Develop SAP Business One extensions on the SAP Cloud Platform

SAP Run Simple

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The objective of this hands on is to put in practice how to develop SAP Business One extensions on SAP Cloud Platform.

The exercise will be composed by

- Step 1: Create a Build prototype connecting to B1
- Step 2: Import the Build prototype into a SCP WebIDE Fiori application and connect to your real B1 backend
- Step 3: Clone an existing NodeJS application
- Step 4: Deploy the server side NodeJS application to the Cloud Foundry environment
- Step 5: Modify the SAP Fiori app to consume the server side NodeJS application
- Step 6: Add a new service to the NodeJS application and consume it from SAP Fiori
- Step 7: Call the new NodeJS service from the SAP Fiori app

This hands-on exercise will require several steps, please follow them in the proposed order as each step is counting on the precedent steps.

PREREQUISITES

i. Download and Install Development Tools

Download and install git version control on your system from the following link

https://git-scm.com/downloads

We will also make use of the Cloud Foundry Environment.

To do so, we need the Cloud Foundry command line interface (CLI)

You can download it and install if the CF CLI for your operating system on.

https://github.com/cloudfoundry/cli#downloads

Downloads

Installing using a package manager

Mac OS X and **Linux** using Homebrew via the cloudfoundry tap:

```
brew install cloudfoundry/tap/cf-cli
```

Debian and **Ubuntu** based Linux distributions:

```
# ...first add the Cloud Foundry Foundation public key and package repository to your system
wget -q -O - https://packages.cloudfoundry.org/debian/cli.cloudfoundry.org.key | sudo apt-key add -
echo "deb https://packages.cloudfoundry.org/debian stable main" | sudo tee /etc/apt/sources.list.d/cloudfou
# ...then, update your local package index, then finally install the cf CLI
sudo apt-get update
sudo apt-get install cf-cli
```

Enterprise Linux and **Fedora** systems (RHEL6/CentOS6 and up):

```
# ...first configure the Cloud Foundry Foundation package repository
sudo wget -O /etc/yum.repos.d/cloudfoundry-cli.repo https://packages.cloudfoundry.org/fedora/cloudfoundry-c
# ...then, install the cf CLI (which will also download and add the public key to your system)
sudo yum install cf-cli
```

Installers and compressed binaries

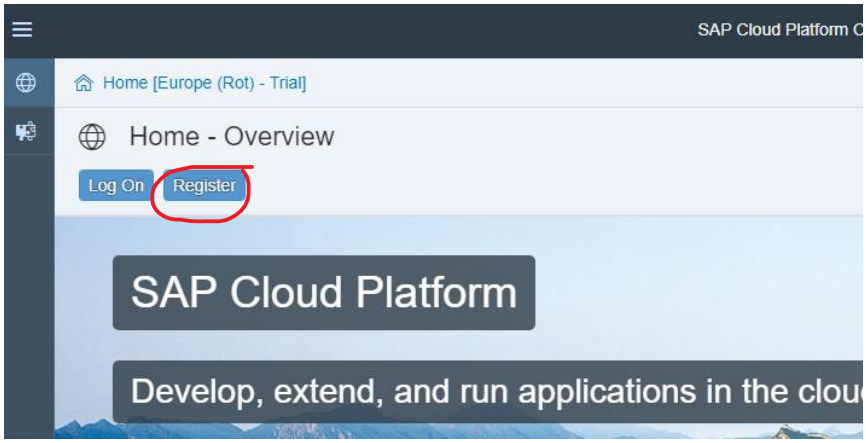
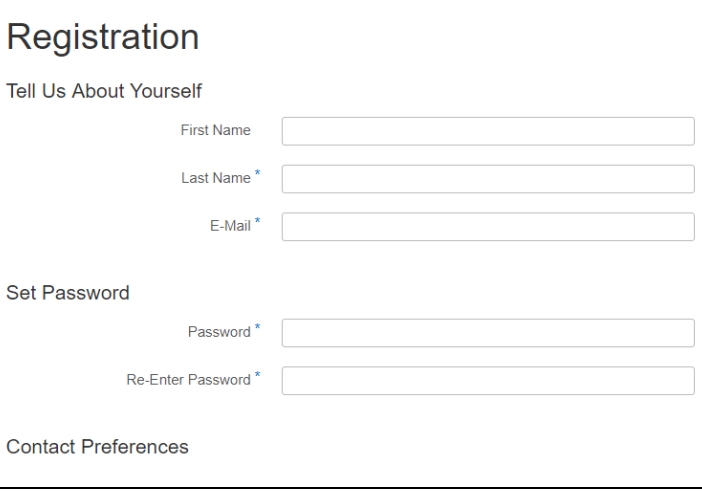
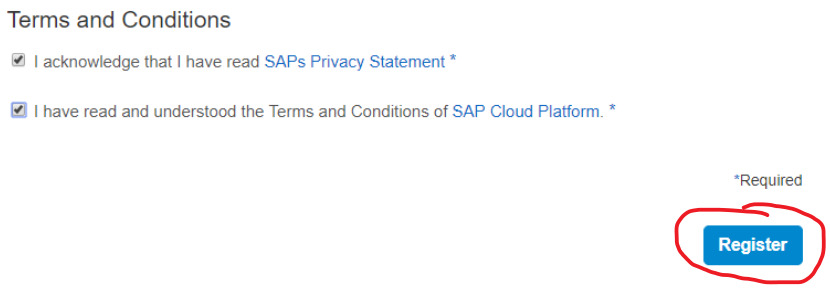
	Mac OS X 64 bit	Windows 64 bit	Linux 64 bit
Installers	pkg	zip	rpm / deb
Binaries	tgz	zip	tgz

ii. Create a SAP Cloud platform Neo trial account

The exercises proposed in this hands on are implemented on top of the SAP Cloud Platform.

If you have already a trial SAP Cloud Platform account, you can skip this step.

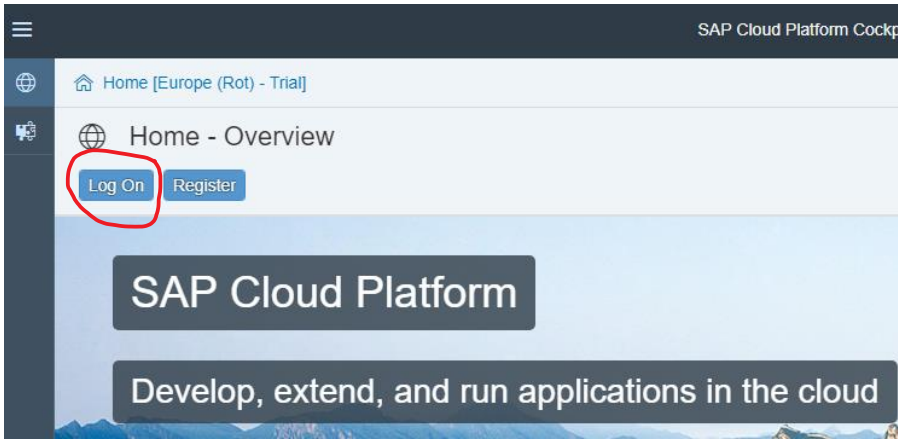
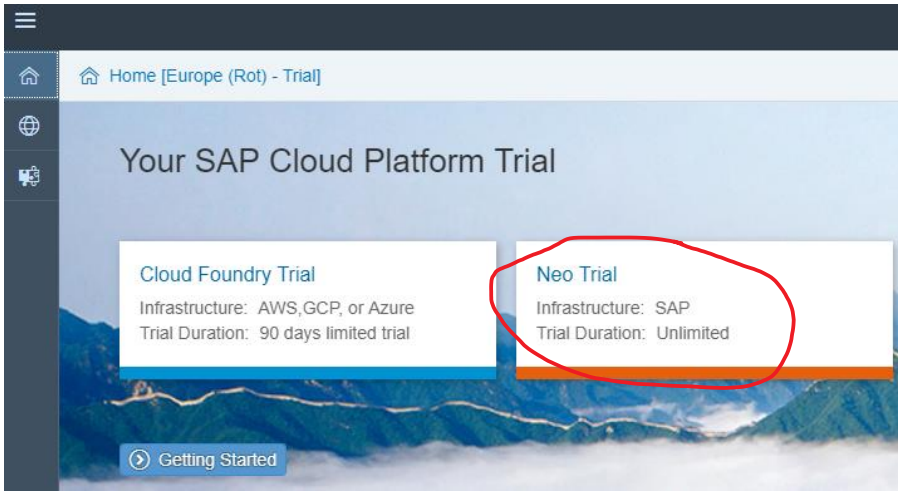
To create a trial SAP Cloud Platform account, go to the following link:

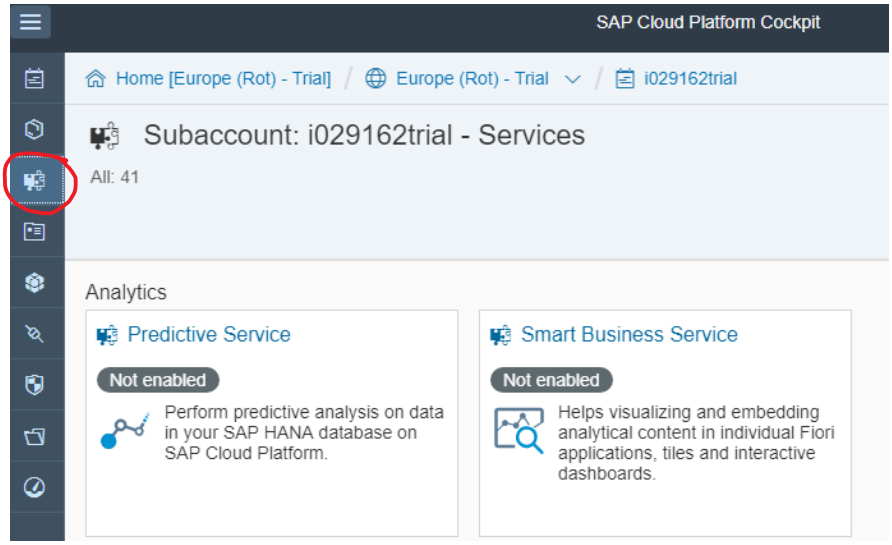
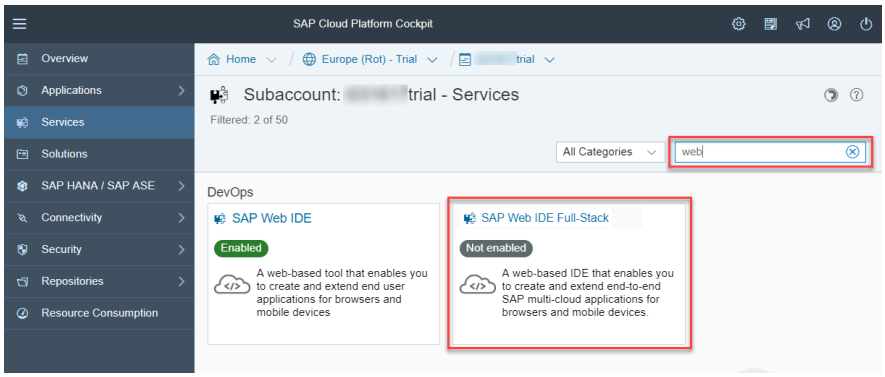
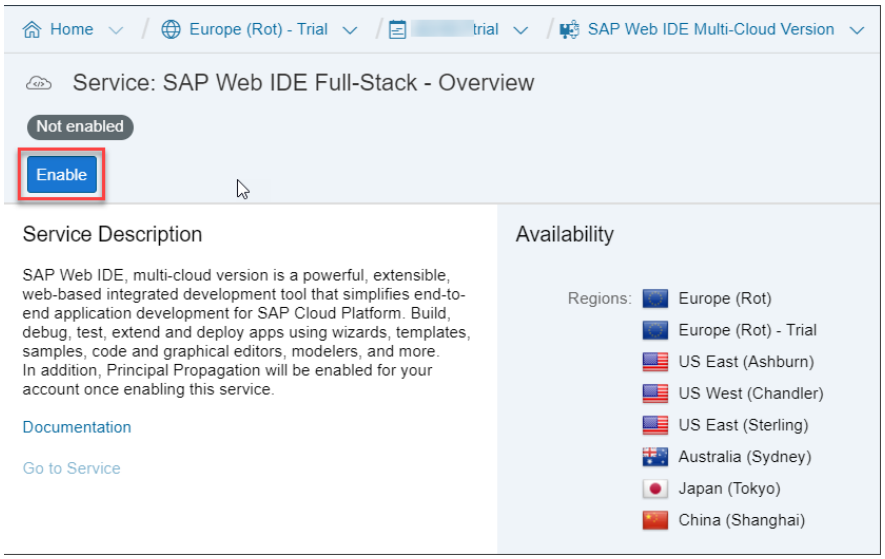
Explanation	Screenshot
To create a trial SAP Cloud Platform account, go to the following link: https://account.hanatrial.ondemand.com Press the Register button	
Enter all your details	
Accept the terms and conditions by checking both check boxes and press “Register”.	

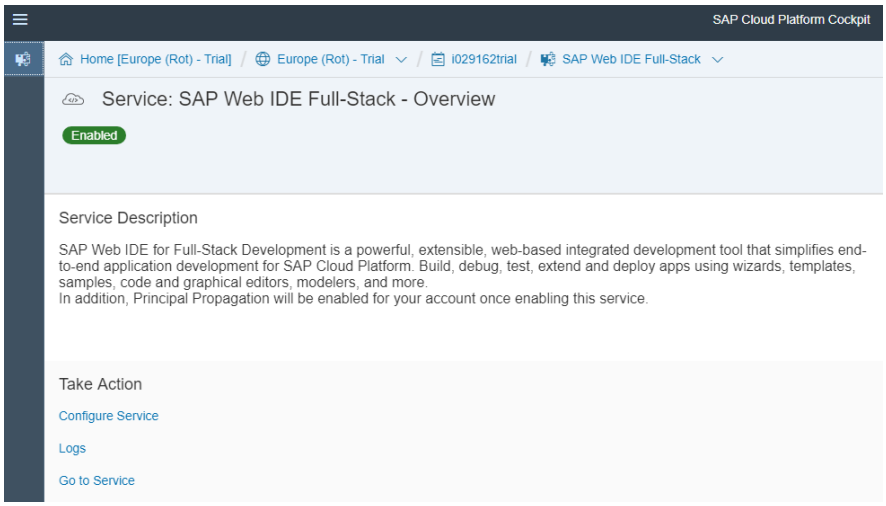
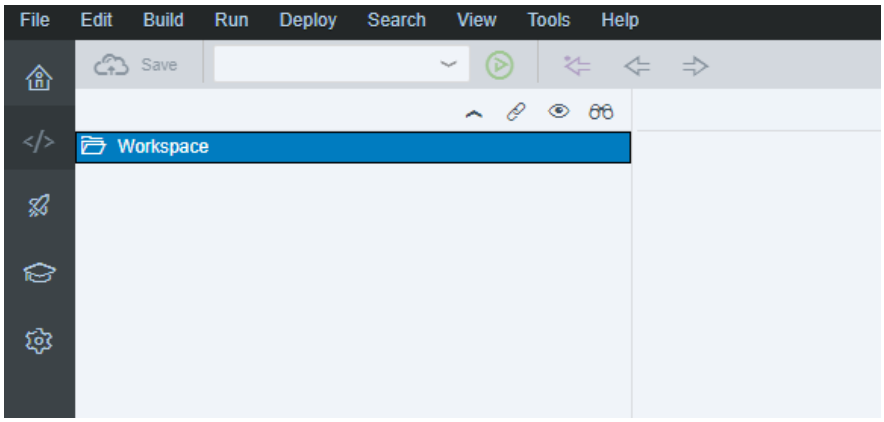
iii. Activate Web IDE Full Stack service

We will use Web IDE Full Stack for the creation and implementation of our application.
Web IDE is offered as a service on the SAP Cloud Platform.

