

## **CMPE 273: Enterprise Distributed Systems**

### **Lab 2 Assignment: Using REST (Node.js) and React JS**

This lab covers designing and implementing distributed service-oriented applications using Kafka. This lab will grade for 35 points and is an individual effort (no teamwork allowed)

#### **Prerequisite**

- You need to have prior knowledge of JavaScript, React, Redux, MongoDB, Passport, JWT token, AWS EC2 and Kafka

#### **Grading**

Etsy Application - 30 marks

Questions – 5 marks

Total – 35 marks

*Note: Late assignments will be accepted but will be subject to a penalty of -5 points per day late. Submissions received at or before the class on the due date can receive a maximum.*

# Etsy

You need to develop a “Prototype of **Etsy** application”. This prototype will be a web application using React and Node. Refer to the **Etsy** website and see how it functions.

You need to implement the following features in your application.

1. Signup (name, email id, password)
2. log in
3. log out

A **User** should be able to do the following functionalities:

## **Profile Page/ Favorites Page- Basic:**

1. The “Favorite Items” section should be displayed as in Etsy.
2. Edit button should take the user to update the profile page.
3. Users should be able to perform a name search on their favourite items.

The screenshot shows a user profile on the Etsy website. At the top, there's a navigation bar with categories like Valentine's Day Gifts, Jewelry & Accessories, Clothing & Shoes, Home & Living, Wedding & Party, Toys & Entertainment, Art & Collectibles, Craft Supplies, and Gifts & Gift Cards. Below the navigation is a search bar with the word "Etsy" and a placeholder "Search for anything". To the right of the search bar are icons for heart, notifications, user profile, and shopping cart. The main content area starts with a user's profile picture and name "USER NAME". It shows "0 Following" and "0 Followers". Below this, there's a section titled "Favorite items" with a "Public" link and edit/upload buttons. A product card for a "Solar powered hanging Lantern" is displayed, showing a price of \$23.99 and free shipping. A search bar at the bottom right says "Search your favorites" with a "Filters" button.

## **Profile Page - Update:**

1. Display complete profile of a customer (basic details, about, profile picture)
2. Upload profile picture
3. Update basic details (name, date of birth, city)
4. Update Contact Information (email id, phone number)
5. Full address ( mandatory )
6. **The country** should be a dropdown with the list of countries to select from and should not be entered manually.

The screenshot shows the 'Your Public Profile' section of the Etsy website. At the top, there's a search bar and navigation links for Valentine's Day Gifts, Jewelry & Accessories, Clothing & Shoes, Home & Living, Wedding & Party, Toys & Entertainment, Art & Collectibles, Craft Supplies, and Gifts & Gift Cards. A 'View Profile' button is also present. The main form area has sections for 'Profile Picture' (with a placeholder image and a 'Choose File' button), 'Name' (with 'Your Name' and 'USER NAME' fields and a 'Change or remove' link), 'Gender' (with radio buttons for Female, Male, Rather not say, and Custom), 'City' (with a text input field and a note to start typing a suggested city), 'Birthday' (with dropdown menus for month and day), and 'About' (with a text input field and a note to tell people about yourself). A 'Save Changes' button is at the bottom.

## **Sell on Etsy Page - First time:**

1. Collect name of the shop which must be unique and its availability can be checked by the button beside it.

### Name your shop

Choose a memorable name that reflects your style.

ShopBy273

✓ Available

Check availability

Your shop name will appear in your shop and next to each of your listings throughout Etsy. After you open your shop, you can change your name once. [Here are some tips for picking a shop name.](#)

Once the shop is named, the user should be redirected to the shop home page,

## **Shop Home Page:**

It consists of the following details,

1. Shop name
2. Shop image
3. Shop owner details
4. List of all the items in the shop along with their sales count.
5. Only for Owner:
  - a. Edit shop image option
  - b. Add a new item and edit an already existing item [in a popup window]
  - c. Display total sales of all the items in that particular shop

The screenshot shows the homepage of a shop named 'SunnySelfCare'. At the top, there's a placeholder image of a storefront, the shop name 'SunnySelfCare', and stats '0 Sales | On Etsy since 2020'. Below this are buttons for 'Edit shop' and 'Favorite shop (0)'. To the right, it says 'SHOP OWNER' with a profile picture of 'Mary' and a 'Contact' button. The main section is titled 'Items' with a search bar. It shows one item: 'Healthy Habit Tracker' (Thumbnail: A grid), listed as 'Healthy Habits' with 1 item. Below the item is a 'Contact shop owner' button. At the bottom, it shows '0 Sales' and '0 Admirers'. On the far right, there's a 'Sort: Most Recent' dropdown.

