

The following exercises are intended to help us get a feel for your coding habits and strategies. You may search online and find solutions to the below. For each of the questions below, check-in your code to Github (where relevant) and share the link with us before the interview.

Please note that there 3 Exercises in total. There may be some pages intentionally left blank, you are requested to scroll down until the last page to find all the three problem statements.

Exercise 1

1. Develop a REST API for representing Meta-Data with end points (GET, POST, PUT ,DELETE etc.). For example GET on /api/v1/location returns all location objects.
 - /api/v1/location, /api/v1/location/{location_id}/department
 - /api/v1/location/{location_id}/department/{department_id}/category
 - /api/v1/location/{location_id}/department/{department_id}/category/{category_id}/subcategory
 - /api/v1/location/{location_id}/department/{department_id}/category/{category_id}/subcategory/{subcategory_id}
2. Persist the data in your favorite db. - relational or non-relational (You are expected to install, configure, populate the db).
3. You may feel free to qualify object representations with additional attributes to enhance modeling (For e.g. Location object attributes = locationid, location description)
4. In your chosen web front-end framework, develop a web-based UI, that the user can interact with and perform CRUD (create, read, update, delete) operations on the data (The calls should go through API layer built in step 1).
5. Let's say you get the above "Data" that contains SKU's and its meta-data. Write a program/api end point that takes input meta-data and returns all the SKU rows in the "Data" that matches with the input meta-data. For example, for input meta-data (Perimeter, Bakery, Bakery Bread, Bagels) , return the rows with SKUs 1 & 14 (The actual data given to you might contain more rows)

Hierarchical Metadata

Location,Department,Category,SubCategory

Perimeter,Bakery,Bakery Bread,Bagels

Perimeter,Bakery,Bakery Bread,Baking or Breeding Products

Perimeter,Bakery,Bakery Bread,English Muffins or Biscuits

Perimeter,Bakery,Bakery Bread,Flatbreads

Perimeter,Bakery,In Store Bakery,Breakfast Cake or Sweet Roll

Perimeter,Bakery,In Store Bakery,Cakes

Perimeter,Bakery,In Store Bakery,Pies
Perimeter,Bakery,In Store Bakery,Seasonal
Center,Dairy,Cheese,Cheese Sauce
Center,Dairy,Cheese,Specialty Cheese
Center,Dairy,Cream or Creamer,Dairy Alternative Creamer
Center,Dairy,Cream or Creamer,Whipping Creams
Center,Dairy,Cultured,Cottage Cheese
Center,Dairy,Refrigerated Baking,Refrigerated Breads
Center,Dairy,Refrigerated Baking,Refrigerated English Muffins and Biscuits
Center,Dairy,Refrigerated Baking,Refrigerated Hand Held Sweets
Center,Dairy,Refrigerated Baking,Refrigerated Pie Crust
Center,Dairy,Refrigerated Baking,Refrigerated Sweet Breakfast Baked Goods
Perimeter,Deli and Foodservice,Self Service Deli Cold,Beverages
Perimeter,Deli and Foodservice,Service Deli,Cheese All Other
Perimeter,Deli and Foodservice,Service Deli,Cheese American
Perimeter,Floral,Bouquets and Cut Flowers,Bouquets and Cut Flowers
Perimeter,Floral,Gifts,Gifts Perimeter,Floral,Plants,Plants
Center,Frozen,Frozen Bake,Bread or Dough Products Frozen
Center,Frozen,Frozen Bake,Breakfast Cake or Sweet Roll Frozen
Center,Frozen,Frozen Breakfast,Frozen Breakfast Entrees
Center,Frozen,Frozen Breakfast,Frozen Breakfast Sandwich
Center,Frozen,Frozen Breakfast,Frozen Egg Substitutes
Center,Frozen,Frozen Breakfast,Frozen Syrup Carriers
Center,Frozen,Frozen Desserts or Fruit and Toppings,Pies Frozen
Center,Frozen,Frozen Juice,Frozen Apple Juice
Center,Frozen,Frozen Juice,Frozen Fruit Drink Mixers
Center,Frozen,Frozen Juice,Frozen Fruit Juice All Other
Center,GM,Audio Video,Audio Center,GM,Audio Video,Video DVD
Center,GM,Audio Video,Video VHS Center,GM,Housewares,Bedding