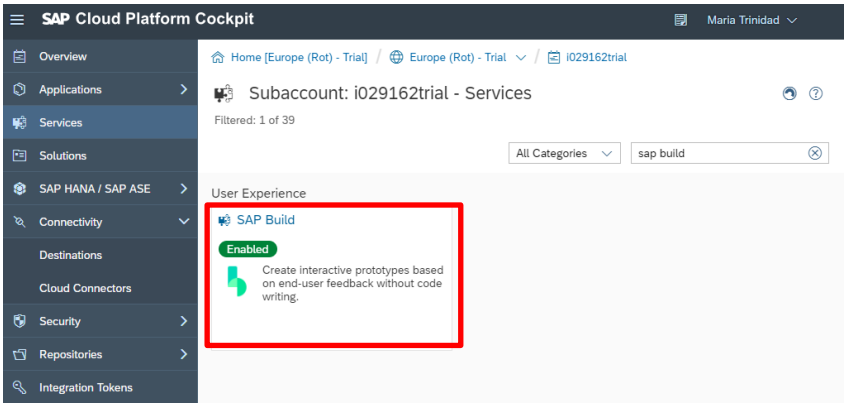
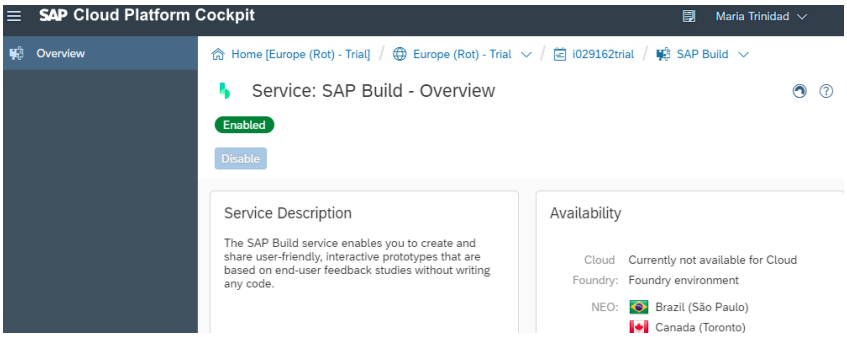
To activate Web IDE Full Stack service please follow the steps here below, if you already have Web IDE Full Stack service active in your account please skip this step.

Explanation	Screenshot
Open your trial SAP Cloud Platform account from the following link: https://account.hanatrial.ondemand.com	
Press the Log On button if you are not automatically logged in	
After login if you are proposed between Cloud Foundry Trial and Neo Trial please choose Neo Trial.	

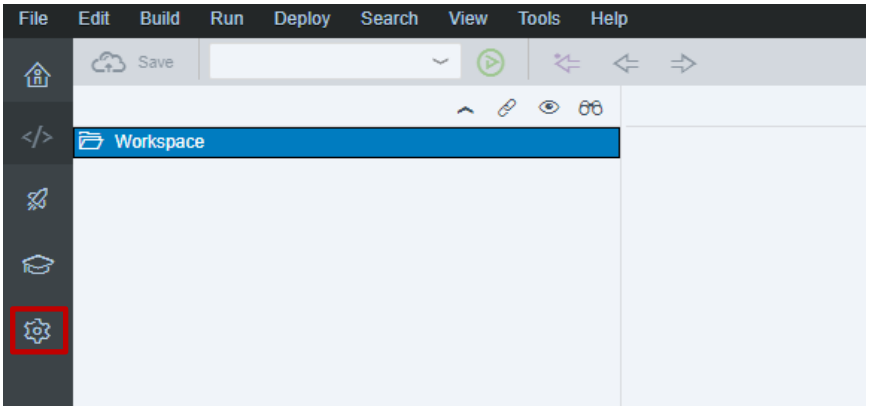
Explanation	Screenshot
Select the Services icon on the left side bar.	
Enter **Web** in the search edit text. Click on the SAP Web IDE Full Stack box.	
Click **Enable**. This may take a few minutes.	

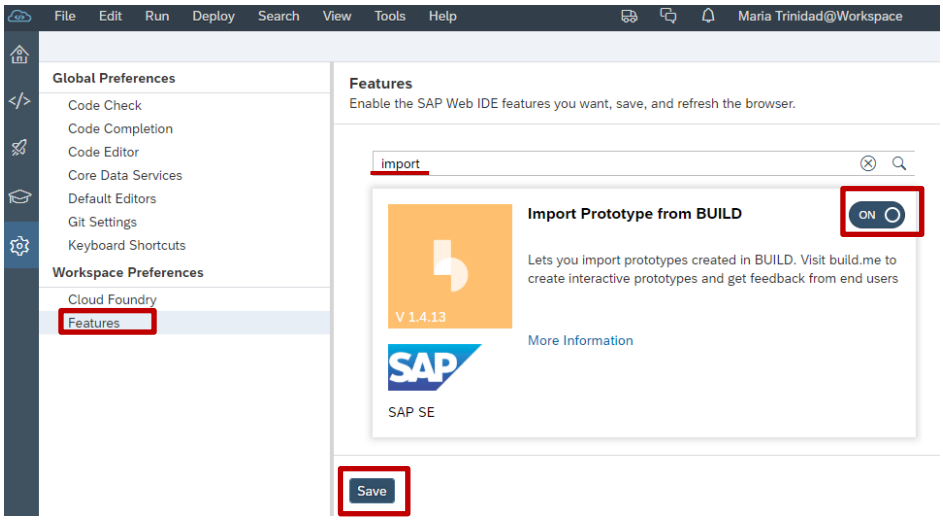
Explanation	Screenshot
Once Enabled select the link **Go to Service** to open Web IDE Full Stack.	
Web IDE opens with an empty Workspace unless you already developed applications with Web IDE in the past.	

v. Activate Build service in SAP Cloud Platform cockpit

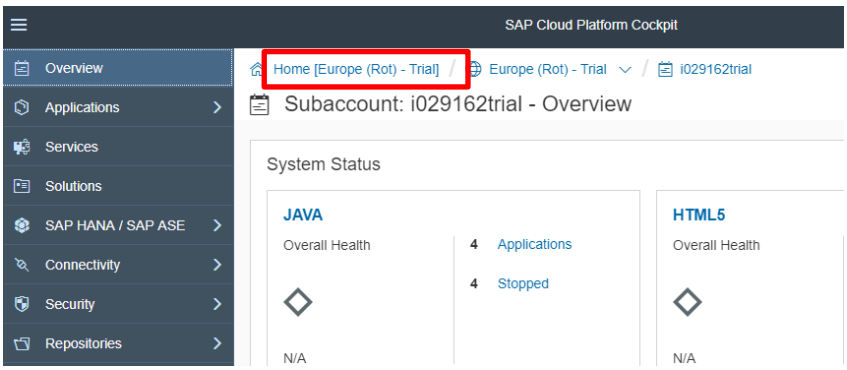
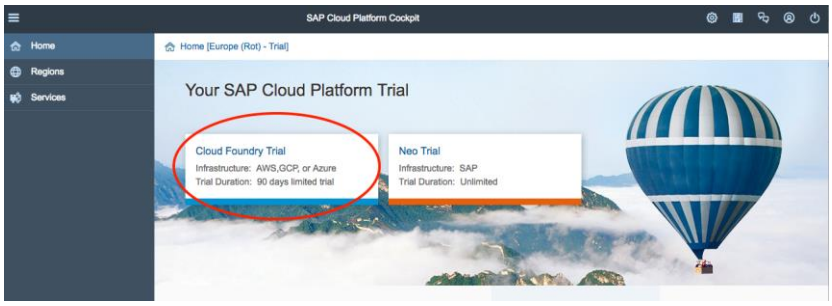
Explanation	Screenshot
We need to activate the SAP Build service. Follow similar steps as in previous prerequisite to see the list of Services. Search for SAP Build service.	
If not active select it and click the button Enable to activate it (in my case it is already Enabled).	

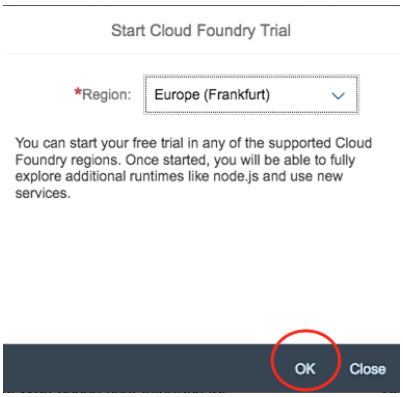
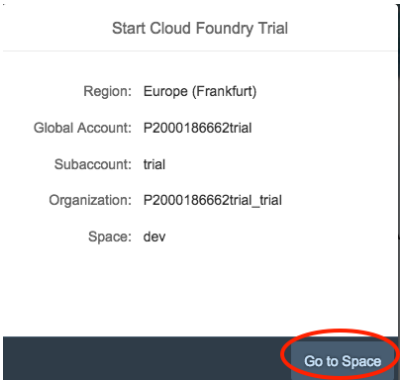
vi. Activate Build feature in WebIDE

Explanation	Screenshot
Open **SAP Web IDE Full Stack**. Check the prerequisites sections “Create a SAP Cloud platform trial account” and “Activate Web IDE Full Stack service” if you don’t know how to open WebIDE Full Stack. Click on the  **Preferences** icon.	

Explanation	Screenshot
Select **Features** menu. **Search** for **import**. Change the button to ON to get the **Import Prototype from BUILD** feature available in WebIDE. Click **Save**!	

vii. Activate a Cloud Foundry trial account

Explanation	Screenshot
We need to activate the SAP Cloud Platform Cloud Foundry Environment. On the SAP Cloud Platform Dashboard click on the **HOME** link.	
From the SAP CP Home Screen, click on **Cloud Foundry Trial.**	

Explanation	Screenshot
Select the Trial Region that suits your location. And Click on **OK**	
This will initialize your Cloud Foundry Trial and create a DEV space (where the solutions will be deployed).	

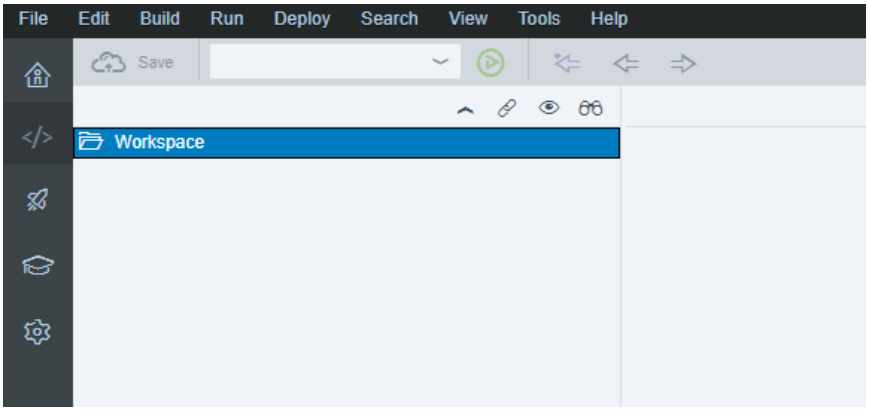
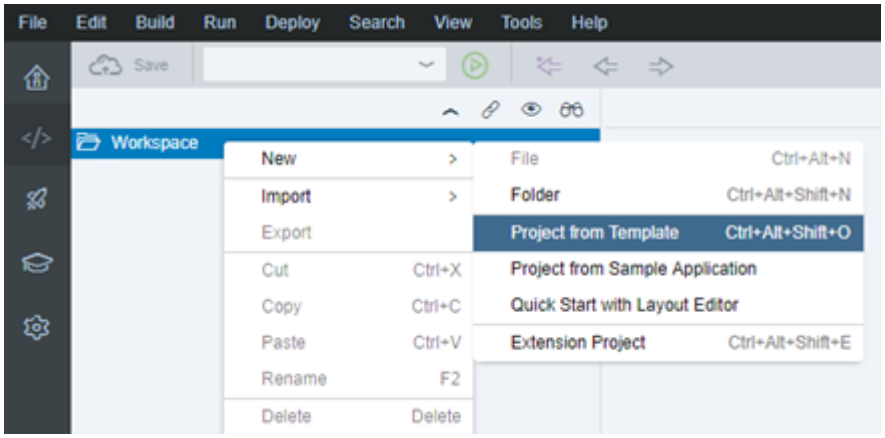
STEP 1: CREATE A BUILD HIGH FIDELITY PROTOTYPE

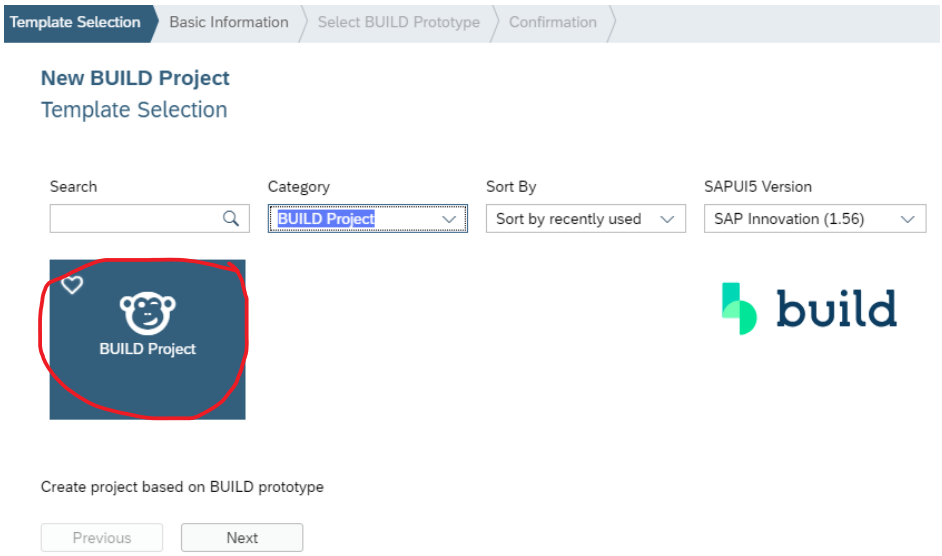
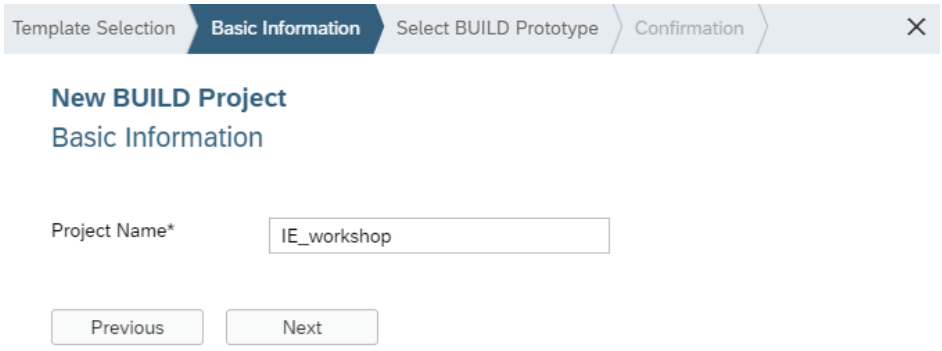
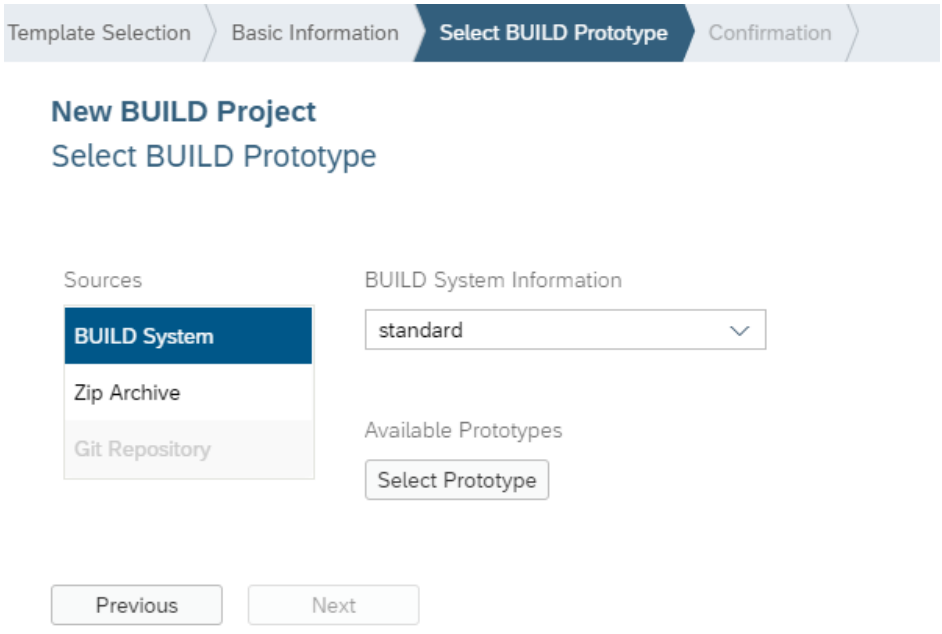
Follow the steps of the HandsOn_Build_B1_Instructions.pdf document.

