BTI225 Assignment 2

# Submission Deadline:

Friday, February 15th, 2019 @ 23:59

# Assessment Weight:

5% of your final course Grade

# Objective:

Practice String, Array Operations, Custom Objects & Working with Data.

# Specification:

Write a custom object called customerDB that will serve as an object "database" for a strictly formatted set of sample data. Start with the provided file (***a2.js*)**.

This file includes two blocks of code (you will write your customerDB object between them):

* The block labeled **TEST DATA** at the bottom is currently commented out, but you must uncomment it gradually to test your solution step by step. After running your code with the TEST Data uncommented, the output in the console should look like the sample file (***A2-TEST-DATA-Output.pdf***).
* The second block of code at the top of the file (labeled **ALL DATA**) is an array of objects called "allData". All the objects in this array follow the same format:

{ type: "customer" */\* or "store" or "address"\*/*, data: { */\* object with properties related to the "type" \*/* }

The "**type**" is one of "**customer**", "**store**", or "**address**", and the "**data**" is an object with properties that belong to the "store" or "customer" or "address". The properties in the "**data**" object will always have the same names and follow the following convention for each of the following "types":

|  |  |
| --- | --- |
| **type: "customer"** | |
| **customer\_id** | A primary key used to uniquely identify each customer. |
| **store\_id** | A foreign key identifying the customer's "home store." |
| **first\_name** | The customer's first name. |
| **last\_name** | The customer's last name. |
| **email** | The customer's email address. |
| **address\_id** | A foreign key identifying the address of the customer. |
| **add\_date** | The date the customer was added to the system. |

|  |  |
| --- | --- |
| **type: "store"** | |
| **store\_id** | A primary key that uniquely identifies the store. |
| **address\_id** | A foreign key identifying the address of the store |
| **name** | The name of the store / branch. |

|  |  |
| --- | --- |
| **type: "address"** | |
| **address\_id** | A primary key used to uniquely identify each address. |
| **address** | The street address. |
| **city** | The name of the city |
| **province** | The name of the province |
| **postal\_code** | The postal code or ZIP code of the address (where applicable). |

## **Part A: CustomerDB Object [3 marks]**

In your ***a2.js*** file, underneath the "allData" array, declare an object called **CustomerDB** using "Object Literal Notation". This object will **contain** the following **properties** & **methods**

## **Properties:**

The following are internal arrays that will serve as the primary storage mechanism within the CustomerDB object for all of our sample data

1. **customers:**This is an array that will contain all the sample data objects that are of **type "customer".** It is initialized as an empty array ( ie, [] ) and will be manipulated using the methods in the CustomerDB Object
2. **addresses:**This is an array that will contain all the sample data objects that are of **type "address".** It is initialized as an empty array ( ie, [] ) and will be manipulated using the methods in the CustomerDB Object
3. **stores:**This is an array that will contain all the sample data objects that are of **type "store".** It is initialized as an empty array ( ie, [] ) and will be manipulated using the methods in the CustomerDB Object

**Methods (functions):** there are 13 methods (functions) associated with the object **CustomerDB**. Please label the number in comment for each function implementation (easy to check). e.g.,

## // 1) insertData(allData)

You can add more regular functions (not associated with the object).

## **insertData(allData) [4 marks]**

## It is the first method that will be invoked on your CustomerDB object. It is this method that takes all of the sample data (“allData” array) and inserts it into the correct arrays (ie: "customers", "addresses", or "stores"). It takes one parameter, the “allData” array from the top of your **a2.js** file and processes it one array element at a time using the following rules:

* if type is "store", insert the "data" object into the "stores" array

(**HINT**: there is a function we will write called **addStore(storeObj)** that will be perfect for this)

* if type is "customer", retrieve the "data" object and set it's "add\_date" property to the current date and add it into the "customer" array

(**HINT**: there is a function we will write called **addCustomer(customerObj)** that will be perfect for this)

* if type is "address", insert the "data" object into the "addresses" array

(**HINT**: there is a function we will write called **addAddress(addressObj)** that will be perfect for this)

Once this method has run, and your "database" is built. The result will be:

* "customers" array should contain **8** "customer" data objects,
* "addresses" array should contain **9** "address" data objects,
* "stores" array should contain **3** "store" data objects

## **Methods to work with "customer" data**

The following are methods that deal primarily with the "customers" array. Any output for these functions is meant for the web console, so whenever the term "output" is used, you may assume that we're outputting to the console with console.log().