Center,GM,Housewares,Candles Center,GM,Housewares,Collectibles and Gifts
Center,GM,Housewares,Flashlights Center,GM,Housewares,Frames
Center,GM,Insect and Rodent,Indoor Repellants or Traps
Center,GM,Insect and Rodent,Outdoor Repellants or Traps
Center,GM,Kitchen Accessories,Kitchen Accessories
Center,GM,Laundry,Bleach Liquid
Center,GM,Laundry,Bleach Powder
Center,GM,Laundry,Fabric Softener Liquid
Center,GM,Laundry,Fabric Softener Sheets
Center,Grocery,Baking Ingredients,Dry or Canned Milk
Center,Grocery,Baking Ingredients,Food Coloring
Center,Grocery,Spices,Salt Cooking or Edible or Seasoned
Center,Grocery,Spices,Salt Substitute
Center,Grocery,Spices,Seasoning Dry
Center,Grocery,Stuffing Products,Stuffing Products
Perimeter,Seafood,Frozen Shellfish,Frozen Shellfish
Perimeter,Seafood,Other Seafood,All Other Seafood
Perimeter,Seafood,Other Seafood,Prepared Seafood Entrees
Perimeter,Seafood,Other Seafood,Seafood Salads
Perimeter,Seafood,Other Seafood,Smoked Fish
Perimeter,Seafood,Other Seafood,Seafood Breeding Sauces Dips

Sample Data Set

SKU,NAME,LOCATION,DEPARTMENT,CATEGORY,SUBCATEGORY
1,SKUDESC1,Perimeter,Bakery,Bakery Bread,Bagels
2,SKUDESC2,Perimeter,Deli and Foodservice,Self Service Deli Cold,Beverages
3,SKUDESC3,Perimeter,Floral,Bouquets and Cut Flowers,Bouquets and Cut Flowers
4,SKUDESC4,Perimeter,Deli and Foodservice,Service Deli,All Other
5,SKUDESC5,Center,Frozen,Frozen Bake,Bread or Dough Products Frozen

6,SKUDESC6,Center,Grocery,Crackers,Rice Cakes
7,SKUDESC7,Center,GM,Audio Video,Audio
8,SKUDESC8,Center,GM,Audio Video,Video DVD
9,SKUDESC9,Permiter,GM,Housewares,Beeding
10,SKUDESC10,Permiter,Seafood,Frozen Shellfish,Frozen Shellfish
11,SKUDESC11,Permiter,Seafood,Other Seafood,All Other Seafood
12,SKUDESC12,Permiter,Seafood,Other Seafood,Prepared Seafood Entrees
13,SKUDESC13,Permiter,Seafood,Other Seafood,Salads
14,SKUDESC14,Permiter,Bakery,Bakery Bread,Bagels
15,SKUDESC15,Permiter,Deli and Foodservice,Self Service Deli Cold,Beverages
16,SKUDESC16,Permiter,Floral,Bouquets and Cut Flowers,Bouquets and Cut Flowers
17,SKUDESC17,Permiter,Deli and Foodservice,Service Deli,All Other
18,SKUDESC18,Center,Frozen,Frozen Bake,Bread or Dough Products Frozen

Exercise 2

1. Demonstrate test-driven development practices through code written in Exercise1 i.e. unit/component/integration/acceptance tests that can be run for a change in source code
2. Build and Deploy your application outside of your IDE with automated scripts (Imagine someone who has access to source code and has to build and deploy your application without talking to you - and doesn't have all the customized settings of your IDE). If you cannot write automated script, demonstrate the steps you would take , show us manually how you would deploy.

Exercise 3

1. Once the app (front-end, API/middle tier, back-end) that you built in Exercise1 and Exercise2 is running, implement a logging framework and make changes to the source code above.
2. Implement an authentication mechanism for the UI (username/password) and API (Basic Auth) - Bonus points if you can demonstrate OpenIDConnect, JWT, OAuth2
3. How would you check the HEALTH of the application by being proactive than reactive ? Feel free to use monitoring tools/frameworks available out-of-box (you are expected to set them up yourself)