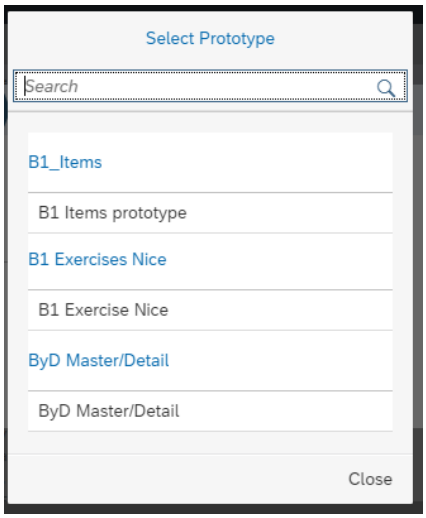
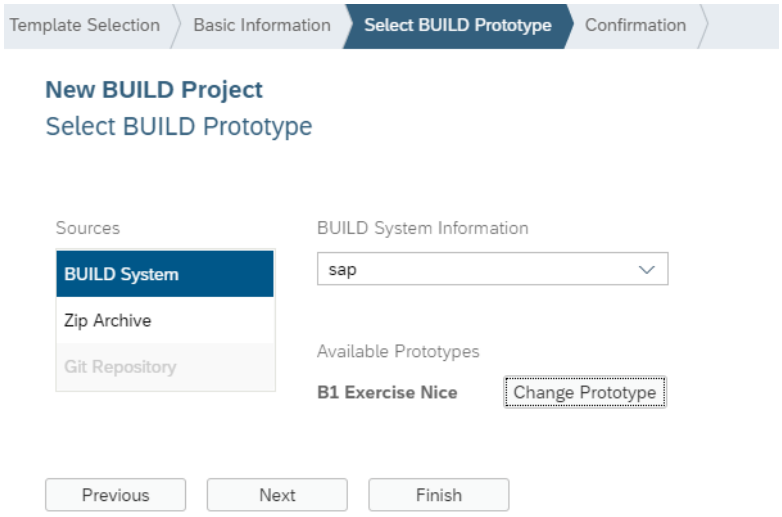
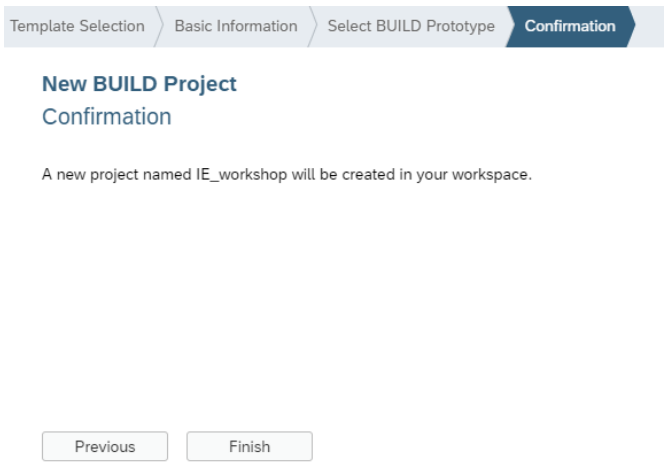
STEP 2: IMPORT YOUR BUILD PROTOTYPE INTO WEBIDE

The objective of this first exercise is to create a SAP Fiori app from your Build prototype.

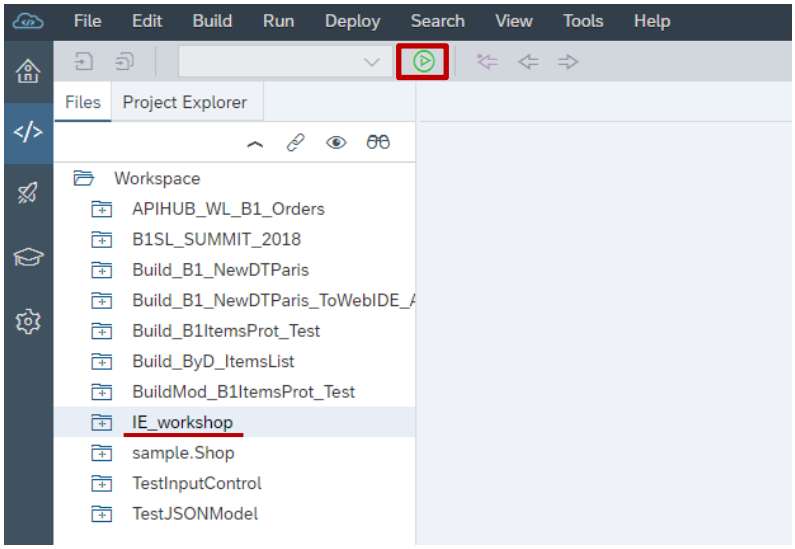
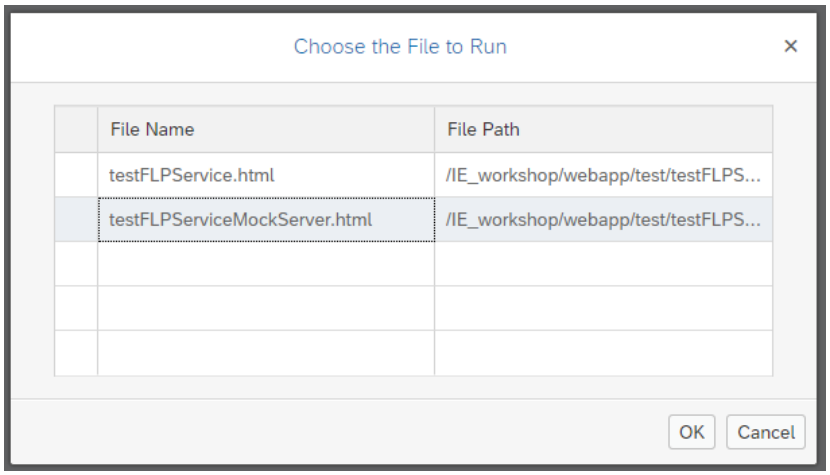
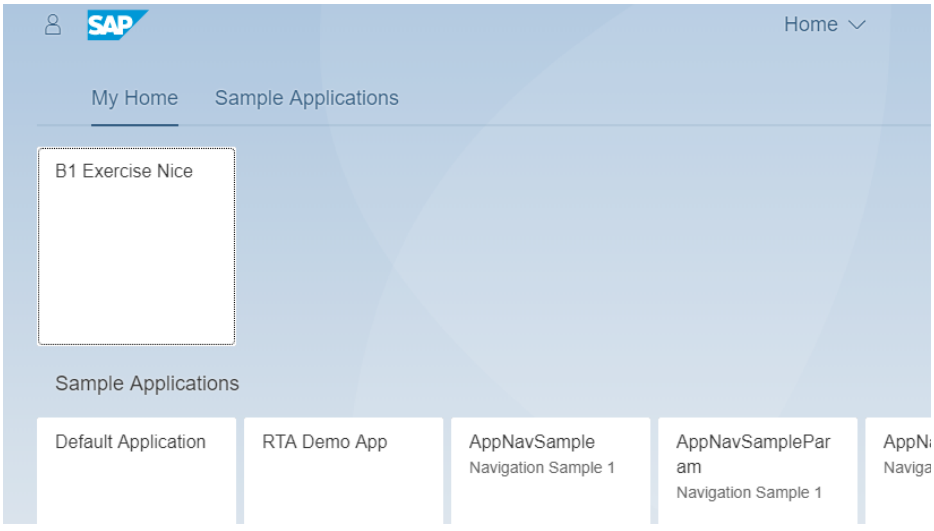
i. Create the Project

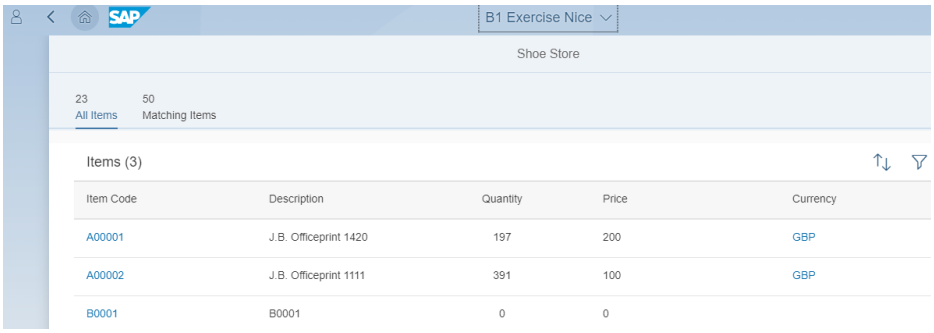
Explanation	Screenshot
Open SAP Web IDE Full Stack. Check the prerequisites sections “Create a SAP Cloud platform trial account” and “Activate Web IDE Full Stack service” if you don’t know how to open WebIDE Full Stack.	
Right click on your Workspace and select **New -> Project from Template**.	

Explanation	Screenshot
Select the **BUILD Project** template. Press **Next**. If you don't see this template, change the Category to **BUILD Project** or **All categories**.	
Enter a **Project Name**. Press **Next**.	
Select **BUILD System** source. Select **standard** BUILD System Information. Press **Select Prototype** to get the list of available BUILD prototypes. *You might be prompted to enter your BUILD User Name and Password. Enter your credentials and press Log In.*	

Explanation	Screenshot
Select the prototype you shared previously in BUILD. Press **Close**.	
Press **Next**.	
Press **Finish**.	

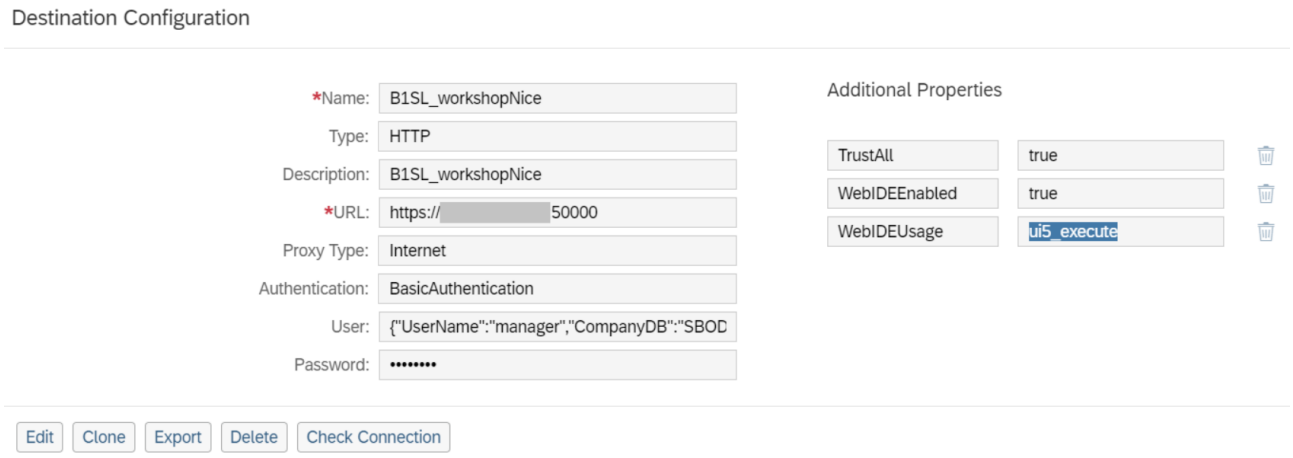
ii. Test the project with mock data

Explanation	Screenshot
Go to your workspace, the new project should be listed. Select your project and press the Run button.	
Select the **testFLPServiceMockServer.html** to run the application with the mock data we prepared in BUILD. Press **OK**.	
A new tab will be open and show an SAP Fiori launchpad. **Select the tile on the launchpad that corresponds to the name your BUILD prototype application**.	

Explanation	Screenshot
Your application will now open and show the views you designed with BUILD.	

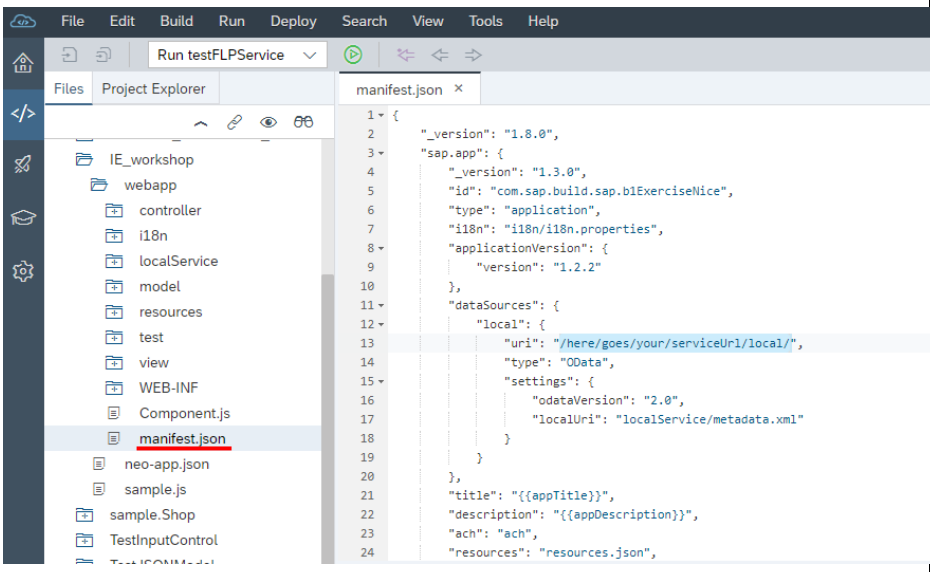
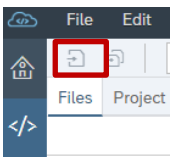
iii. Create a destination pointing to your backend server

On the SAP Community From SAP API Business Hub to your SAP Business One system blog dedicated to SAP API Business Hub it is explained how to create a destination in SAP Cloud Platform pointing to your SAP Business One backed server. Please check step number 1 of this blog to learn how to create a destination.

