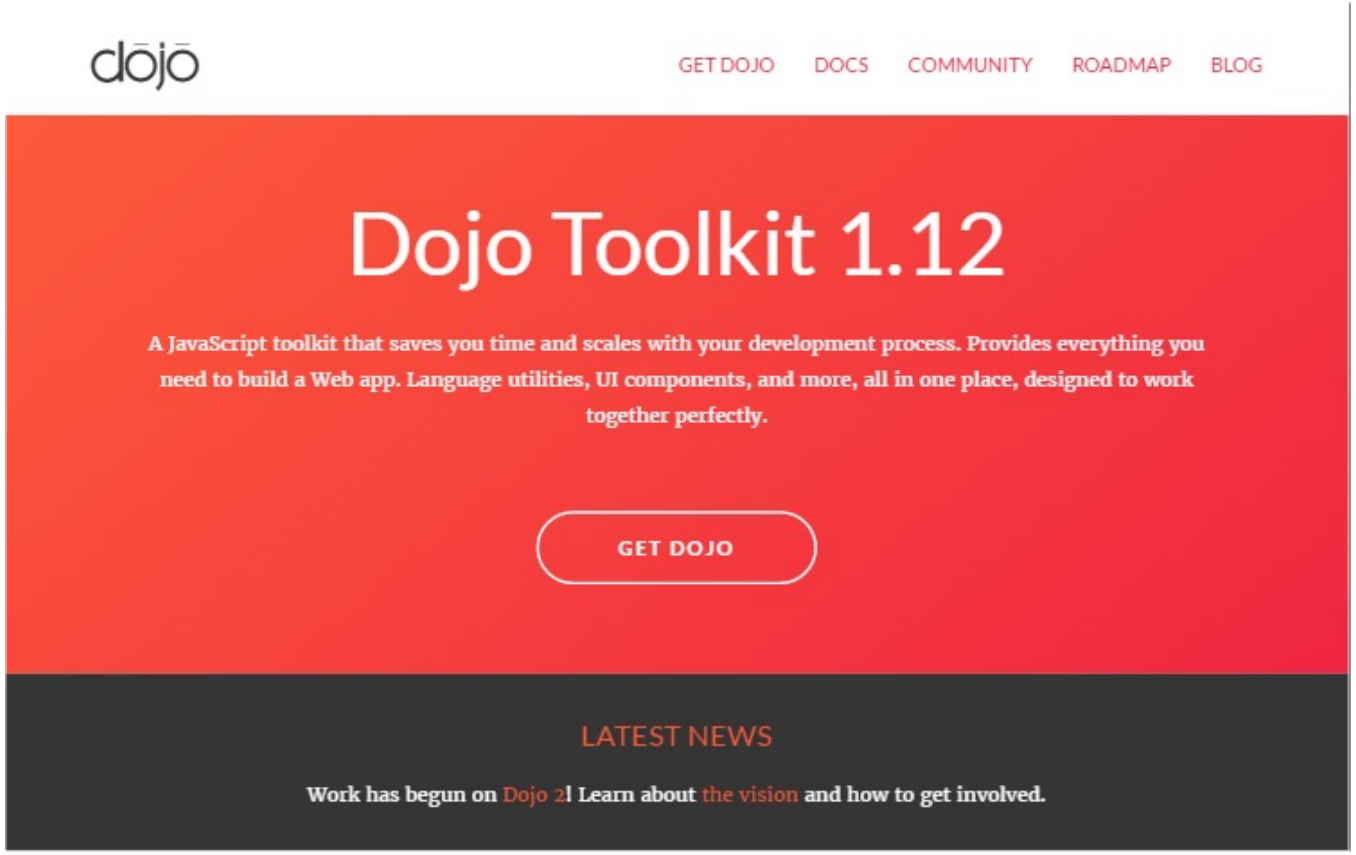


geonet.esri.com



Developer resources

- dojotoolkit.org



How to use

- Request API from server (online or local)
- Configure Dojo
- Require Widget or Class

How to use

- Request API from server (online or local)

Online (CDN)

```
<link rel="stylesheet" href="https://js.arcgis.com/3.20/esri/css/main.css">
<script src="https://js.arcgis.com/3.20/"></script>
```

Local

```
<link rel="stylesheet" href="https://<your domain>/3.20/esri/css/main.css">
<script src="https://<your domain>/3.20/"></script>
```

How to use

- Configure Dojo

```
<script>
        dojoConfig = {
                async: true,
                parseOnLoad: true
        }
</script>
```

