JS Apps Exam – Point Of Sale Single Page Application

You are assigned to implement a **Web application** (SPA) using HTML5, JavaScript, AJAX, REST and JSON with cloud-based backend (Kinvey). The **app** that keeps **users** (cashiers), **product entires** and **receipts**. Users can **register**, **login**, **logout**, access the **main view** where a **receipt** can be **composed** (add products with their **qunatity** and **price** and save the basket to the database), list of all **receipts** and a **receipt details** view.

You are **allowed** to use libraries like **jQuery**, **Handlebars** and **Sammy**. ***Frameworks and libraries like React, Angular, Vue are not permitted!***

Problem 1. Create a Kinvey REST Service

Register at **Kinvey.com** and create an application to keep your data in the cloud.

Create a collection **entries**. Each product has **type**, **qty**, **price** and **receiptId**.

Create a collection **receipts**. Each receipt has an **active** property, initially set to **true**, **productCount** and **total**.

Problem 2. Test the Kinvey REST Services

Common Responses

Note: When creating or updating records, the response will contain the **entire record** body, as it appears in the database. It's advisable if you observe network traffic via Postman or using your browser's dev-tools, to view details about each request.

Response Code	Response Body
200 OK	***<Record data>***
201 Created	***<Record data>***
204 No Content	***<Empty>***

401 Unauthorized	`{`
	`  "error": "InvalidCredentials",`
	`  "description": "Invalid credentials. …",`
	`  "debug": ""`
	`}`

404 Not Found	`{`
	`  "error": "EntityNotFound",`
	`  "description": "This entity not found in the collection",`
	`  "debug": ""`
	`}`

Error response
409 Conflict
	`{`
	`  "error": "UserAlreadyExists",`
	`  "description": "This username is already taken. …",`
	`  "debug": ""`
	`}`

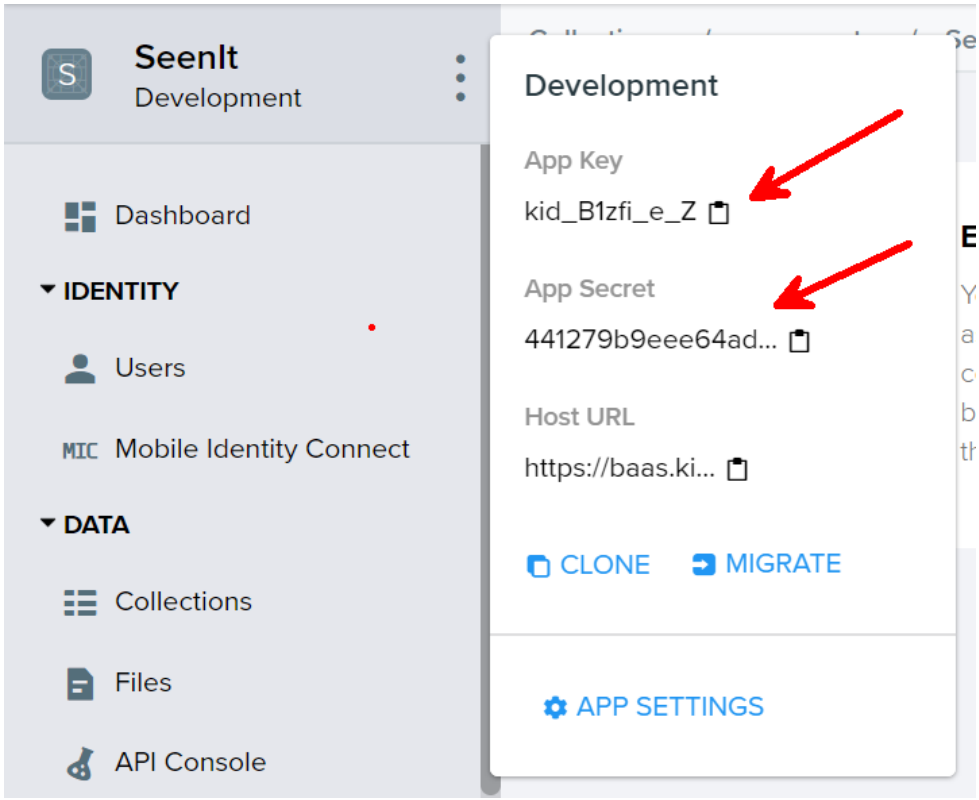
Using **Postman** or other HTTP client tool (you can use Kinvey's built-in **API Console**), test the REST service endpoints:

User Registration (Sign Up)

POST https://baas.kinvey.com/user/***app_key***/	
Request headers	Authorization: Basic base64(app_id:app_secret) Content-Type: application/json

Request body	`{`
	`  "username": "testuser",`
	`  "password": "testuserpass890"`
	`}`

The request needs "**Basic**" authentication. Use the Kinvey **App Key** and Kinvey **App Secret** as credentials.