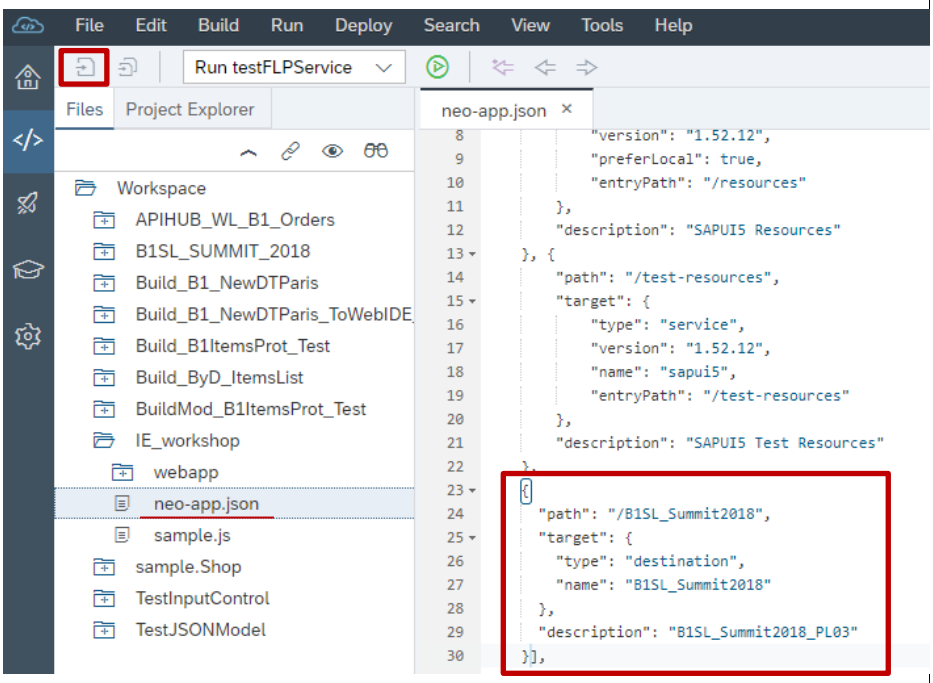


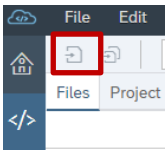
iv. Connect to your real B1 backend server

We have imported the BUILD prototype into a WebIDE SAP Fiori project, but we are still not connected to a real backend server. This section will show you how to modify the SAP Fiori project to connect to your real B1 backend server.

Explanation	Screenshot
In SAP Web IDE workspace, expand your project. In the **webapp** folder, **open** the **manifest.json** file with the code editor.	
In the **manifest.json** file. Replace the **uri** property value under **dataSources** section with your backend OData service path. The uri is built from your **destination name** (in my case /B1SL_Summit2018) plus **the root Service Layer path for OData v4** (/b1s/v2).	
Press **Save** button.	

Explanation	Screenshot

Open **neo-app.json** file.
 	
Add your **backend destination** entry to fetch data.
 	
,{
"path": "/**yourdest**",
"target": {
"type": "destination",
"name": "**yourdest**"
},
"description":"yourdesc"
}
	

Press **Save** button.	

v. Extra SAP Business One backend configuration steps

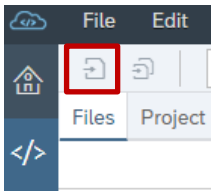
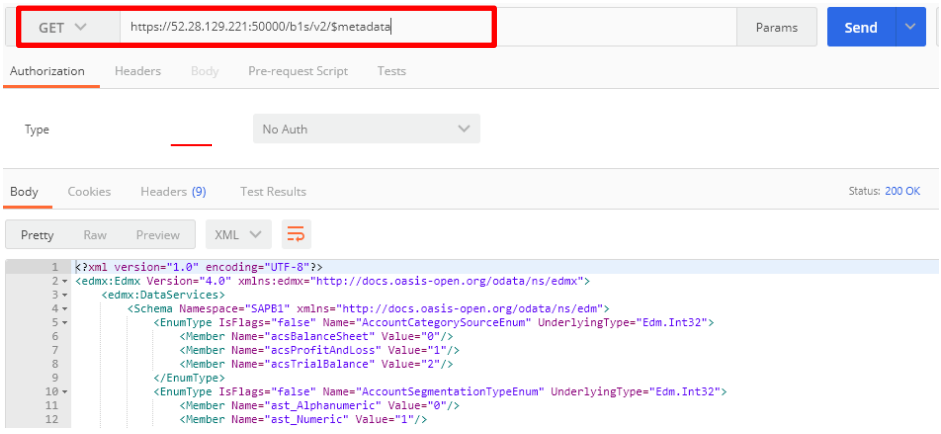
As at the time we have created this document SAP BUILD doesn't support yet OData v4 and SAP Business One Service Layer APIs are based on OData v4, to design our SAP Business One Build prototype we had to use a custom OData model in SAP Build to design our prototype. Therefore, the WebIDE project will not directly run after the changes done in previous steps but some extra steps will be required.

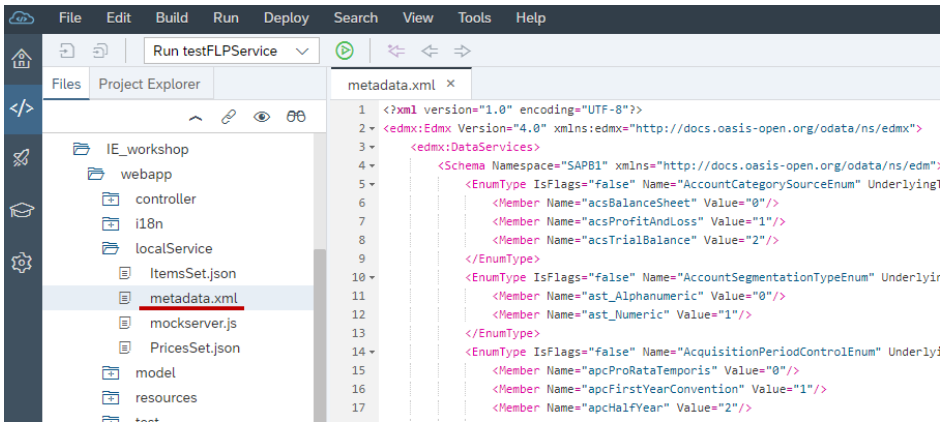
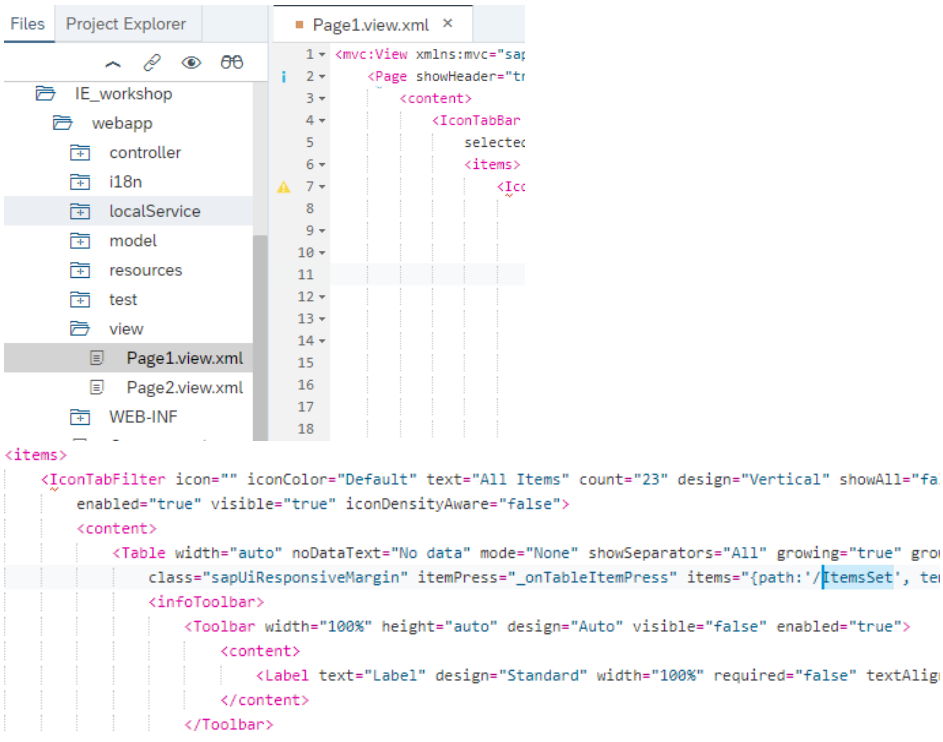
As SAP WebIDE supports OData v4 we can now replace the custom OData model we designed in SAP Build by the real SAP Business One Service Layer OData model to get SAP Business One data from our backend.

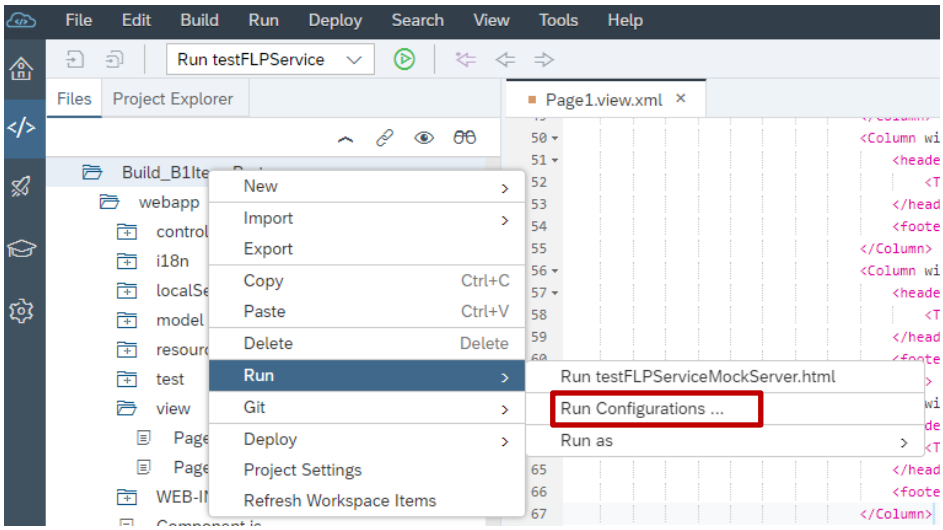
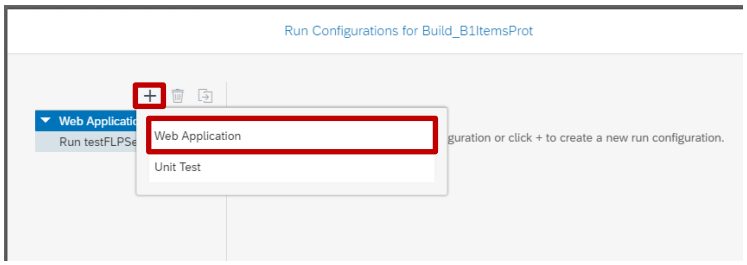
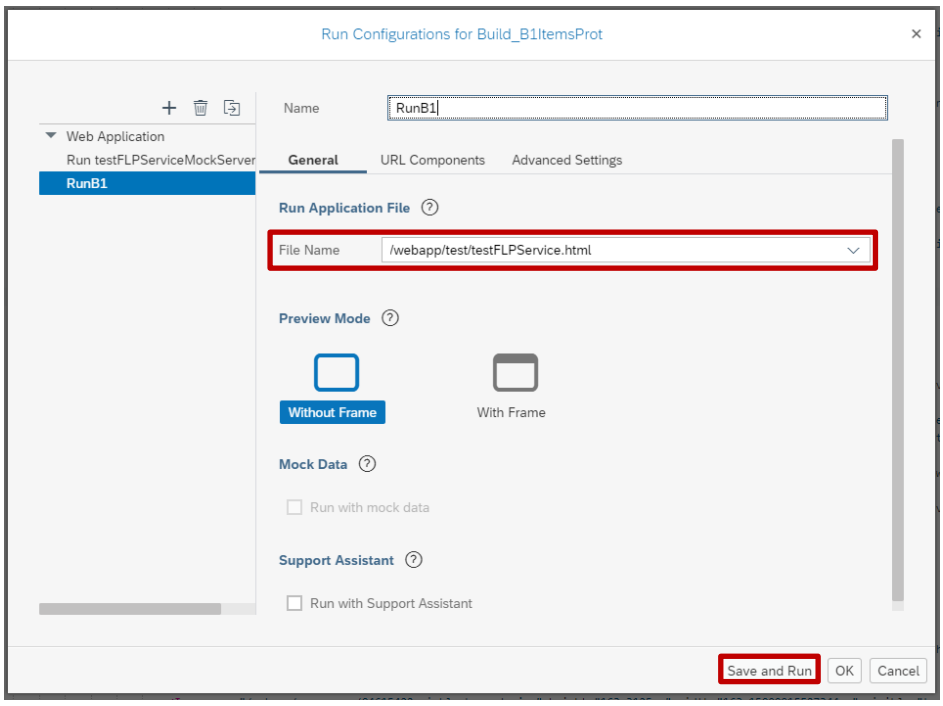
Explanation	Screenshot
Open the **manifest.json** file. Change the **“settings” “odataVersion”** to **4.0**.	
Search **models** element inside sap.ui5	

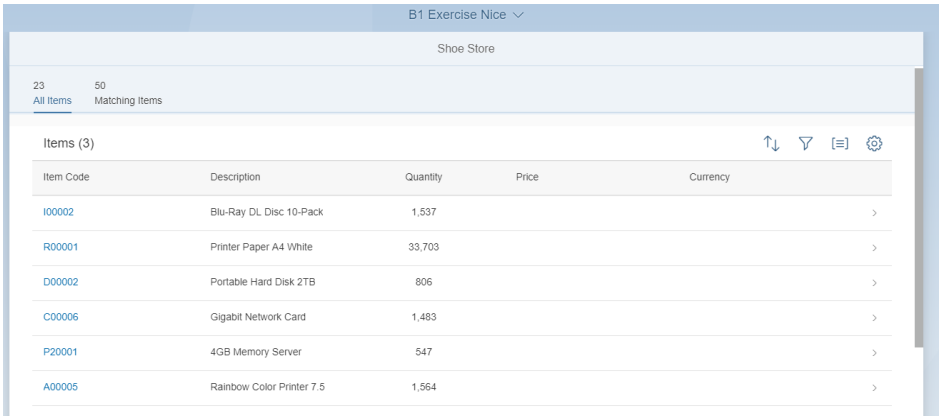
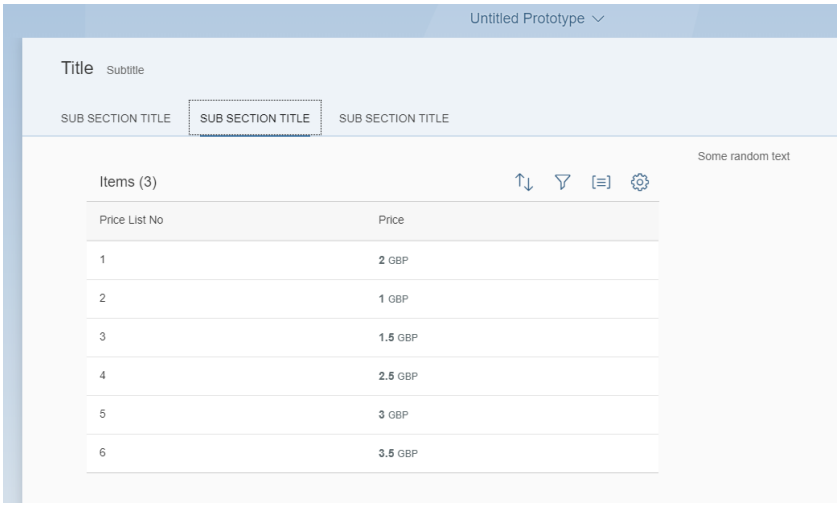
Explanation	Screenshot

Replace the **type** of the model with empty name by **sap.ui.model.odata.v4.ODataModel**.
 	