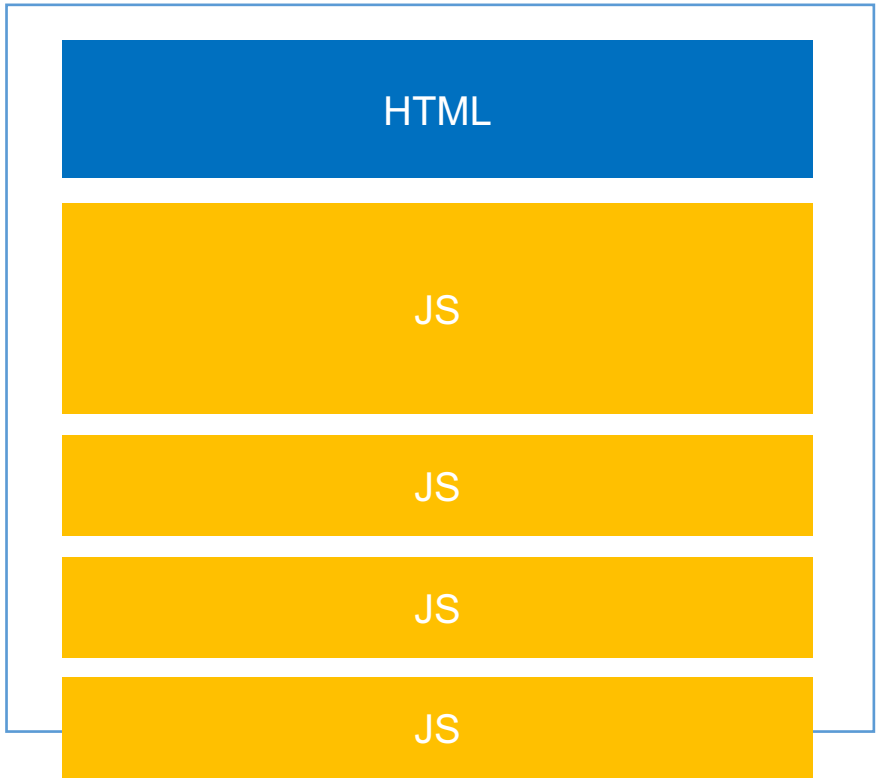
How to use

- Require Widget or Class

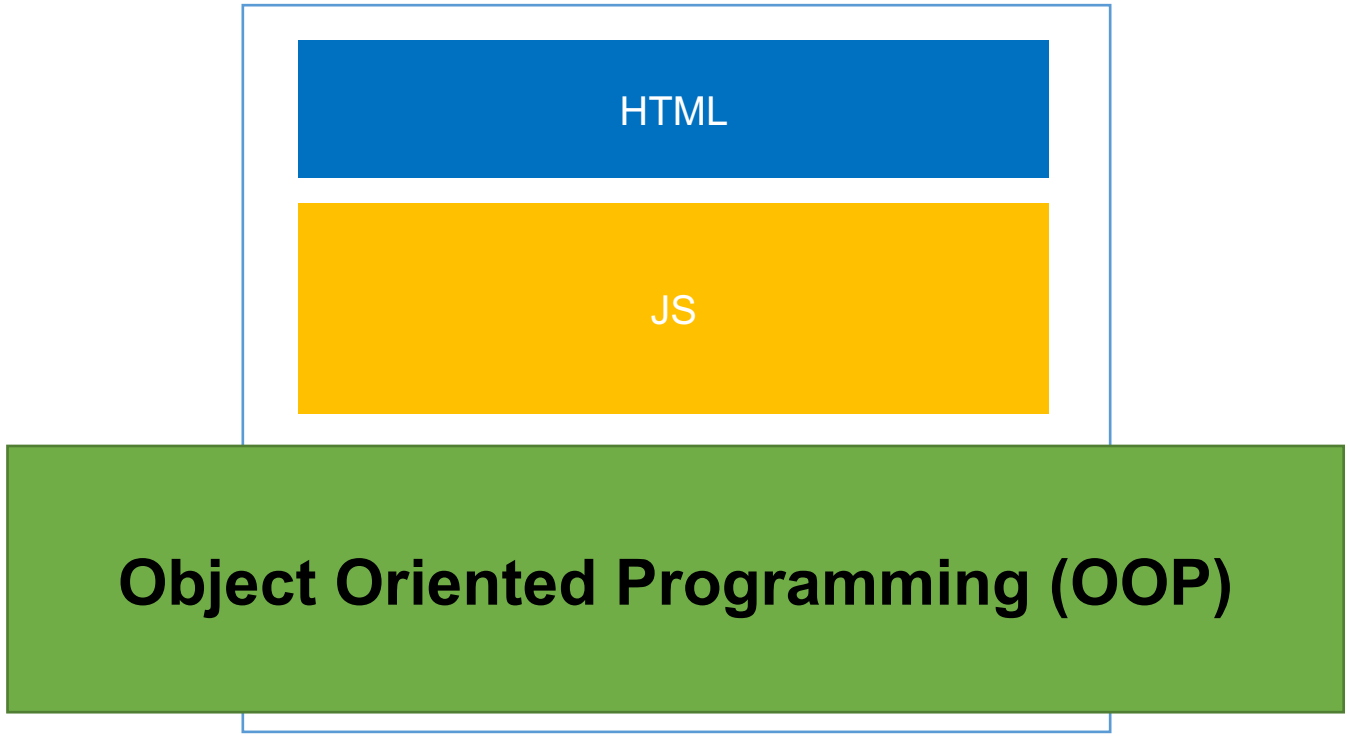
```
require(["dojo", "yourWidget"],
        function (dojo, youreWidget){
                // Put your code here.
        }
);
```


Widget

What is widget?