User Login

POST https://baas.kinvey.com/user/***app_key***/login	
Request headers	Authorization: Basic base64(app_id:app_secret) Content-Type: application/json

Request body	`{`
	`  "username": "testuser",`
	`  "password": "testuserpass890"`
	`}`

Successful login returns an "**authtoken**" which is later used to authenticate the CRUD operations.

User Logout

POST https://baas.kinvey.com/user/***app_key***/_logout	
Request headers	Authorization: Kinvey **authtoken**

To logout, you need to provide the "**authtoken**" given by login / register as "**Kinvey**" authorization header.

Get Active Receipt

GET https://baas.kinvey.com/appdata/**app_key**/receipts?query={"_acl.creator":"**userId**","active":"**true**"}	
Request headers	Authorization: Kinvey authtoken

This will return the receipt that's **active** for the currently **logged in user**. Use this to populate the **Editor**, or if it's not found – create a new receipt and set it to be active.

Get Entries by Receipt ID

GET https://baas.kinvey.com/appdata/**app_key**/entries?query={"receiptId":"**receiptId**"}	
Request headers	Authorization: Kinvey authtoken

You may use this query to get all entries of the currently **active receipt**, or entries for **receipt details**.

Create Receipt

POST https://baas.kinvey.com/appdata/***app_key***/receipts	
Request headers	Authorization: Kinvey authtoken Content-Type: application/json

Request body	<pre>{
	  "active": true,
	  "productCount": 0,
	  "total": 0
	}</pre>

Add Entry

POST https://baas.kinvey.com/appdata/***app_key***/entries	
Request headers	Authorization: Kinvey authtoken Content-Type: application/json

Request body	<pre>{
	  "type": "Apple",
	  "qty": 5,
	  "price": 0.3,
	  "receiptId": "59affdae3044bb86044a79bd"
	}</pre>

New entries should always be added to the **active receipt**.

Delete Entry

DELETE https://baas.kinvey.com/appdata/***app_key***/entries/***entry_id***	
Request headers	Authorization: Kinvey authtoken

Get My Receipts

GET https://baas.kinvey.com/appdata/**app_key**/receipts?query={"_acl.creator":"**userId**","active":"**false**"}	
Request headers	Authorization: Kinvey authtoken

Use the ID of the currently **logged in user**. ***The user should see only his or her receipts on the overview screen.***

Receipt Details

GET https://baas.kinvey.com/appdata/**app_key**/receipts/**receipt_id**	
Request headers	Authorization: Kinvey authtoken

Commit Receipt

PUT https://baas.kinvey.com/appdata/**app_key**/receipts/**receipt_id**	
Request headers	Authorization: Kinvey authtoken Content-Type: application/json

Request body	`{`
	`  "active": false,`
	`  "productCount": 0,  // Sum of all products`
	`  "total": 0,  // Total cost of all products`
	`  // Other receipt properties`
	`}`

To mark a receipt as finalized (client has checked out), simply update it to set its **active** property to **false**. You need to send the whole receipt object, so don't forget to fetch the receipt from the database first.

Problem 3. HTML and CSS

You are given the Web design of the application as **HTML** + **CSS** files.

- Initially all views and forms are shown by the HTML. Your application may **hide** by CSS (display: none) or **delete** from the DOM all unneeded elements or just display the views it needs to display.
- You may render the views / forms / components with **jQuery** or **Handlebars**.

Important: don't change the elements' **class name** and **id**. Don't rename form fields / link names / ids. You are **allowed** to add **data attributes** to any elements. You may modify **href attributes** of links and add **action/method attributes** to forms, to allow the use of a routing library.

Including the <section> elements is required for the style to display correctly!

Problem 4. Client-Side Web Application

Design and **implement** a client-side front-end app (SPA). Implement the functionality described below.

Notifications (10 pts)

The application should notify the users about the result of their actions.

- In case of successful action an **informational (green) notification message** should be shown, which disappears automatically after 3 seconds or manually when the user clicks it.

- In case of **error**, an **error notification message (red)** should be shown which disappears on user click.

- During the AJAX calls a **loading notification message (blue)** should be shown. It should disappear automatically as soon as the AJAX call is completed.

Points for notifications are awarded separately for each section.