Change the **settings** and add **preload** property **true**.
 	
Pay attention you keep the dataSource value unchanged as it matches the dataSource value defined at the beginning of the file.
 	
`"settings": {`
`"operationMode": "Server",`
`"synchronizationMode": "None",`
`"groupId": "$direct"`
`},`
`"preload": true`
	

Press the **Save** button.	
Retrieve the metadata file from SAP Business One Service Layer via **Postman** with the **GET** request https://your_b1sl_server:50000/b1s/v2/$metadata. **Save** the response as a file named **metadata.xml**.	

Explanation	Screenshot
Replace the **localService/metadata.xml** file imported from BUILD by the SAP Business One Service Layer metadata file saved in the previous step. To avoid conflicts as the Build metadata.xml file is already there you can rename the existing file as **build_metadata.xml**.	
Open the **Page1.view.xml** file, search for **ItemsSet** and replace it by **Items**. In the model we created in BUILD entities have the suffix Set, while in SAP Business One Service Layer we don't have it, we need to fix it to be able to directly connect to Service Layer.	
Open **Component.js** file. Replace **ItemsSet** by **Items** in the navigationWithContext definition.	

Explanation	Screenshot
To run the application this time connecting to your real B1 backend right click on your project and choose **Run -> Run Configurations…**	
Press +. Select Web Application.	
Give a **Name** to the new configuration. Select **testFLPService.html** as File Name. Press **Save and Run**.	

Explanation	Screenshot
Now the data shown comes from B1 and not anymore from the Build sample data.	
You can also check the details page containing the different prices depending on their price list for a specific Item by clicking on one of the rows.	

Congratulations! You have imported a Build prototype to your WebIDE development environment and connected to your real SAP Business One backend server.

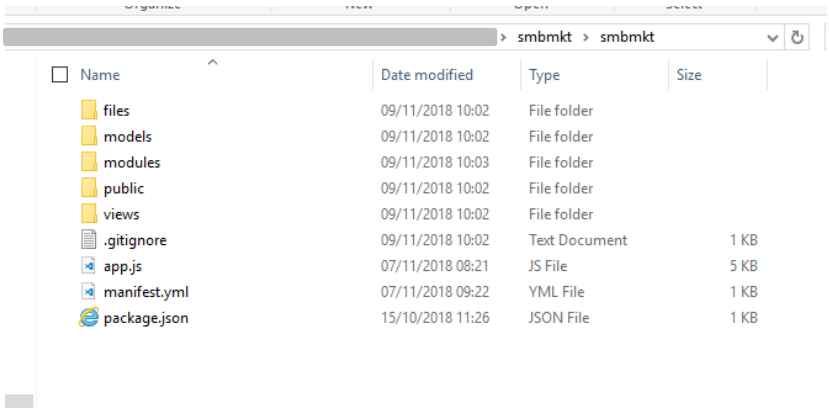
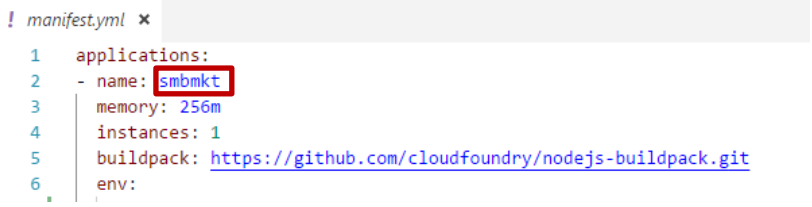
STEP 3: CLONE A NODEJS APP

In this step we are going to deploy the backend of our application.

The application we are going to deploy is based on the SMB Marketplace proof of concept we shared in the Digital Transformation for SMBs – the Intelligent Enterprise blog.

It will contain the business logic required to call SAP Leonardo services and get Item details from SAP Business One and SAP Business ByDesign erps.

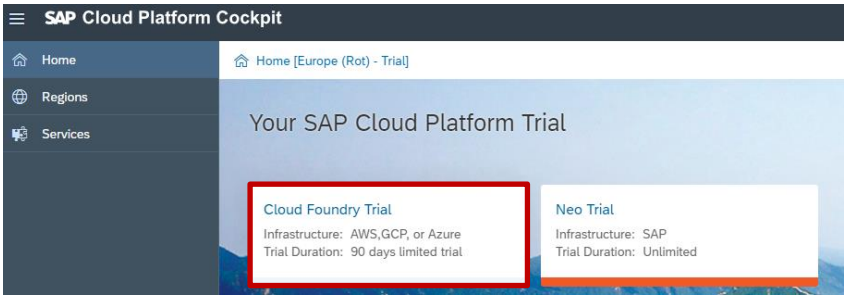
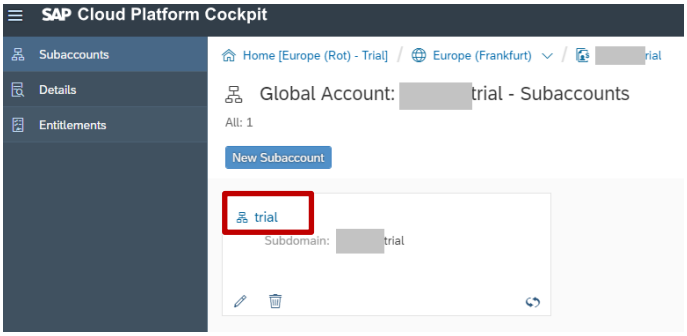
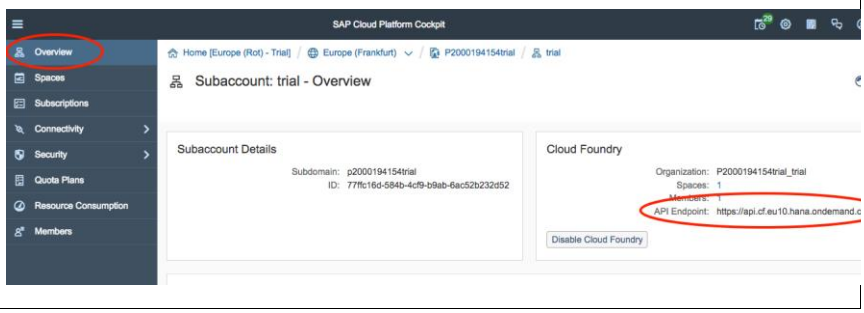
The application is written in NodeJS and the source code is available on GitHub.

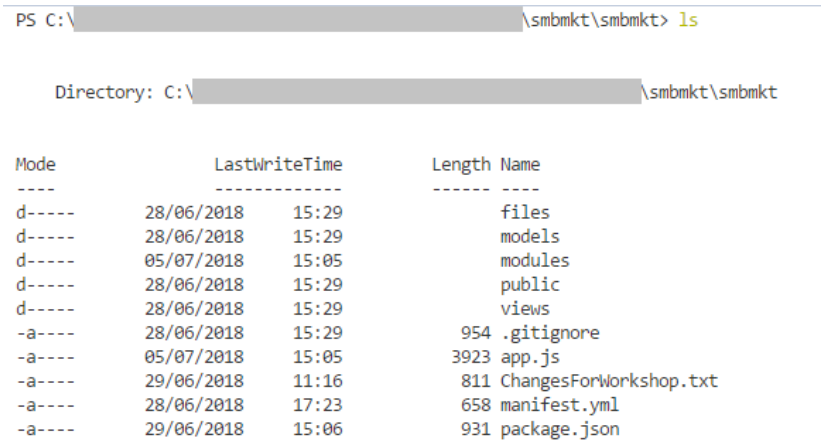
Explanation	Screenshot
Once **git** is installed (according to the pre requisites), open your system **terminal** (cmd, bash..) **Navigate** to a specific folder where you will download the sample application. **Pay attention** what folder is it, we will access it later.	
Execute the following command to clone our solution: `$ git clone -b CF_exercise https://github.com/B1SA/smbmkt.git`	
Go to the directory smbmkt/smbmkt, this is the folder containing the code we will push into	
You can change the name of the app in **manifest.yml** file and set a unique name for your application, e.g.: ***smbmkt<your Initials>***. It is not a mandatory operation as we can generate a random url for our application to avoid conflicts with other accounts running the same app name, it will be shown in the next step.	

STEP 4: DEPLOY THE NODEJS APP INTO SAP CLOUD FOUNDRY

In this step, we are going to deploy our SMB Marketplace app to SAP Cloud Platform Cloud Foundry.

i. SAP Cloud Platform Cloud Foundry Environment

Go to your Cloud Foundry account.	
Select your trial subaccount. Click on the **trial link.**	
Open the **Overview option** in the menu **Select and copy your API Endpoint**. E.g. https://api.cf.eu10.hana.ondemand.com	

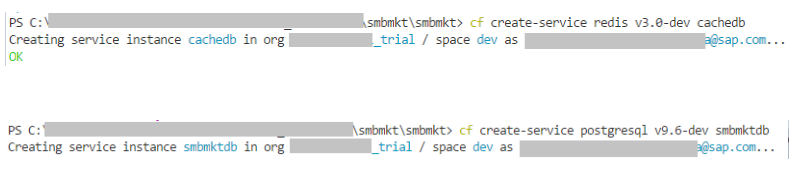
With the CLI installed (according to the pre-requisites), open your system **terminal** and navigate to the folder of the backend app cloned on STEP 3 of this guide	

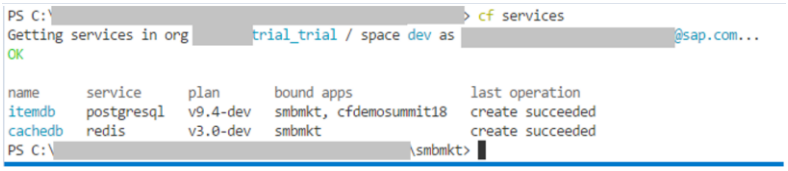
From that folder, login to Cloud foundry using the command
 	
`cf login -a <API ENDPOINT>`
 	
e g.
 	
`$ cf login -a api.cf.eu10.hana.ondemand.com`
 	
When prompted provide your SAP Cloud Platform email and password
	

ii. Create the backing services

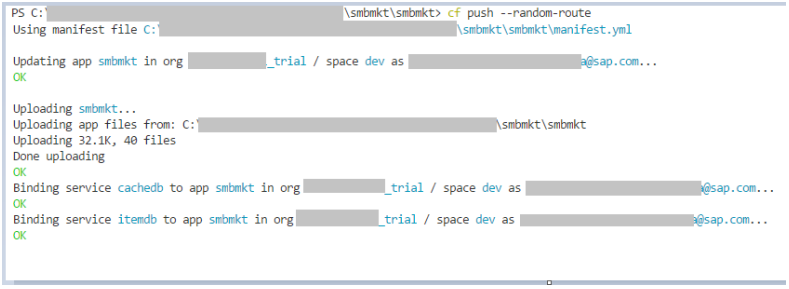
This app uses 2 backing services from SAP Cloud Platform. Redis for storing B1 Service Layer Sessions ID in cache and PostgreSQL to store SAP Leonardo Feature Extraction Vectors.
Here are the steps to create them:

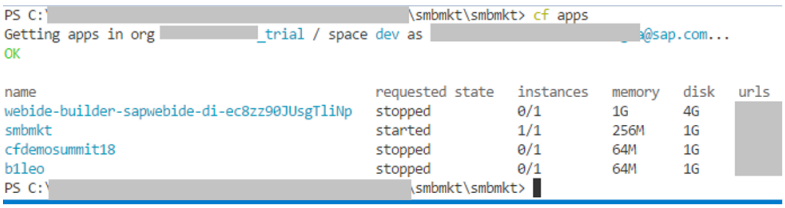
Explanation	Screenshot

Using the command terminal, navigate to the smbmkt directory.
 	
Execute the following commands to create the Redis and PostgreSQL services:
 	
`cf create-service redis v3.0-dev cachedb`
 	
`cf create-service postgresql v9.6-dev itemdb`
	

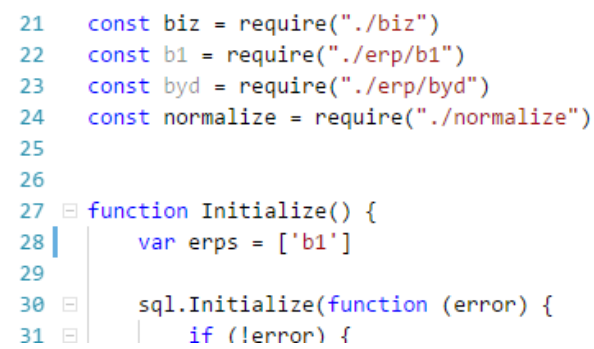
Explanation	Screenshot
PS: When using a trial account some limitations apply. If you already had a postgresql or redis service you will not be able to create a second one, just reuse the one you have or delete your old one.	
You can check which services are active and the bound apps with the command: `cf services` (your services might not be bound to any app if just created now)	

iii. Deploy the smbmkt app

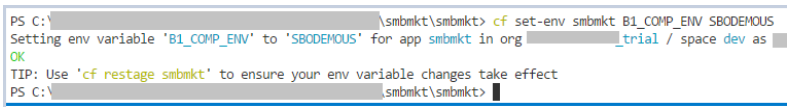
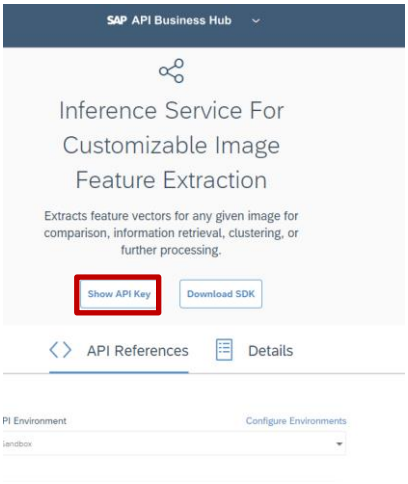
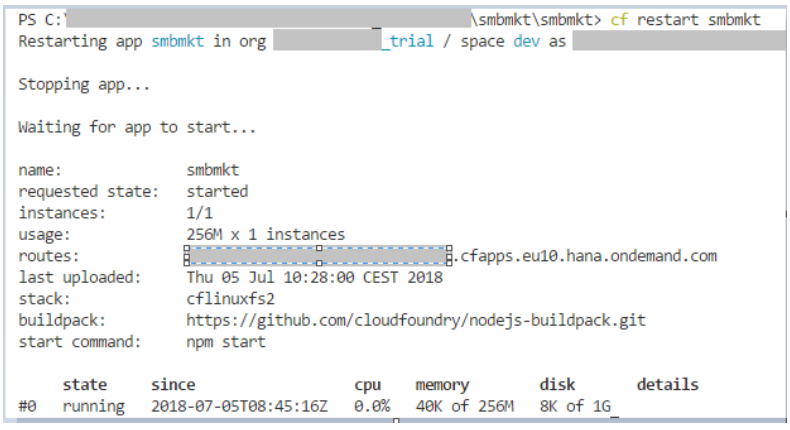
Explanation	Screenshot
This app has 2 microservices (bot and smbmkt) that can be deployed at once or separately. Their specifications are detailed in the manifest.yml. In this exercise we will only work with the smbmkt microservice as the other service is the one related to Facebook Messenger that is not used in this exercise. From the same terminal of the previous step go to your smbmkt/smbmkt app folder and execute: `cf push --random-route` *--random-route avoids name collisions with other accounts that might deploy the same app on SCP. You can choose your own app name by changing the application names in the manifest.yml.*	