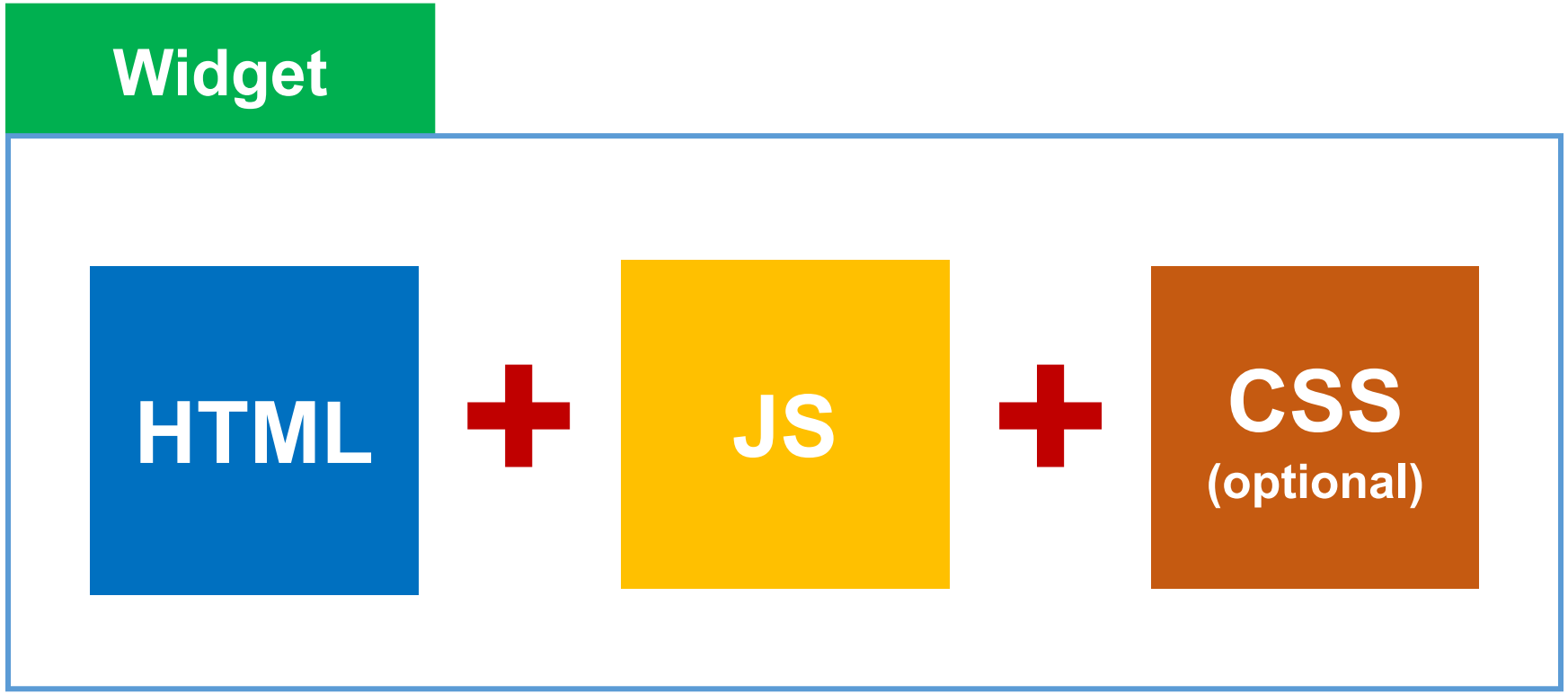


What is widget?

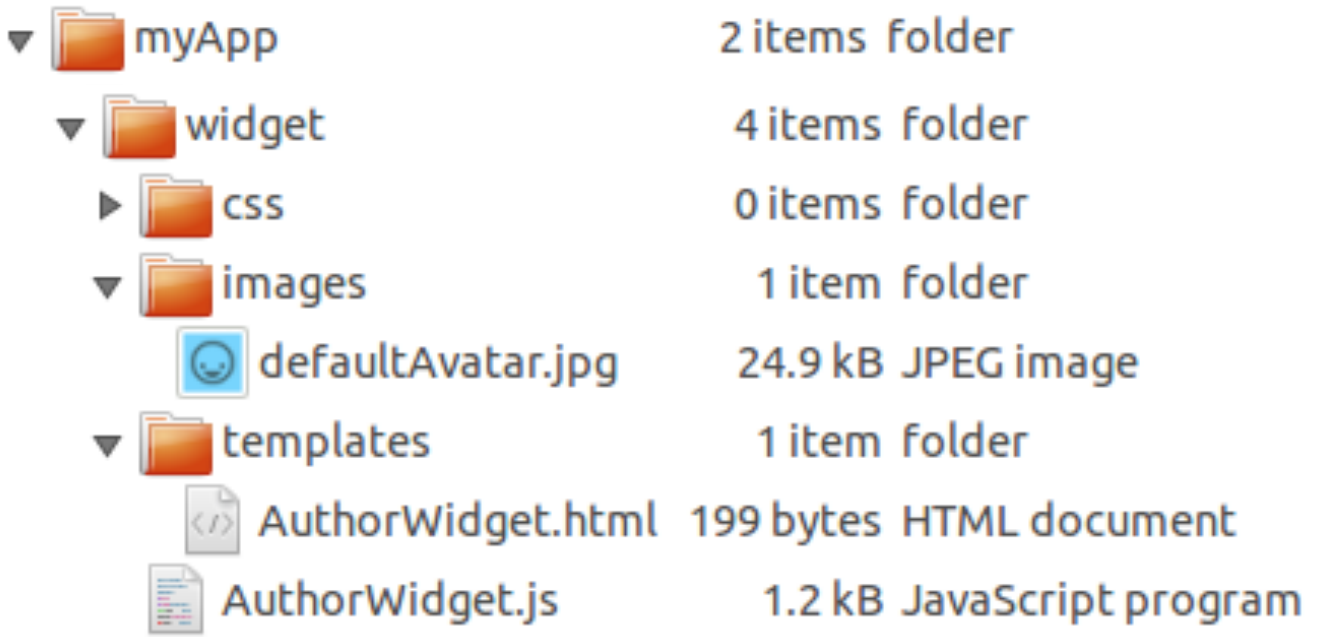


What is widget?

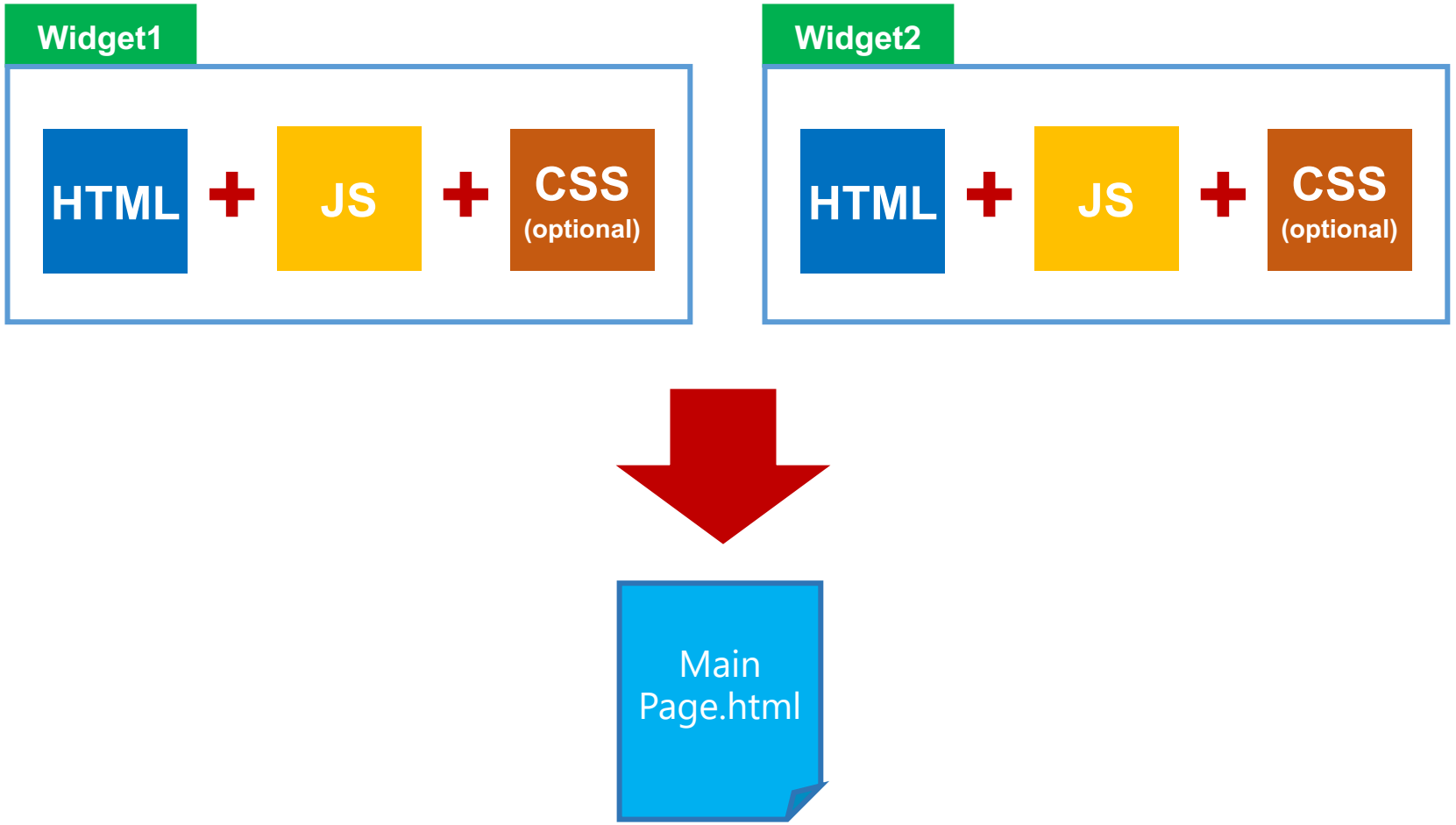
- widget is a class defined in a module that creates a UI component.