## **Adding and editing an item to a shop:**

- Should open a pop-up window that will accept the below details
  - a. Name of the item
  - b. Photo
  - c. Category (Clothing, Jewellery, Entertainment, Home Decor, Art)
    - i. An owner should be able to create a new category if required.
  - d. Description
  - e. Price
  - f. Quantity available
    - i. Show "out of stock" if users try to order more than the available quantity.
- Edit should allow the user to modify existing details for an item.
  - Once an item is edited, past orders should stay intact.

## Dashboard – Landing page:

1. Navbar consisting
  - a. Logo
  - b. Search Bar
  - c. Favourites Page navigation
  - d. User Profile
  - e. Cart
2. List the shopping items that have been posted by other users. Must include a name, image of the item, favourite button and price.
3. Users should be able to click on an item and be redirected to the **shopping item overview page**.

The screenshot shows the Etsy homepage. At the top, there's a search bar with 'Search for anything' and a magnifying glass icon. Below the search bar are several category links: Valentine's Day Gifts, Jewelry & Accessories, Clothing & Shoes, Home & Living, Wedding & Party, Toys & Entertainment, Art & Collectibles, Craft Supplies, and Gifts & Gift Cards. A shopping cart icon with a '2' is also visible. The main content area features a 'Welcome back, ABC!' message. Below it, there are sections for 'Your recent activity' and 'Recently favorited and viewed items', each displaying five thumbnail images of products like a calendar, a light-up sign, and a gown. Further down, there's a grid of five items from sellers named 'tyler the creator': a beanie, a gift, a digital download, a necklace, and a sweatshirt. At the bottom, there are four more product thumbnails.

4. The footer shows the country and currency. Currency should be editable (dropdown with various currency types).

The screenshot shows the bottom of the Etsy page with a dark blue footer bar. On the left, there's a United States flag icon followed by the text 'United States | English (US) | \$ (USD)'. On the right, there are links for '© 2022 Etsy, Inc.' and 'Terms of Use', 'Privacy', and 'Interest-based ads'.

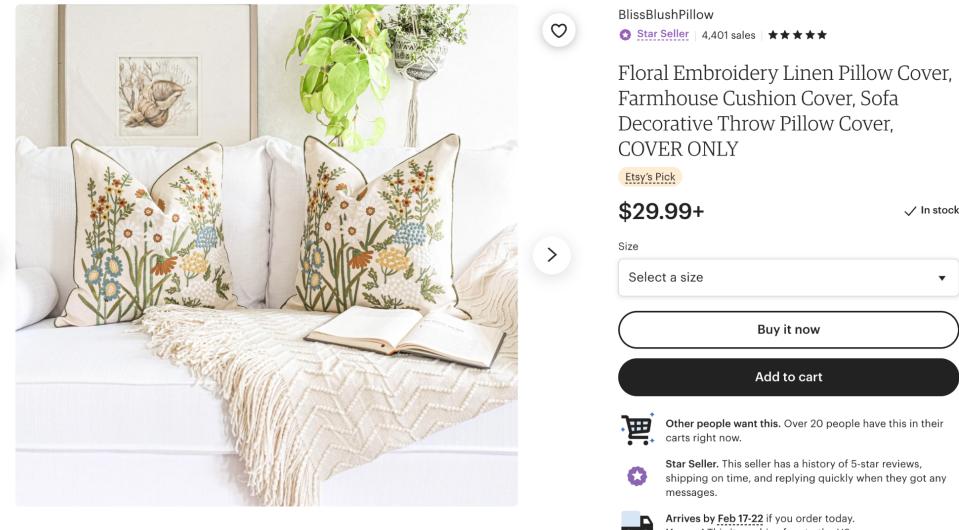
## Searching Landing Page:

1. Items can be searched by item name using the search bar in the navbar.
2. Once clicked on the search button, search results should be displayed.
3. Each search result should have the image of the item, the name of the item, and the price
4. The items should be filterable by price range.
5. The items should be sortable by price, quantity, sales count.
6. Check box to exclude out of stock items.