Explanation	Screenshot
At the end of the process your smb app must be running. You can check your apps with the command: `cf apps`	

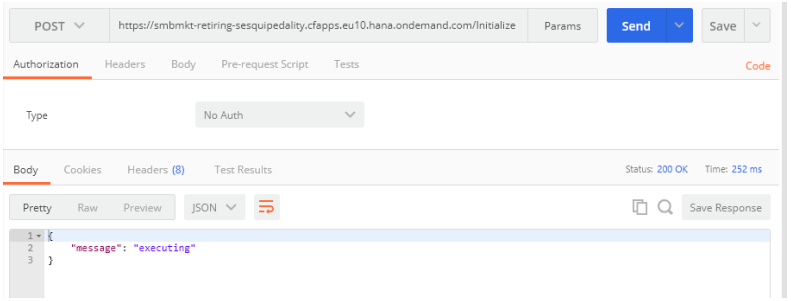
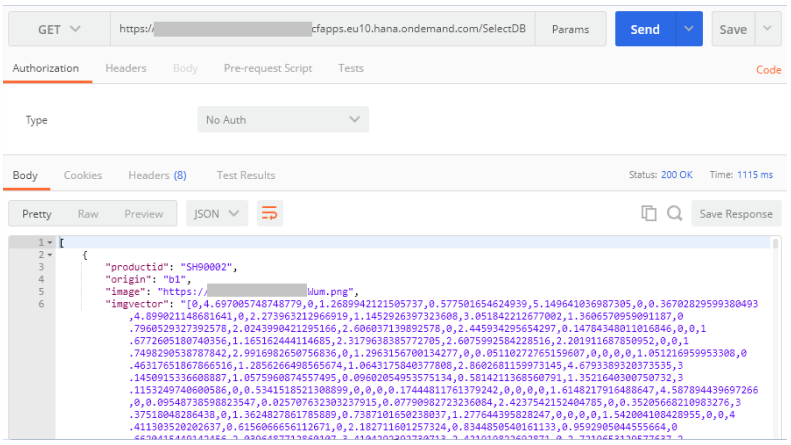
i. Configuration for only B1 or ByD systems

Explanation	Screenshot
If you don't have a B1 or a ByD system (you need at least one of them) please follow this section. Go to the directory smbmkt/smbmkt/modules. Open the file start.js. Search for the Initialize function, keep in the array only the ERP you have a connection to and have been defined in the environment variables. In my case I just kept a b1 system here. E.g. 'b1' for SAP Business One.	
Run cf push command again to reflect the changes on the start.js file. `cf push`	

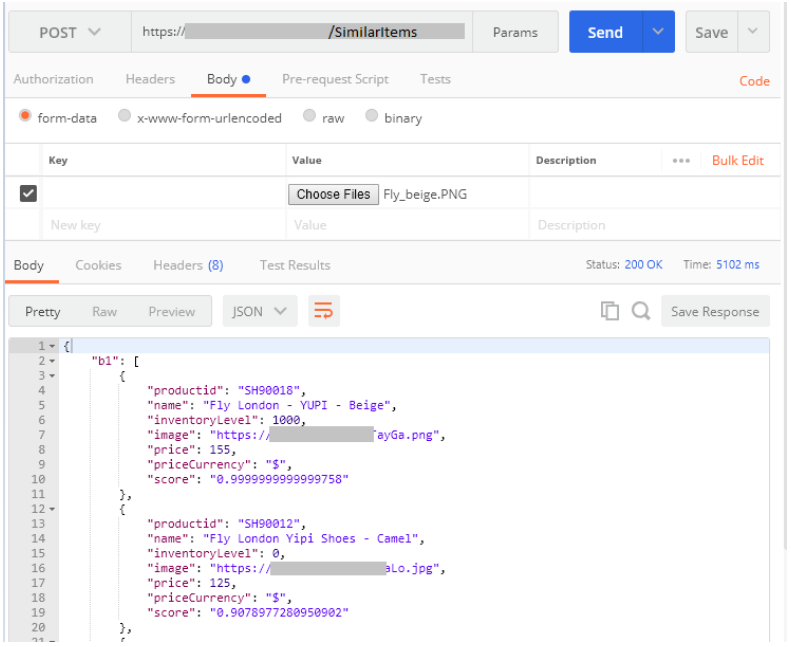
ii. Configure the SMB Mktplace backend

Explanation	Screenshot
Set the following <u>Environment Variables</u> so the app can work properly. The ones marked in red are mandatory for a B1 configuration. Please note that you need at least one ERP system from both to be able to retrieve items data. If you don't have a B1 or ByD system available, you can then skip its corresponding environment variable.	**B1_COMP_ENV**: <SAP Business One Company Name> **B1_DEFAULT_BP**: <A Business Partner Code for the B1 Sales Order> **B1_USER_ENV**: <B1 User to login the Service Layer> **B1_PASS_ENV**: <Password for the B1 User> **B1_SERVER_ENV**: <SAP Business One server URL> **B1_SLPATH_ENV**: /b1s/v1 **B1_SLPORT_ENV**: <SAP Business One Service Layer Server Port> BYD_AUTH: <[Base64 Encoded] user:password> BYD_DEFAULT_BP: <A Business Partner Code for the ByD Sales Order> BYD_PATH: /sap/byd/odata/cust/v1 BYD_PORT: "" BYD_SERVER: <SAP Business ByDesign server URL> FILE_SEP: -_-_ **LEO_API_KEY**: <SAP Leonardo API Key> TEMP_DIR: files/tmp VECTOR_DIR: files/vectors
Set one by one the environment variables with the command: `cf set-env smbmkt B1_COMP_ENV SBODEMOUS`	
To obtain the SAP Leonardo API Key please open the following link SAP Leonardo Feature Extraction Vectors and press the button "Show API Key".	
Restart your application so it can get the new environment variables with the following command: `cf restart smbmkt`	

iii. Initialize the SMB Mktplace backend

Explanation	Screenshot
To initialize the Postgresql database with the existing items from B1 and ByDesign as well as the vectors for each item please call the following API with Postman for example: POST <your_backend_url>/Initialize	
After initialization you can check the Postgresql items table content with the following API: GET <your_backend_url>/SelectDB If the Initialize command runs successfully an entry should be available for each one of your items containing the productid, origin, image and imgVector properties.	

iv. Test the SMB Mktplace backend /SimilarItems API

Explanation	Screenshot
With Postman call the /SimilarItems API: POST <your_backend_url>/SimilarItems In the **body** select "**form-data**" and choose a file containing the image of a shoe.	

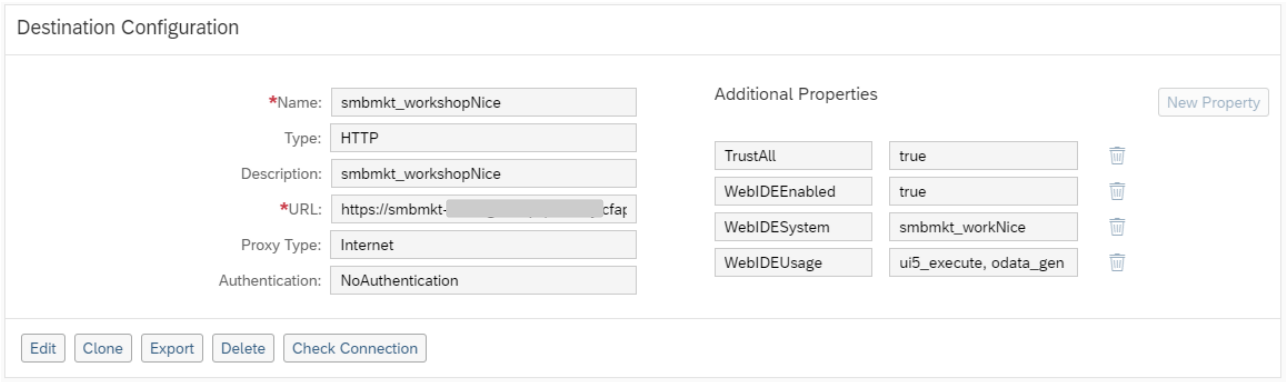
Congratulations! You have implemented and deployed your first Cloud Foundry application on SAP Cloud Platform!

STEP 5: CONSUME THE NODEJS APP FROM THE SAP FIORI APP

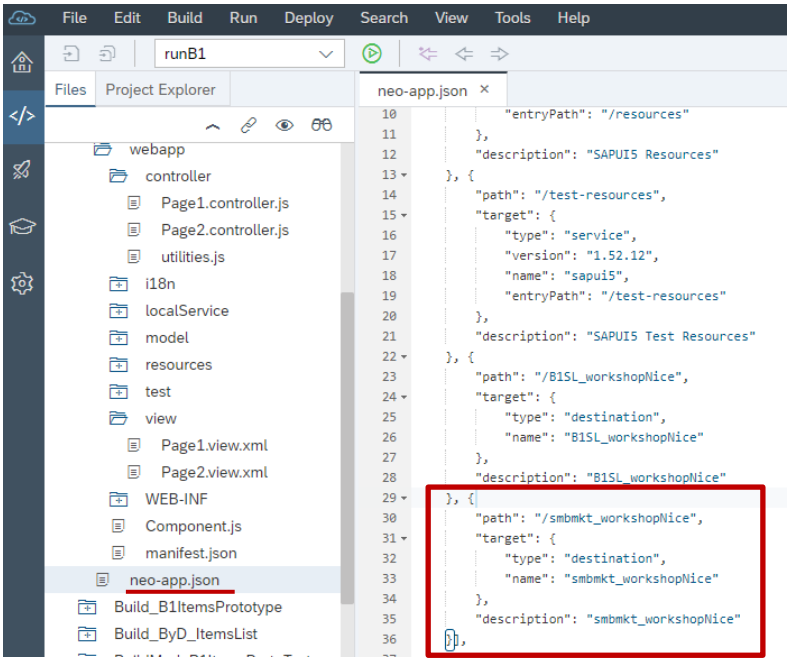
Until now our SAP Fiori application hasn't been modified and reflects exactly what was designed in BUILD. In this step we are going to modify the tab "Matching Items" to consume the services provided by our NodeJS backend.

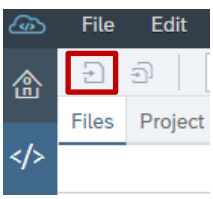
i. Create a destination pointing to your smbmkt backend

Your destination in your SAP Cloud Platform cockpit -> Connectivity -> Destinations should look like the one here, just replace the URL with your smbmkt url.
Check the following tutorial [Create a Destination on SAP Cloud Platform] to learn more details about destinations.

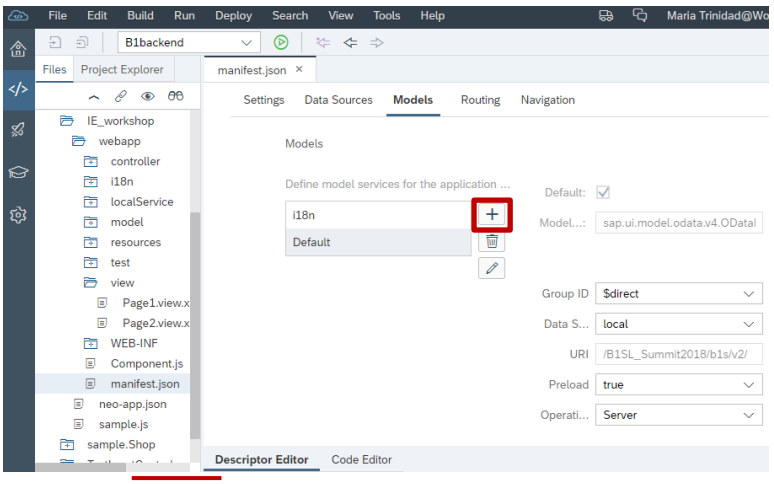
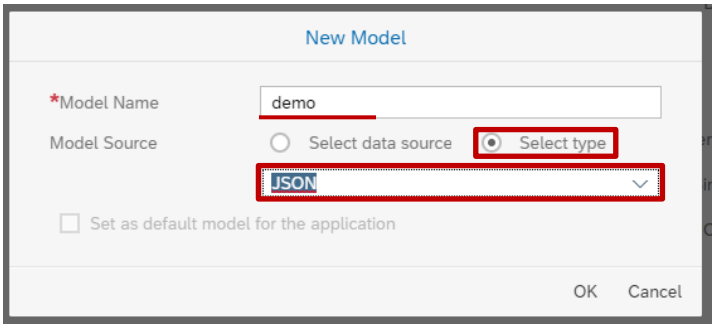
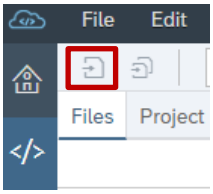


Explanation	Screenshot

Open **neo-app.json** file.
 	
Add your **backend destination** entry to fetch data.
 	
`,{`
`"path": "/yourdest",`
`"target": {`
`"type": "destination",`
`"name": "yourdest"`
`},`
`"description":"yourdesc"`
`}`
	

Press **Save** button.	

ii. Create a new JSON model

Explanation	Screenshot
Open the **manifest.json** file with the Descriptor Editor. Go to the **Models** tab. Press the + button to add a new model.	
Enter the **Model Name** of the model **demo** if you want to avoid changing the references in the following steps. Choose **Select type** as Model Source. Select **JSON** as type. Press **OK**.	
Press **Save** button.	

iii. Change the Image control in the Page1.view.xml file.