What is widget?



What is widget?



Why custom widget?

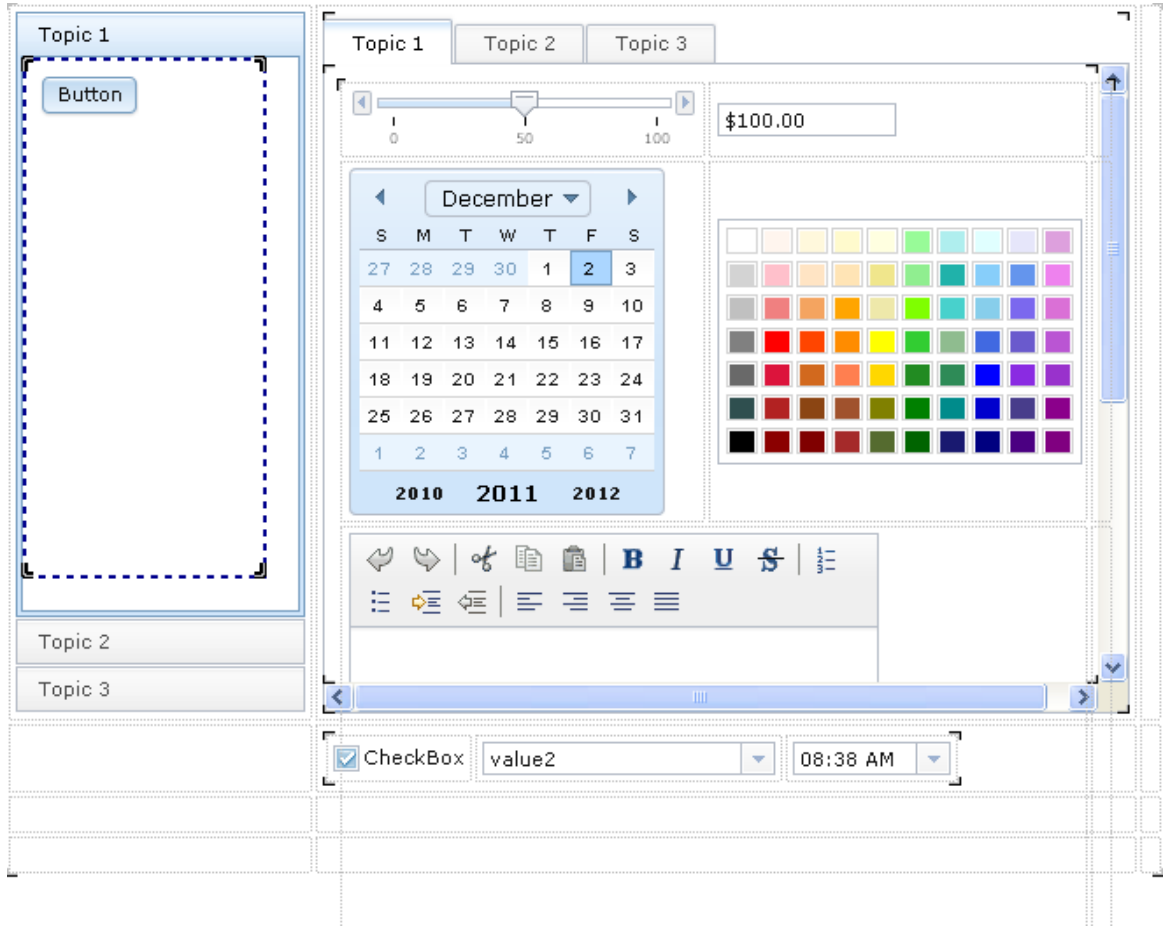
- Reusable / Sharable
- Build widgets with your custom business logic.
- Create functional forms, layouts, and much more.

gis

Dojo Toolkit main packages

- **Dojo** - Core class
- **Dijit** - Widgets, UI, Control
- **Dojox** - Addition Content

Ready to use widget of dojo (example)



- Button
- TextBox
- Slider
- ColorPicker
- Calendar
- Etc.