Navigation System (10 pts)

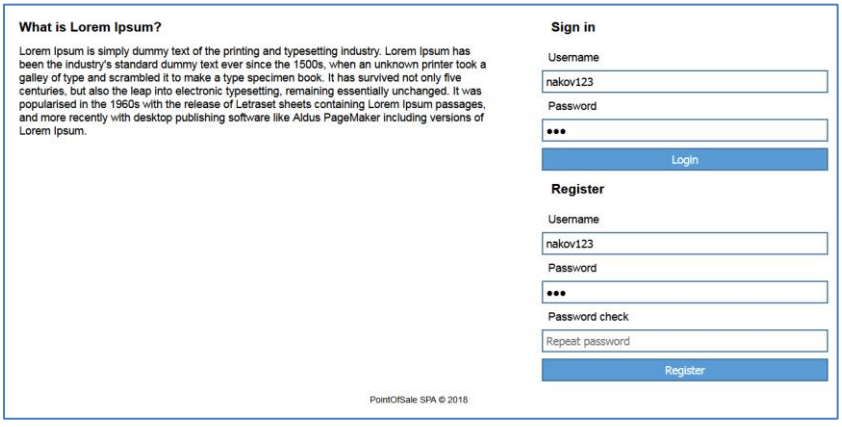
Implement a **navigation system** for the app: navigation links should correctly change the current screen (view).

- Clicking on the links in the **menu** or **individual** links should display the view behind the link (views are sections in the HTML code).
- The given „**Navigation**“ menu should be visible **only** for logged in users. Anonymous users can **only** view the **sign in/register** section.

Register User Screen (5 pts)

By given **username**, **password and repeat password** the app should register a new user in the system.

- After a **successful registration**, a notification message “User registration successful.” should be displayed and the user should be **redirected** to the home view.
- You **need** to validate the **input**. A username **should** be a string with at **least** 5 characters **long**. Passwords **input** fields shouldn’t be **empty**. Both passwords **should** match.
- In case of **error** (eg. invalid username/password), an appropriate error **message** should be displayed and the user should be able to **try** to register again.
- Keep the user session data in the browser’s **session storage**.
- Clear **all** input fields after **successful** register.



Login User Screen (5 pts)

By given **username** and **password** the app should be able to login an existing user.

- After a **successful login**, a notification message "Login successful." should be displayed and and the user should be **redirected** to the home view.
- In case of **error**, an appropriate error message should be displayed and the user should be able to fill the login form again.
- **Form validation** should be the **same** as register.
- Keep the user session data in the browser's **session storage**.
- Clear **all** input fields after **successful** login.

Logout (5 pts)

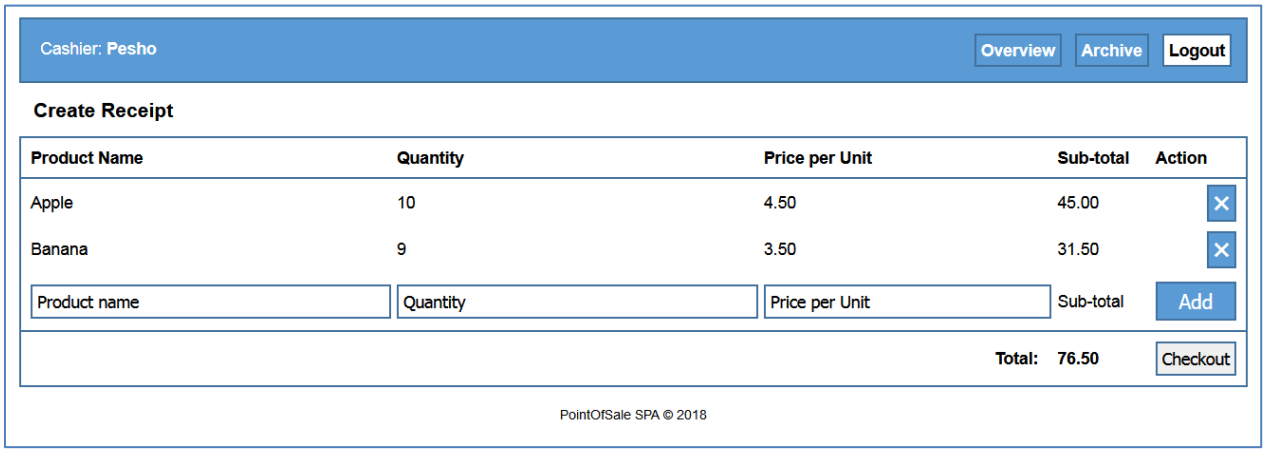
Successfully logged in user should be able to **logout** from the app.

- After a **successful** logout, a **notification** message "Logout successful." should be displayed.
- After successful logout, the **Sign In screen** should be shown.
- The **"logout" REST service** at the back-end should be obligatory called at logout.
- All local information in the browser (**user session data**) about the current user should be deleted.

Home Screen (Receipt Editor) (45 pts)

Display Currently Active Receipt (15 pts)

Whenever the user opens the editor, you should retrieve the currently **active receipt** and all products related to it (by **receiptId**). If there is no active receipt, you must create it in the database. Note that the HTML contains **hidden input fields**, which you can use. ***There must be only one active receipt at any one time on the server!***



Add New Entry (10pts)

Clicking on Add creates a new entry, using the receipt ID of the currently active receipt and the data from the input fields. The fields must be validated:

- Product **name** must be a **non-empty string**
- **Quantity** must be a **number**
- **Price** must be a **number**

Update the value of **Sub-total** and **Total** in real time, whenever the user changes Quantity or Price to a valid value. Upon successfully adding the entry to the database

After successful entry creation, display a notification "Entry added", **add the information** to the end of the list of entries and **clear all input values**.