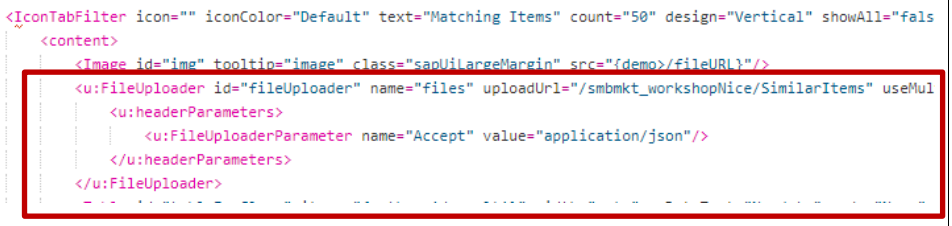
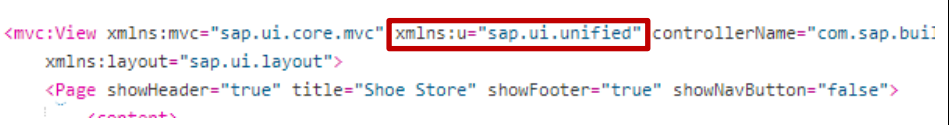
Explanation	Screenshot

Open the **Page1.view.xml** file with the Code Editor.
Search for the Image control and replace it with the following code:
`<Image id="img" tooltip="image" class="sapUiLargeMargi`
	`<IconTabFilter icon="" iconColor="Default" text="Matching Items" count="50" design="Vertical" s`
	`<content>`
	`<Image id="img" tooltip="image" class="sapUiLargeMargin" src="{demo>/fileURL}"/>`

Explanation	Screenshot
n" src="{demo>/fileURL}"/ >	

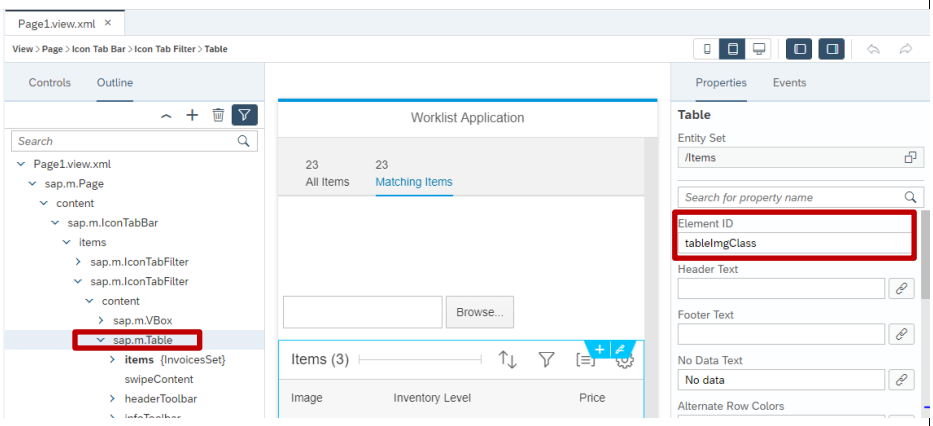
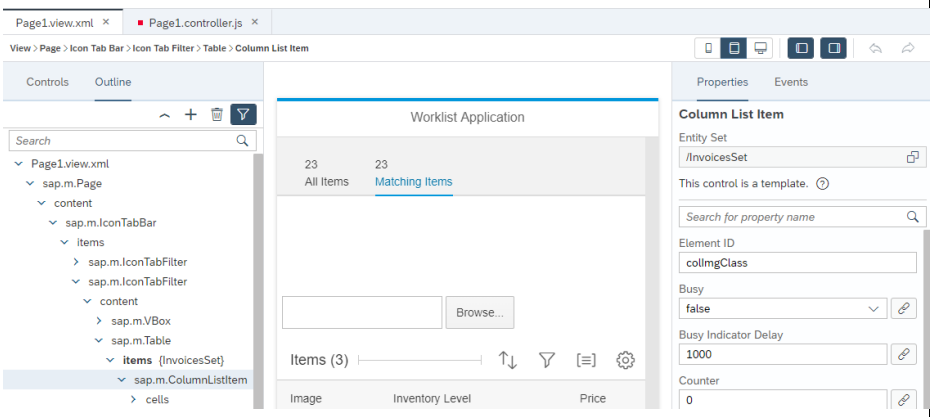
iv. Create a FileUploader control.

In BUILD we added a SearchField control as the FileUploader control was not available. We will now replace it with a FileUploader.

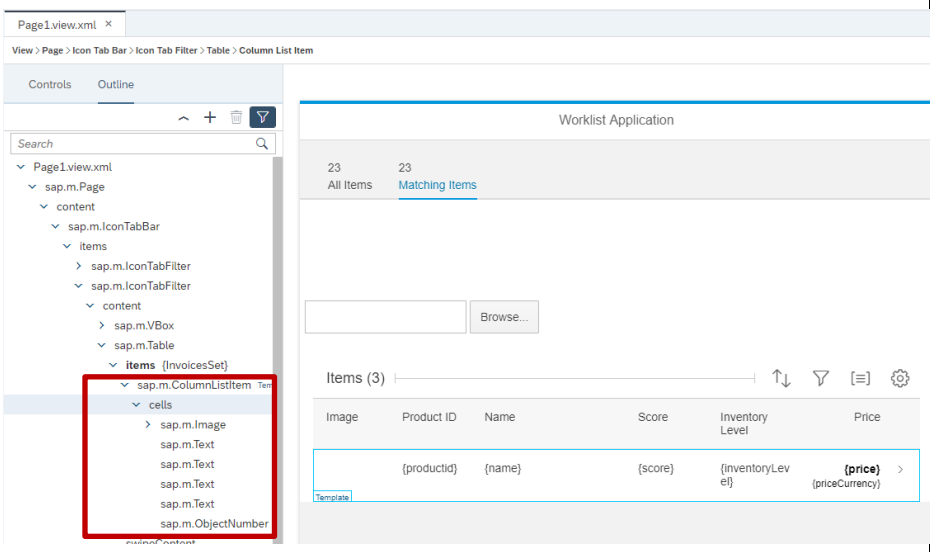
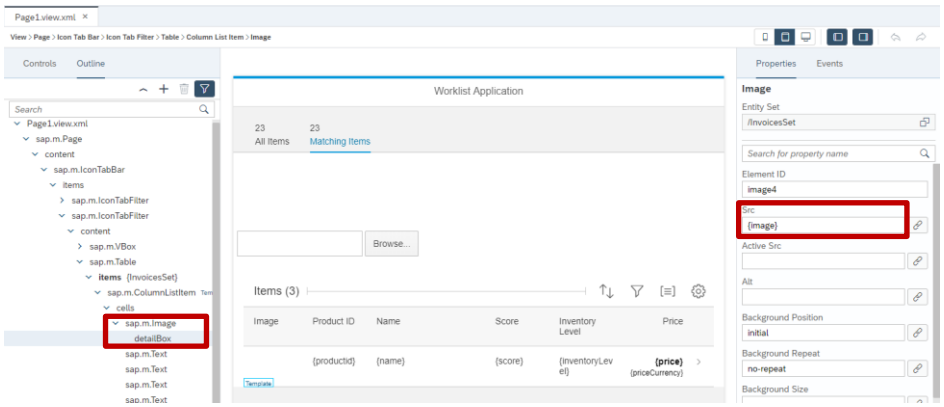
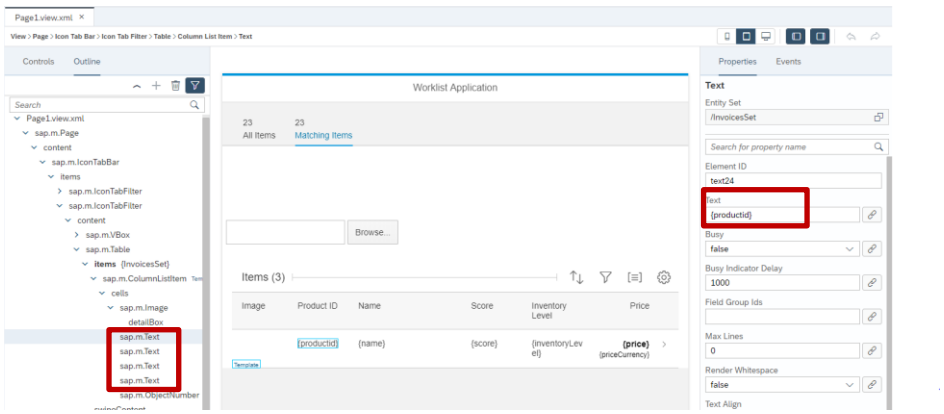
Explanation	Screenshot
Open the **Page1.view.xml** file with the Code Editor. Search the SearchField control and replace it by the following code. We use the smbmkt destination created in a previous step to get the SimilarItems url. **Replace smbmkt_destination with your smbmkt destination name.**	 <u:FileUploader id="fileUploader" name="files" uploadUrl="/smbmkt_destination/SimilarItems" useMultipart="true" sendXHR="true" uploadOnChange="true" tooltip="Upload your file to the local server" fileType="jpg,png,gif" mimeType="application/x-zip-compressed,application/zip,application/octet-stream,image/png,image/jpg,image/jpeg,image/bmp,image/tiff" change="fileUploadChange" uploadStart="fileUploadStart" uploadComplete="fileUploadComplete"> <u:headerParameters> <u:FileUploaderParameter name="Accept" value="application/json"/> </u:headerParameters> </u:FileUploader>
Add the prefix **xmlns:u="sap.ui.unified",** required by the FileUploader control, at the beginning of the Page1.view.xml file.	

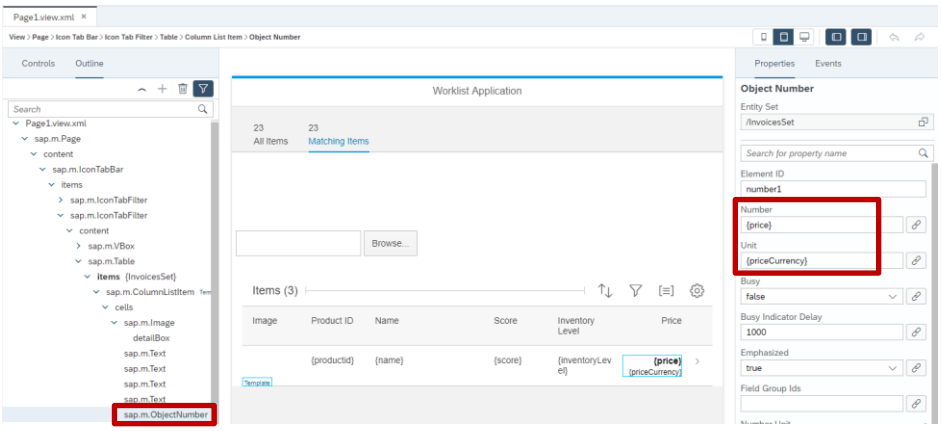
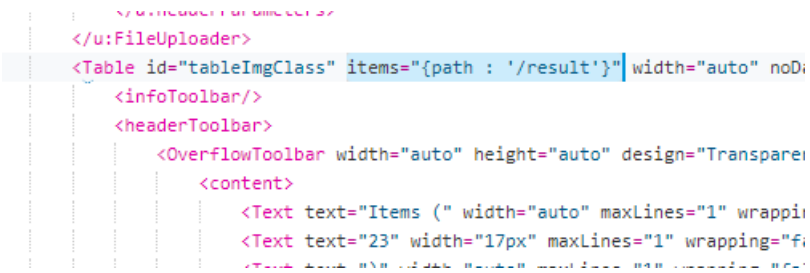
v. Bind the Matching Items Table to our backend properties

Let's define first the IDs of our Table and ColumnListItem controls, we will need them to further bind them to our backend response.

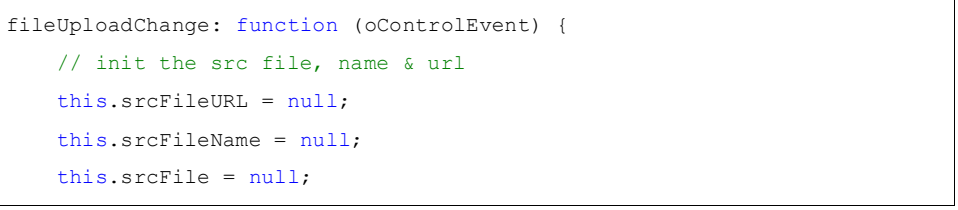
Explanation	Screenshot
Open the **Page1.view.xml** file with the Layout Editor. In the Outline tab (left of the screen) open the second IconTabFilter content and select the **sap.m.Table**. In the Properties tab (right of the screen) enter **tableImgClass** as **Element ID**.	
In the Outline tab (left of the screen), inside the sap.m.Table we selected in previous step now select the **Items -> sap.m.ColumnListItem** element. In the Properties tab (right of the screen) enter **colImgClass** as **Element ID**. If you have more than one ColumnListItem you can remove them.	

Now let's map each column in the Table to our backend response properties.

Explanation	Screenshot
Open the **Page1.view.xml** file with the Layout Editor. Open the Outline tab (left of the screen) and select the **sap.m.ColumnListItem -> cells** element. Make sure you get 6 cells defined with the types as marked in the screen capture. Maybe the easier is to delete them and recreate them in the right order.	
For the **sap.m.Image** open the **detailBox** and enter ***{image}*** in the **Src** property.	
For the cells of type sap.m.Text go over them and set the Text property to the different properties names returned by the smbmkt backend: {productid} {name} {score} {inventoryLevel}	

Explanation	Screenshot
For the last cell of type **sap.m.ObjectNumber** set the property **Number to {price}** and **Unit to {priceCurrency}**.	
Open the **Page1.view.xml** file with the Code Editor. Search for the **Table** with id "**tableImgClass**" we updated in previous steps. Add the following property to indicate the path to the results from SimilarItems: `items="{path : '/result'}"`	

vi. Implement the Page1.controller.js.

Explanation	Screenshot
Open the **Page1.controller.js** file. Implement the **fileUploadChange** function. This function will be called when a file has been selected.	
You can get the code from the following link: https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP	

Explanation	Screenshot

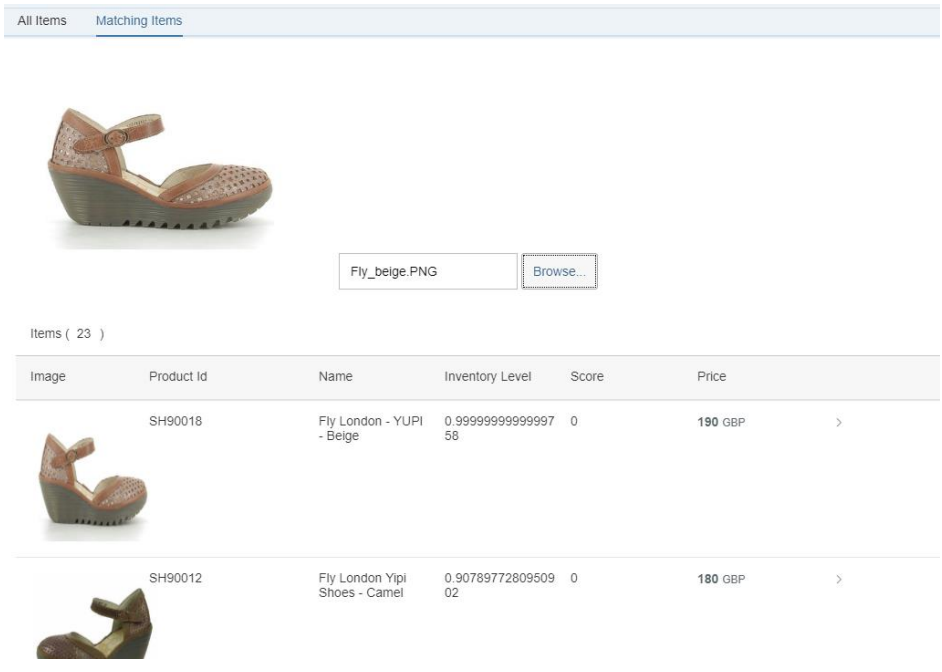
%205/Page1.controller.js_ext.txt	`// keep a reference of the uploaded file name and create a url out of that when this is an image`
	`this.srcFile = oControlEvent.getParameters().files[0];`
	`this.srcFileName = this.srcFile.name;`
	`if (this.srcFile.type.match("image.*")) {`
	`this.srcFileURL = URL.createObjectURL(this.srcFile);`
	`}`
	`},`

Now let's implement the **fileUploadComplete** function.
 	