Declarative vs Programmatic

Declarative

```
require(["dojo/parser", "dijit/form/Button"]);
```

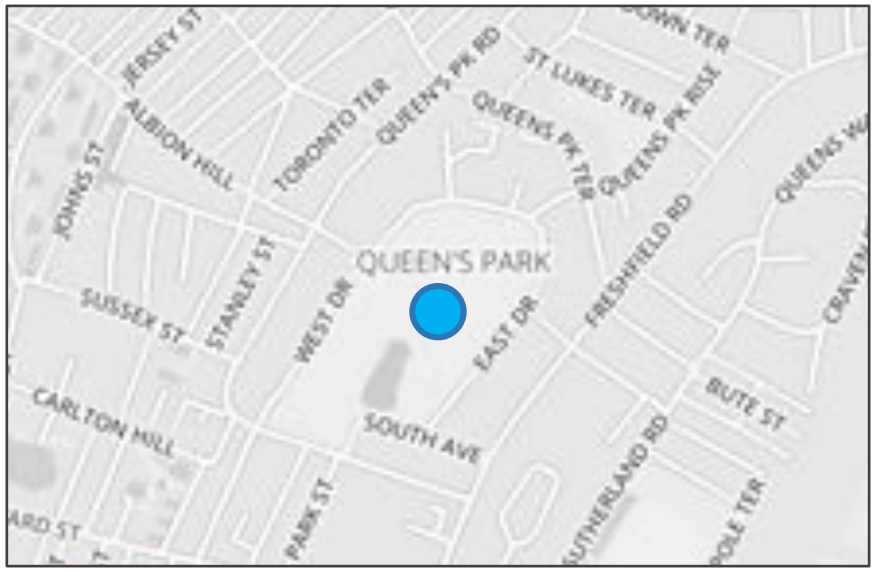
```
<button data-dojo-type="dijit/form/Button" type="button">Click me too!
    <script type="dojo/on" data-dojo-event="click" data-dojo-args="evt">
        require(["dojo/dom"], function(dom){
            dom.byId("result2").innerHTML += "Thank you! ";
        });
    </script>
</button>
<div id="result2"></div>
```

Declarative

- When we choose

X:

Y:



Programmatic

JavaScript Code

```
require(["dijit/form/Button", "dojo/dom", "dojo/domReady!"], function(Button, dom){
    // Create a button programmatically:
    var myButton = new Button({
        label: "Click me!",
        onClick: function(){
            // Do something:
            dom.byId("result1").innerHTML += "Thank you! ";
        }
    }, "progButtonNode").startup();
});
```

HTML Code

```
<button id="progButtonNode" type="button"></button>
<div id="result1"></div>
```

Programmatic

- When we choose

X1:

Y1:

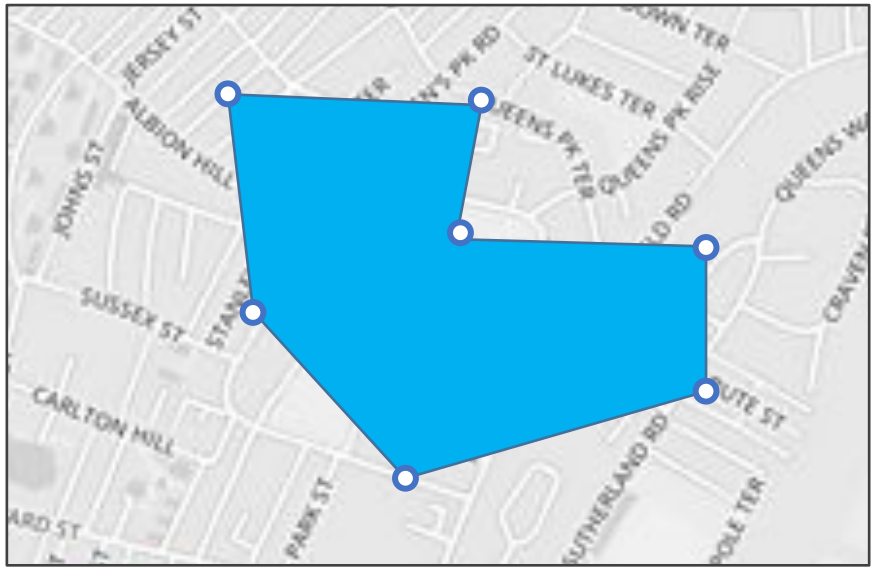
X2:

Y2:

X3:

Y3:

.
.
.



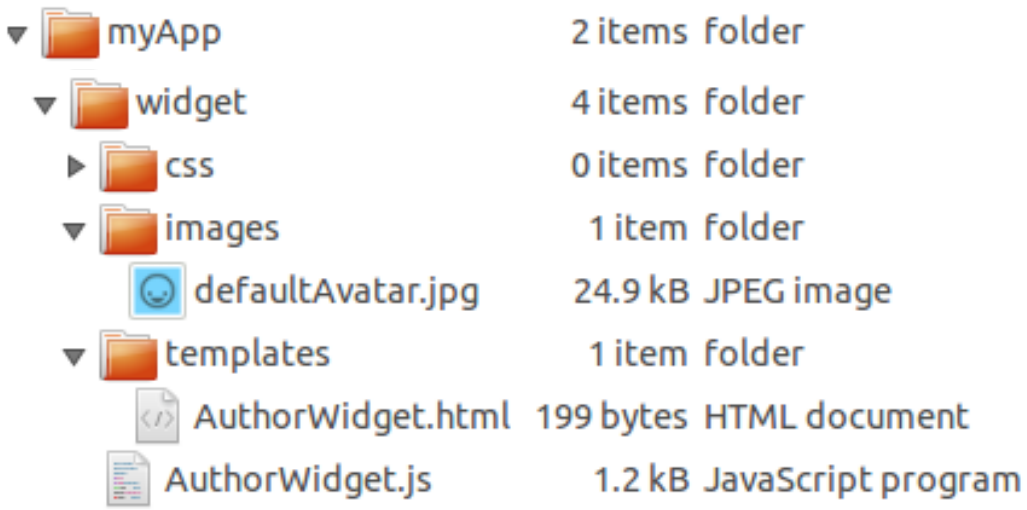
Create a widget

Step to create widget

- Create files structure for custom widget
- Define widget template (user interface)
- Write your code

Step to create widget

- Create files structure for custom widget




```
Module ID: “myApp/widget/AuthorWidget”
```

Step to create widget

- Define widget template (user interface)

HTML Code

```
<div>
    <h3 data-dojo-attach-point="nameNode">${name}</h3>
    <img class="${baseClass}Avatar" src="" data-dojo-attach-point="avatarNode
    <p data-dojo-attach-point="bioNode">${!bio}</p>
</div>
```