Update Sub-total and Total (5 pts)

When the user enters a **valid value** for **Quantity** and **Price per Unit**, the displayed values for **Sub-total** for the new entry and **Total** for the receipt should be updated.

Remove Entry (5 pts)

Clicking the **delete button** next to each entry must **remove it** from the database and **delete the row** from the table. After successful deletion, **update** the value of Total. Display a notification "Entry removed" and **remove the corresponding elements** from the list of entries.

Checkout Receipt (10 pts)

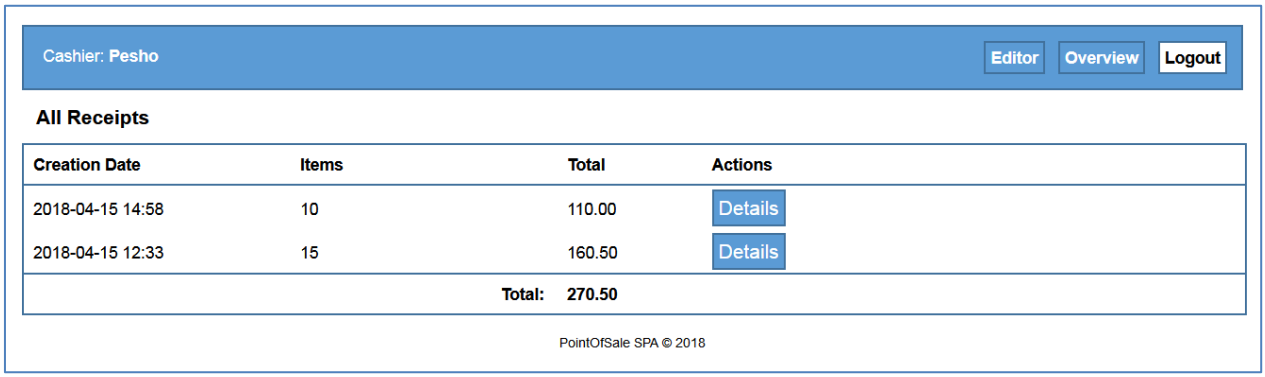
Clicking on **Checkout** should perform the following:

- Display a **notification** "Receipt checked out"
- Update the receipt in the database to have its **active** property set to **false** and the properties **productCount** and **total** populated with the correct values
- Prepare the editor for a **new receipt** by creating it in the database and **clearing the screen** of any old information.

Before carrying out any actions, make sure the receipt contains **at least one entry** – ***the user should not be able to checkout an empty receipt!***

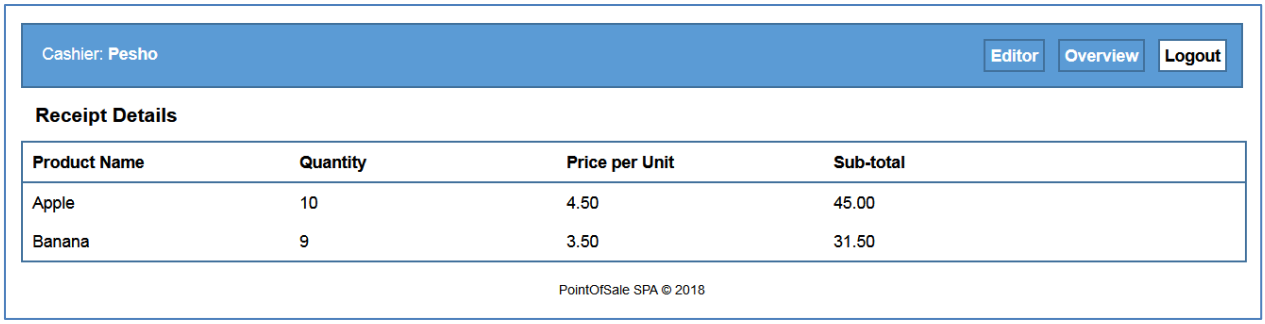
All Receipts (10 pts)

Display a list of all receipts that the user has created. Use the stored user ID to retrieve only the relevant records. Every receipt must have a **link** that leads to its **details**. ***The user should see only his or her receipts.***



Receipt Details (10 pts)

Display the selected receipt with a list of all entries in it. Use the receipt ID to filter only the related entries.



Problem 5. Subtmitting Your Solution

Place in a ZIP file your project folder. Exclude the **`node_modules`** folder. Upload the archive to the Judge.