The screenshot shows the Etsy search results for 'boho prints set'. The search bar at the top contains the query 'boho prints set'. Below the search bar, there are several navigation links: Valentine's Day Gifts, Jewelry & Accessories, Clothing & Shoes, Home & Living, Wedding & Party, Toys & Entertainment, Art & Collectibles, Craft Supplies, and Gifts & Gift Cards. There are also icons for a heart, a bell, and a shopping cart with a notification badge. Below the navigation, there are five small circular preview images of different 'boho prints set' products. Underneath these are four main product cards displayed in a grid. Each card includes an image, the product name, a star rating, the number of reviews, the price, and a brief description. The first card is 'Wall Art Set of 5, Abstract Boho Art Set of 5 Prints', the second is 'Set of 3 Cowboy Prints | Boho Western Prints', the third is 'Gallery Wall Set Of 6, Sun Print, Boho Wall Art', and the fourth is 'Set of 6 Prints, Sage Green Print Set, Boho Bot...'. Each card also has a 'More like this' link at the bottom right.

## Shopping Item Overview page:

1. Should consist of an image of the item, add the item to the favorites option, shop name (hyperlinked to the shop home page), sales count, name of the item, price, description, select quantity, and option to add to the cart.



### Cart Page:

1. Shows the list of all the items added to the cart.
2. Must display the name, quantity, price of the item.
3. Items from multiple shops can be added to the cart at the same time.
4. Display appropriate total price while checking out.
5. After clicking proceed to checkout, the order must be placed and you should be redirected to the “My Purchases” page.
6. Each order that is successfully placed should have an auto-generated order id for future references.
7. Users should be able to add the gift packing option (checkbox and description) for each product in the cart before placing the order and it should reflect in the My purchases page as well.
8. Users should be able to edit the quantity in this screen i.e., remove items, modify the quantity.

### My Purchases page:

1. My purchases page must consist of a list of all the purchases made by the user. Must include an image of the item, name, shop name, quantity, price, date of purchase.
2. Paginate the above My Purchases page and allow users to select page sizes of 2, 5 or 10 from a dropdown. The default page size selected in the dropdown should be 5.

**Notes:**

1. An item can be added and removed from favourites.
  2. The selected currency must be shown all over the application.
  3. Before placing an order or creating a shop, the user must add a full address to the profile.
  4. Every service should have proper exception handling and every input field should have proper validation.
  5. Password values should be encrypted.
  6. All images are just for reference. Please follow the instructions written.
  7. When the currency is changed, the conversion factor for prices and totals can be ignored.
  8. After an item is ordered, the available quantity for that item should change accordingly.
  9. Passport.js and JWT Tokens should be used for authentication.
  10. MongoDB with connection pooling should be used.
  11. Redux should be implemented in all the components.
  12. Use any cloud platform to store uploaded images.
- ESLint should be used in your code following the Airbnb style guide.
  - The application should be deployed on the cloud (E.g. Heroku, AWS EC2)
  - A simple, attractive, and responsive client attracts good marks.

# Testing

1. Testing of the backend server should be done using JMeter and Mocha.
2. The React testing library should be used to test at least 3 views/pages.

Following tasks to be tested using JMeter:

Test the server for **100, 200, 300, 400, and 500 concurrent users** with and without connection pooling. Draw the graph with the average time and include it in the report.

Following tasks to be tested using Mocha:

Implement five randomly selected REST web service API calls using Mocha. Display the output in the report.

## Questions

Please find the questions for Lab2 which you have to answer in your lab report

1. Compare the passport authentication process with the authentication process used in Lab1.
2. Compare performance with and without Kafka. Explain in detail the reason for the difference in performance.
3. If given an option to implement MySQL and MongoDB both in your application, specify which part of data of the application you will store in MongoDB and MySQL respectively

## Git Repository

- In your Git repository, create two sub-folders, one for Frontend and one for Backend. Place all your source code in respective Folders.
- Add a proper description for every commit describing what code changes are added.
- Regular commits to your repository are mandatory. (Penalty of 3 marks if missed).
- Do not submit dependencies or supporting libraries (e.g. node\_modules) (including them causes deduction of 2 marks).
- All the dependencies should be included in the package.json file.
- The Readme file of your repository should contain the steps to run the application.

## Project Report

- Introduction: State your goals and purpose of the system
- System Design: Describe your chosen system design
- Results: Screen captures of testing results and important screens of the application.
- Performance: What was the performance? Analyze results and explain why you are getting those results.
- Git Commit history – screen capture
- Answers to the questions.

## Submission

Please upload your report (John\_Lab2\_Report.doc) on Canvas before the deadline.  
(Number of pages in Report should be below 30)