JavaScript Code

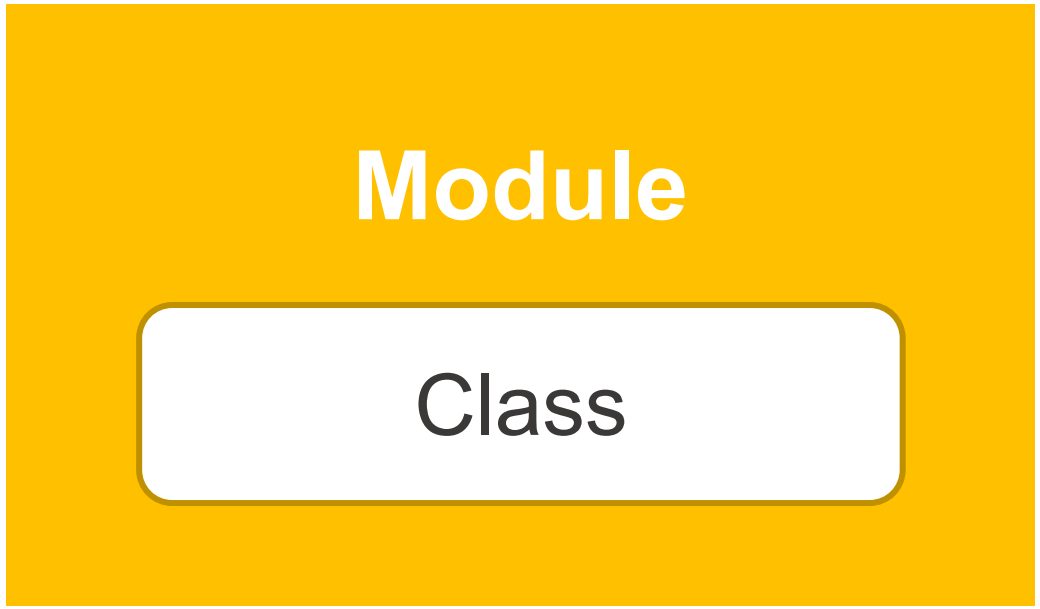
```
postCreate: function () {
        var favoriteNode = this.bioNode;
}
```

Step to create widget

- Write your code
  - Create module
  - Declare class
  - Implement functionality

Step to create widget

- Write your code



Class must live in module

Step to create widget

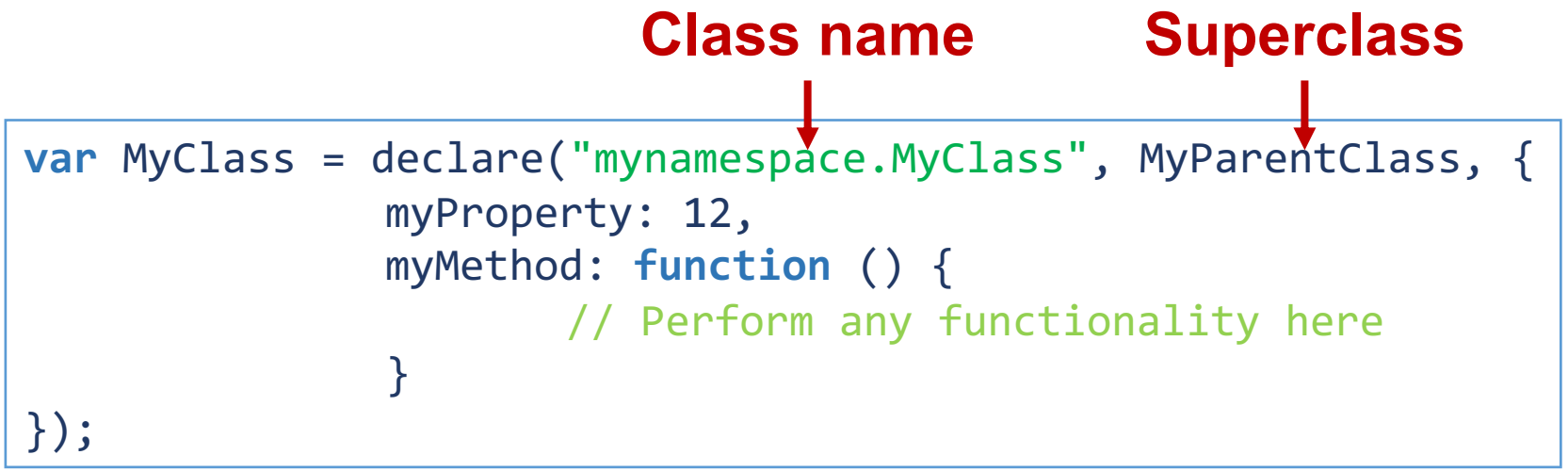
- Write your code
  - Create module

```
define([
        "dojo/_base/declare",
        "dojo/dom",
        "app/dateFormatter“
], function (declare, dom, dateFormatter) {
                return declare (null, {
                        showDate: function (id, date) {
                        // Do something
                        }
                });
})
```

Module load other module

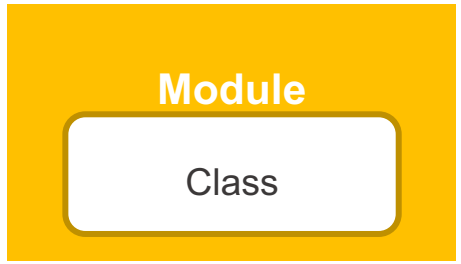
Step to create widget

- Write your code
  - Declare class



Step to create widget

- Write your code
  - Declare class




```
1  define([
2  "dojo/_base/declare",
3  "dijit/_WidgetBase",
4  "dijit/_TemplatedMixin",
5  "dijit/_WidgetsInTemplateMixin",
6  ], function (declare, _WidgetBase,
7      _TemplatedMixin, _WidgetsInTemplateMixin) {
8
9      return declare([
10         _WidgetBase,
11         _TemplatedMixin,
12         _WidgetsInTemplateMixin], {
13
14         constructor: function (param) {
15         },
16
17         postCreate: function () {
18             this.inherited(arguments);
19         },
20
21         startup: function () {
22             this.inherited(arguments);
23         }
24     });
25
26 });
```

Class

Module

Step to create widget

- Write your code
  - Declare class

```
define([
 "dojo/_base/declare",
 "dijit/_WidgetBase",
 "dijit/_TemplatedMixin",
 "dijit/_WidgetsInTemplateMixin",
 ], function (declare, _WidgetBase,
     _TemplatedMixin, _WidgetsInTemplateMixin) {
```

Widget lifecycle (minimum req's)