This function will be called after the fileUploader uploadUrl ({demo>/url}) has been called and a response returned.
	`fileUploadComplete: function (oControlEvent) {`
	`// get the current view`
	`var oView = this.getView();`
	`// smbmkt backend`
	`// clear previous results from the model`
	`oView.getModel("demo").setProperty("/result", null);`
	`var processResult = function (oController, data) {`
	`oView = oController.getView();`
	`// merge with existing results - working with B1 only on this case`
	`var result = oView.getModel("demo").getProperty("/result");`
	`if (result) {`
	`result.push.apply(result, data.b1);`
	`} else {`
	`result = data.b1;`
	`}`
	`oView.getModel("demo").setProperty("/result", result);`
	`oView.getModel("demo").setProperty("/fileURL", oController.srcFileURL);`
	`// Set Model to Table`
	`var oTable = oView.byId("tableImgClass");`
	`oTable.setModel(oView.getModel("demo"));`
	`};`
	`if (oControlEvent.getParameters().status === 200) {`
	`// get the response as JSON and process the results`
	`processResult(this, JSON.parse(oControlEvent.getParameters().responseRaw));`
	`} else {`
	`MessageToast.show("Error " + oControlEvent.getParameters().status + " : " + JSON.parse(oControlEven`
	`}`
	`}`

You can get the code from the following link:
 	
https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP%205/Page1.controller.js_ext.txt
	`fileUploadComplete: function (oControlEvent) {`
	`// get the current view`
	`var oView = this.getView();`
	`// smbmkt backend`
	`// clear previous results from the model`
	`oView.getModel("demo").setProperty("/result", null);`
	`var processResult = function (oController, data) {`
	`oView = oController.getView();`
	`// merge with existing results - working with B1 only on this case`
	`var result = oView.getModel("demo").getProperty("/result");`
	`if (result) {`
	`result.push.apply(result, data.b1);`
	`} else {`
	`result = data.b1;`
	`}`
	`oView.getModel("demo").setProperty("/result", result);`

Explanation	Screenshot

	oView.getModel("demo").setProperty("/fileURL", oController.srcFileURL);
	
	// Set Model to Table
	var oTable = oView.byId("tableImgClass");
	oTable.setModel(oView.getModel("demo"));
	};
	if (oControlEvent.getParameters().status === 200) {
	// get the response as JSON and process the results
	processResult(this, JSON.parse(oControlEvent.getParameters().responseRaw));
	} else {
	MessageToast.show("Error " + oControlEvent.getParameters().status + " : " + JSON.parse(oControlEvent.getParameters().responseRaw).error_description);
	}
	}

Add the MessageToast definition at the beginning of the file. "sap/m/MessageToast", , MessageToast	sap.ui.define(["sap/ui/core/mvc/Controller", "sap/m/MessageBox", "sap/m/MessageToast", "./utilities", "sap/ui/core/routing/History"], function (BaseController, MessageBox, MessageToast, Utilities, History) { "use strict";
Now the code should be complete. Run your SAP Fiori application to check all the new features. Press Browse and choose an image containing a shoe. The SimilarItems backed API is called and similar items result shown in the table.	

Congratulations! You have just implemented your first full stack loosely coupled extension!

STEP 6: ADD A NEW SERVICE TO THE NODEJS APPLICATION

Let's add a new service to the NodeJS app that will create Sales Orders in the ERP system.

Explanation	Screenshot

Go to the smbmkt folder you deployed before in Cloud Foundry.
 	
Open the **app.js** file with a Java Script editor (Visual Studio Code is an option).
 	
Add a post service called **/SalesOrders**.
 	
This service will call a function in the biz module.
 	
You can get the code from the following link:
 	
https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP%206/app_ext.txt
	`app.post('/SalesOrders', function (req, res) {`
	`  console.log("REQUEST: Create Sales Order")`
	`  biz.CreateSalesOrder(req.body, function (response) {`
	`  res.setHeader('Content-Type', 'application/json')`
	`  res.status(201)`
	`  res.send(response)`
	`  })`
	`});`

Open the **modules/biz.js** file.
 	
Add a function called **CreateSalesOrder**.
 	
You can get the code from the following link:
 	
https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP%206/biz_ext.txt
	`function CreateSalesOrder(body, callback) {`
	`  /* Receives a body with all items from each erp */`
	
	`  var fResp = {};`
	
	`  call = 0;`
	`  for (key in body) {`
	`  var re = PostErpSalesOrder(key, body[key]).then(function (salesOrder) {`
	`  fResp[Object.keys(salesOrder)] = salesOrder[Object.keys(salesOrder)].values;`
	`  call++;`
	`  if (call == Object.keys(body).length) {`
	`  callback(fResp)`
	`  }`
	`  })`
	`  }`
	`}`

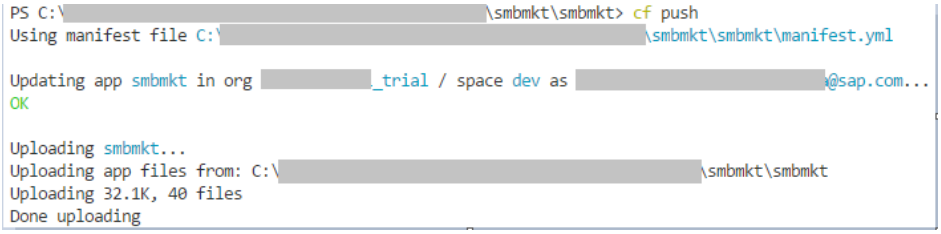
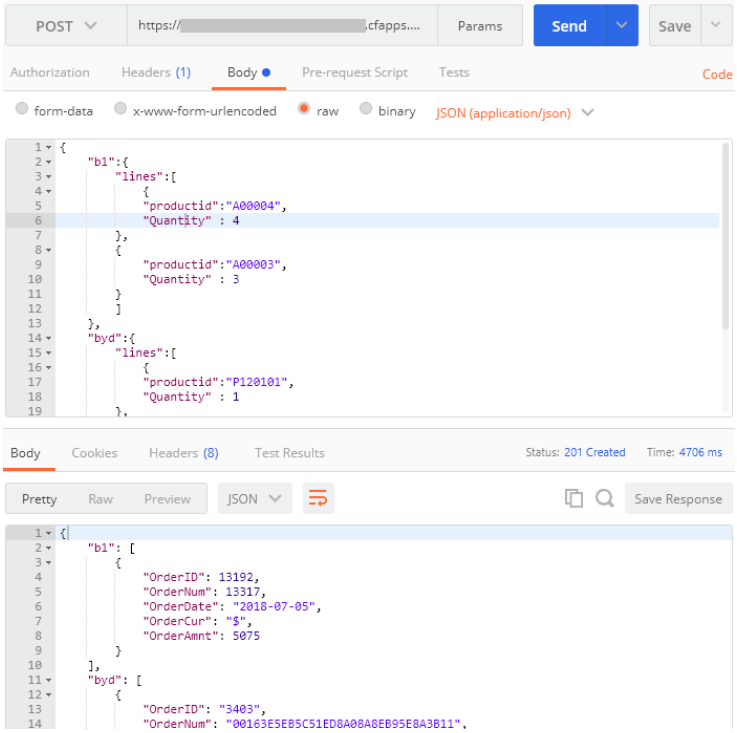
In the **modules/biz.js** file.
 	
Add a function called **PostErpSalesOrder**.
 	
This function will create a new sales order in the corresponding erp module (B1 or ByD) for each item ordered.
 	
You can get the code from the following link:
 	
https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP%206/biz_ext.txt
	`let PostErpSalesOrder = function (origin, body) {`
	`  return new Promise(function (resolve, reject) {`
	`  var erp = eval(origin);`
	
	`  erp.PostSalesOrder(body, function (error, salesOrder) {`
	`  if (error) {`
	`  salesOrder = {};`
	`  salesOrder.error = error;`
	`  }`
	`  var output = {};`
	`  if (salesOrder.hasOwnProperty("value")) {`
	`  salesOrder = salesOrder.value`
	`  }`
	
	`  output[origin] = { values: salesOrder.error || salesOrder }`
	`  resolve(normalize.SalesOrders(output))`
	`  })`
	
	`  })`
	`}`

Explanation	Screenshot

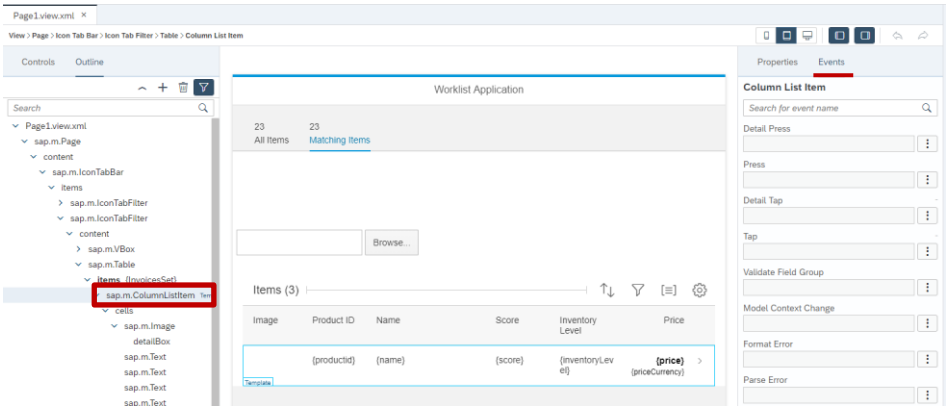
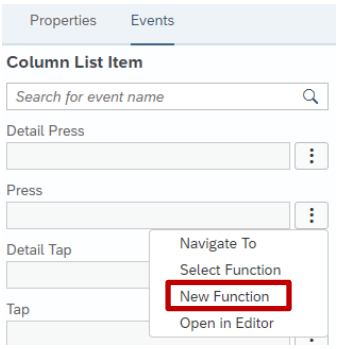
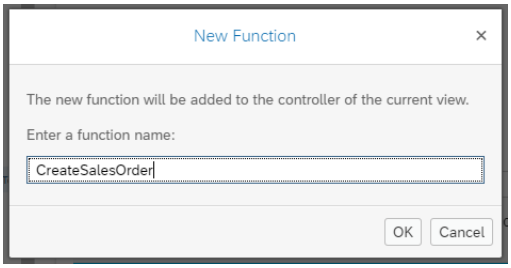
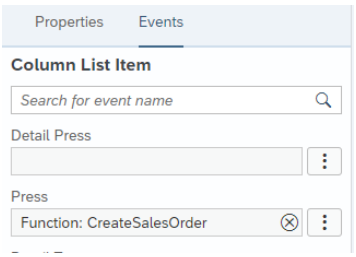
In the **modules/biz.js** file.
 	
Declare in module.exports the **CreateSalesOrder** function.
 	
You can get the code from the following link:
 	
https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP%206/biz_ext.txt
	`module.exports = {`
	`  GetItems: function (query, callback) {`
	`  return (GetItems(query, callback))`
	`  },`
	`  GetSalesOrders: function (options, callback) {`
	`  return (GetSalesOrders(options, callback))`
	`  },`
	`  SimilarItems: function (body, callback) {`
	`  return (SimilarItems(body, callback))`
	`  },`
	`  CreateSalesOrder: function (body, callback) {`
	`  return (CreateSalesOrder(body, callback))`
	`  },`

Open the **erp/b1.js** file.
 	
Add a new function **PostSalesOrder**.
 	
You can get the code from the following link:
 	
https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP%206/b1_ext.txt
	`function PostSalesOrder(body, callback) {`
	`  var options = {}`
	
	`  options.url = SLServer + "/Orders"`
	`  options.method = "POST"`
	`  options.body = {`
	`  "CardCode" : process.env.B1_DEFAULT_BP,`
	`  "DocDueDate" : moment().format('YYYY-MM-DD'),`
	`  "Comments": "Order created via SMB Mkt Place @" + moment.now(),`
	`  "DocumentLines":[]`
	`  }`
	`  options.body.DocumentLines = JSON.parse(b1Normalize(JSON.stringify(body.lines)))`
	
	`  options.body = JSON.stringify(options.body);`
	
	`  ServiceLayerRequest(options, function (error, response, body) {`
	`  if (!error && response.statusCode == 201) {`
	`  console.log("Sales order created: "+ body.DocEntry)`
	`  body = odata.formatResponse(JSON.parse(body));`
	`  callback(null, body);`
	
	`  } else {`
	`  callback(error);`
	`  }`
	`  });`
	`}`

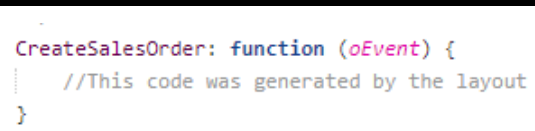
In the **erp/b1.js** file.
 	
Declare in module.exports the **PostSalesOrder** function.
 	
You can get the code from the following link:
 	
https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP%206/b1_ext.txt
	JS b1.js
	`1 /* Service Layer module to interact with B1 Data */`
	`2 /* Server Configuration and User Credentials set in environment varia`
	`3 /* Session and Node ID stored in Redis cache database */`
	`4`
	`5 var client; // Redis Client`
	`6`
	`7 module.exports = {`
	`8  GetItems: function (options, callback) {`
	`9  return (GetItems(options, callback))`
	`10  },`
	`11  GetOrders: function (options, callback) {`
	`12  return (GetOrders(options, callback))`
	`13  },`
	`14  PostSalesOrder: function (body, callback) {`
	`15  return (PostSalesOrder(body, callback))`
	`16  },`
	`17  setClient: function (inClient) { client = inClient; }`
	`18 }`

Explanation	Screenshot
Go to you cmd line window. Run the cf command `cf push` To upload the changes you did to your app to Cloud Foundry.	
You can test now your new service with Postman with the url of your app as follows: https://smbmkt-YOURAPP/SalesOrders	

STEP 7: CALL THE NEW NODEJS SERVICE FROM YOUR SAP FIORI APP

Explanation	Screenshot
Open the **Page1.view.xml** file with the Layout Editor. Open the Outline tab and select **sap.m.ColumnsListItem** control we worked on previously (second TabFilter for Matching Items). Select the **Events** tab (right side). Click on the button corresponding to the **Press** event.	
Choose the **New Function** option.	
Enter **CreateSalesOrder** as function name. Press **OK**.	
The new function will be indicated inside the Press event.	

Explanation	Screenshot

Open the **Page1.controller.js** file.
 	
A new empty function has been automatically created based on our last step.
	
	`CreateSalesOrder: function (oEvent) {`
	`  //This code was generated by the layout editor.`
	`}`

Let's implement this function to call our smbmkt backend nodejs /SalesOrder service.
 	
We use here the destination pointing to our smbmkt backend.
	
	`CreateSalesOrder: function (oEvent) {`
	`  // Get Data from ODataModel V4 /Orders`
	`  var body = {`
	`  "b1": {`
	`  "lines": [{`
	`  "productid": oEvent.getSource().getBindingContext().getObject().productid,`
	`  "Quantity": 1`
	`  }]`
	`  }`
	`  };`
	
	`  $.ajax({`
	`  url: "/smbmkt_workshopNice/SalesOrders",`
	`  type: "POST",`
	`  data: JSON.stringify(body),`
	`  contentType: "application/json",`
	`  success: function (data) {`
	`  MessageToast.show("B1 SalesOrder number " + data.b1[0].OrderNum + " created.");`
	`  },`
	`  error: function (jqXHR, textStatus, errorThrown) {`
	`  MessageToast.show("POST SalesOrders error: " + JSON.stringify(jqXHR.responseJSON));`
	`  }`
	`  });`
	`}`

You can get the code from the following link:
 	
https://github.com/B1SA/smbmkt/blob/CF_exercise/exercise/extras/STEP%207/Page1.controller.js_ext.txt
 	
Replace smbmkt_destination with your smbmkt destination name.
	`CreateSalesOrder: function (oEvent) {`
	`  // Get Data from ODataModel V4 /Orders`
	`  var body = {`
	`  "b1": {`
	`  "lines": [{`
	`  "productid": oEvent.getSource().getBindingContext().getObject().productid,`
	`  "Quantity": 1`
	`  }]`
	`  }`
	`  };`
	
	`  $.ajax({`
	`  url: "/smbmkt_destination/SalesOrders",`
	`  type: "POST",`
	`  data: JSON.stringify(body),`
	`  contentType: "application/json",`
	`  success: function (data) {`
	`  MessageToast.show("B1 SalesOrder number " + data.b1[0].OrderNum + " created.");`
	`  },`
	`  error: function (jqXHR, textStatus, errorThrown) {`
	`  MessageToast.show("POST SalesOrders error: " + JSON.stringify(jqXHR.responseJSON));`
	`  }`
	`  });`
	`}`

Congratulations! You have just implemented your first full stack loosely coupled extension!

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