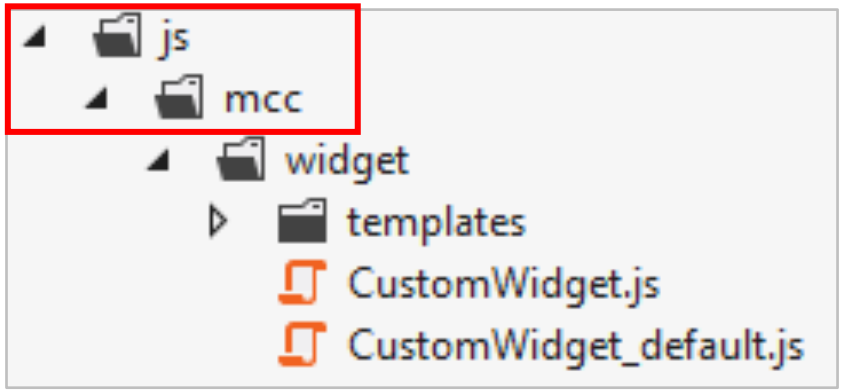
```
var wgDeclare = declare([], {

    /* Start: Basic Properties */
    widgetsInTemplate: true,
    templateString: template,
    baseClass: "myTemplate",
    /* End: Basic Properties */

    constructor: function () {

    },
    postCreate: function () {
        this.inherited(arguments);
    },
    startup: function () {
        this.inherited(arguments);

    }
});
return wgDeclare;
```


Use widget in your application

Step to use your widget

- Configure Dojo
- Require and instant widget

Configure Dojo

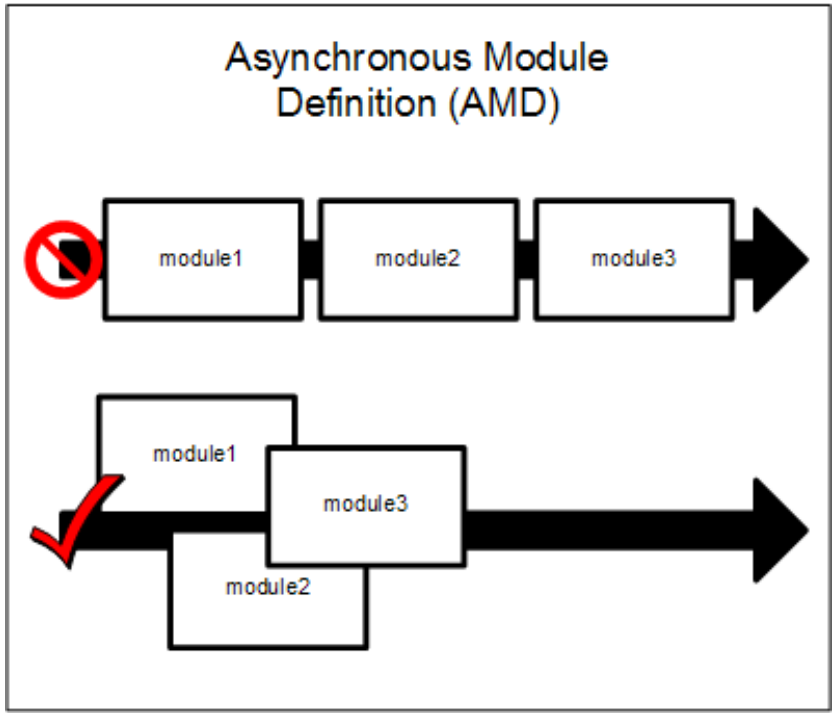



```
dojoConfig = {
    parseOnLoad: true,
    isDebug: false,
    packages: [{
        name: 'mcc',
        location: baseLocation + '/js/mcc'
    }],
    async: true,
};
```

"mcc/widget/CustomWidget"

Configure Dojo

```
dojoConfig = {
    parseOnLoad: true,
    isDebug: false,
    packages: [{
        name: 'mcc',
        location: baseLocation + '/js/mcc'
    }],
    async: true,
};
```



Require and instant widget

```
<script type="text/javascript">

    require(["dojo/ready", "mcc/widget/CustomWidget_default"],
        function (ready, CustomWidget_default) {
            ready(function () {
                var customWidget = new CustomWidget_default({}, "myWi
                customWidget.startup();
            });
        });

</script>
```

Useful modules

“dojo/on”

- Use for event handler

```
postCreate: function () {
        this.inherited(arguments);
        on(map, "click", lang.hitch(this, "onMapClick"));
},

onMapClick: function (evt) {
        // Do something.
}
```

"dojo/_base/lang"

- **lang.hitch()** Use to provide proper context for various methods

```
postCreate: function () {
        this.inherited(arguments);
        on(map, "click", lang.hitch(this, "onMapClick"));
},

onMapClick: function (evt) {
        // Do something.
}
```

“dojo/Evented”

- Inherit from “**dojo/Evente** widget emit events to other widgets.

```
onSpatialSuccess: function (response) {
        this.emit("spatial-success", response.records);
}
```


Get Started

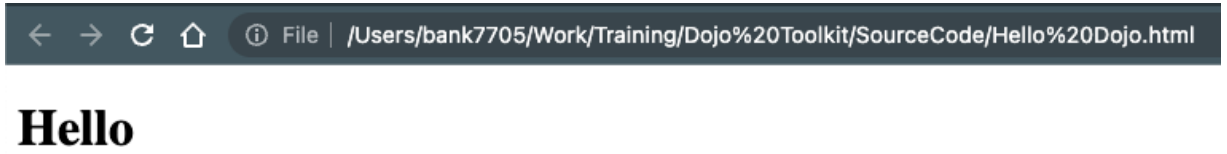
Hello Dojo

Getting started with Dojo is as simple as including the dojo.js script in a web page, just like any other JavaScript file. Dojo is available on popular CDNs, so to get started enter the following in a file named hellodojo.html and open it in your web browser.

```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8">
<title>Tutorial: Hello Dojo!</title>
</head>
<body>
<h1 id="greeting">Hello</h1>
<!-- load Dojo -->
<script src="//ajax.googleapis.com/ajax/libs/dojo/1.10.4/dojo/dojo.js"
data-dojo-config="async: true"></script>
</body>
</html>
```

Hello Dojo

Result



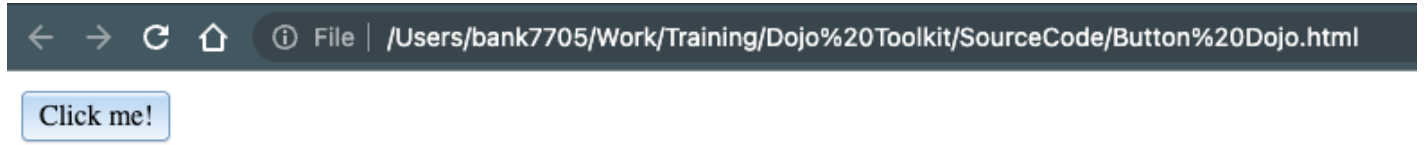
Your first dojo button

```
<body class="claro">
<script>
   require(["dojo/ready", "dijit/form/Button", "dojo/dom"], function (ready, Button, dom) {
      ready(function () {
          // Create a button programmatically:
          var myButton = new Button({
              label: "Click me!",
              onClick: function () {
                    // Do something:
                     dom.byId("result1").innerHTML += "Thank you! ";
              }
          }, "progButtonNode");
      });
   });
</script>

<button id="progButtonNode" type="button"></button>
<div id="result1"></div>
</body>
```

Your first dojo button

Result

Button with claro style




Dojo with ArcGIS API for JS

Dojo + ArcGIS API for JavaScript

```
<meta name="viewport" content="initial-scale=1, maximum-scale=1,user-scalable=no" />
<title>Simple Map</title>
<link rel="stylesheet" href="https://js.arcgis.com/3.41/esri/css/esri.css">
<link rel="stylesheet" href="https://js.arcgis.com/3.41/dijit/themes/claro/claro.css" media="screen">
<style>
   html,
   body,
   #map {
    height: 100%;
    margin: 0;
    padding: 0;
   }
</style>
<script src="https://js.arcgis.com/3.41/"></script>
```

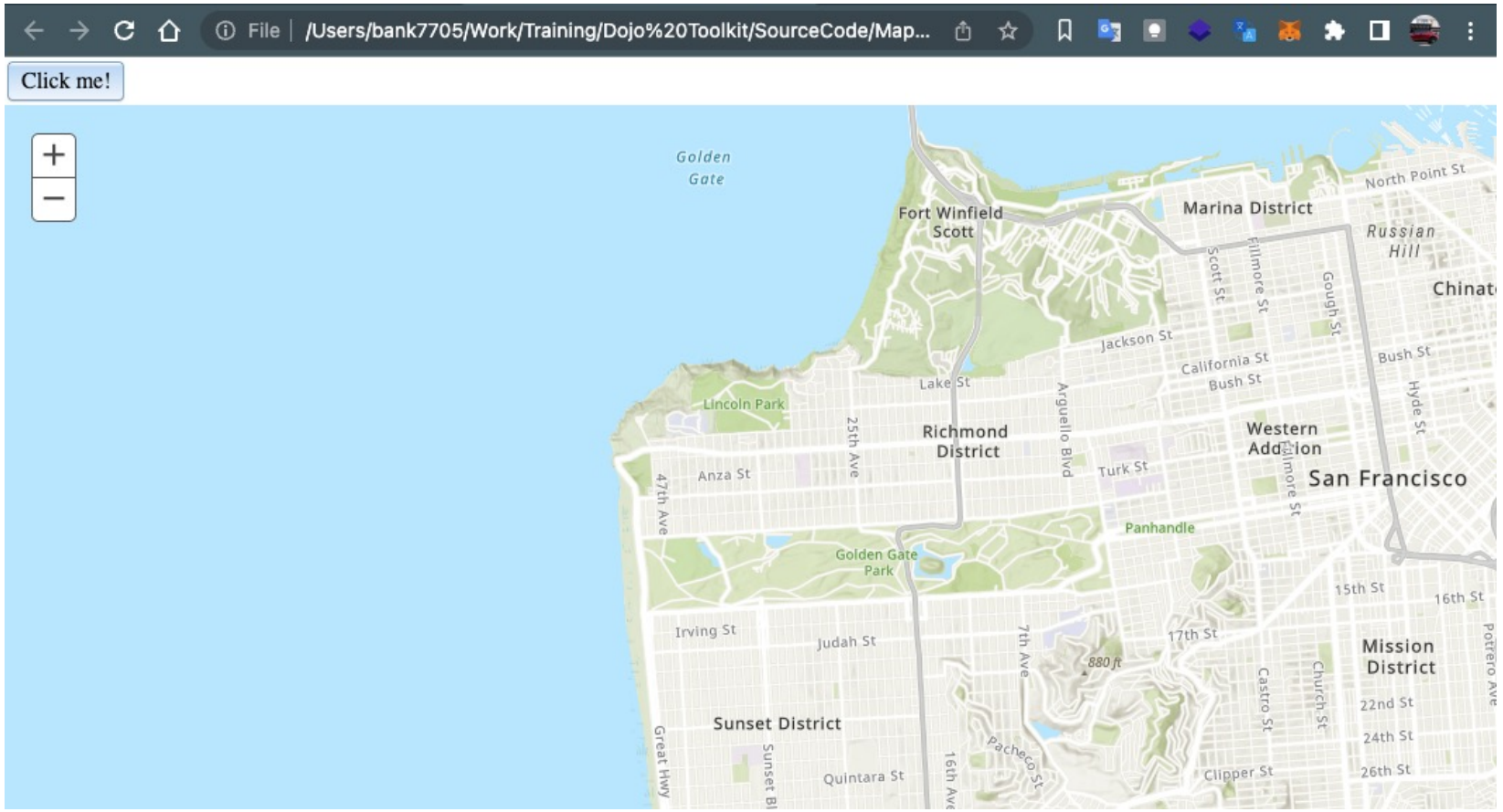
Dojo with ArcGIS API for JS

```
<script>
var map;

 require(["esri/map", "dijit/form/Button", "dojo/domReady!"], function (Map, Button) {
  map = new Map("map", {
   basemap: "topo-vector", //For full list of pre-defined basemaps, navigate to http://arcg.is/1JVo6Wd
   center: [-122.45, 37.75], // longitude, latitude
   zoom: 13
  });

  var myButton = new Button({
   label: "Click me!",
   onClick: function () {
   // Do something:
    dom.byId("result1").innerHTML += "Thank you! ";
   }
  }, "progButtonNode");
 });
</script>
```

```
<body class="claro">
   <button id="progButtonNode" type="button"></button>
   <div id="result1"></div>
   <div id="map"></div>
</body>
```

Dojo + ArcGIS API for JavaScript

Result




END