HINT: to refer to the "customers" array from within these methods, use the "this" keyword, ie: "this.customers".

1. **addCustomer ( customerObj ) [1 mark]**

This method takes an object of type "customer", sets its "add\_date" property to the current date and adds it to the "customers" array.

1. **outputCustomerById( customer\_id ) [5 marks]**

This method takes a number representing a customer\_id and outputs all of the customer data for the corresponding customer\_id from the "customers" array (including their address from the "addresses" array (**HINT**: there is a function we will write called **getAddressById(address\_id)** that will be perfect for this), in the format:

Customer ***customer\_id***: ***first\_name*** ***last\_name*** ( ***email*** )  
Home Address: ***address city***, ***province***. ***postal\_code***Joined: ***add\_date***

For Example, **CustomerDB.outputCustomerById(26)**:

Customer 26: Dave Bennett (dbennett@gmail.com)  
Home Address: 3945 John St. Ajax, ON. L7M4T9  
Joined: Wed Feb 01 2017 22:13:22 GMT-0500 (EST)

1. **outputAllCustomers( ) [3 marks]**

This method takes no parameters and simply outputs all customers in the **same format as above**, including a header at the top of the output stating "All Customers", ie:

All Customers

Customer 26: Dave Bennett (dbennett@gmail.com)

Home Address: 3945 John St. Ajax, ON. L7M4T9

Joined: Wed Feb 01 2017 22:13:22 GMT-0500 (EST)

Customer 59: John Stevens (jstevens22@hotmail.com)

Home Address: 391 Baker St. Apt 231 Mississauga, ON. M4T8S3

Joined: Wed Feb 01 2017 22:13:22 GMT-0500 (EST)

*…etc…*

1. **outputCustomersByStore ( store\_id ) [5 marks]**

This method takes a number representing a store\_id and outputs all of the customer data for the corresponding store\_id from the "customers" array in the **same format as above**, including a header at the top of the output in the format: Customers in Store ***name***

For Example, **CustomerDB.outputCustomersByStore(297);**

Customers in Store: Scotiabank - Main Branch

Customer 26: Dave Bennett (dbennett@gmail.com)

Home Address: 3945 John St. Ajax, ON. L7M4T9

Joined: Wed Feb 01 2017 22:29:06 GMT-0500 (EST)

Customer 63: Steven Edwards (steven2231@hotmail.com)

Home Address: 67 Rhymer Ave. Stouffville, ON. L3C8H4

Joined: Wed Feb 01 2017 22:29:06 GMT-0500 (EST)

Customer 73: Melissa Bennett (mbennett@gmail.com)

Home Address: 3945 John St. Ajax, ON. L7M4T9

Joined: Wed Feb 01 2017 22:29:06 GMT-0500 (EST)

**HINT**: there is a function we will write called **getStoreById(store\_id)** that can help to get the name of the store with id 297 (for example).

1. **removeCustomerById ( customer\_id ) [6 marks]**

This method takes a number representing a customer\_id and searches through the customers array and removes the customer with the matching "customer\_id" property from the array.

This method must also ensure that **the corresponding address is removed** from the addresses array **only if** there are no other "customer" or "store" objects still using it. For example, if we remove Customer 26: Dave Bennett, we **cannot remove** his corresponding address (address\_id: 4536) because his wife, Melissa is still registered and still uses that address (address\_id: 4536).

However, If we choose to remove Customer 59: John Stevens, we **can remove** his address (address\_id: 2473), because nobody else is using it.

**HINT**: there is a function we will write called **removeAddressById(address\_id)** that will be perfect for this.

**HINT:** to remove elements from the middle of an array, you can either

(a) build a new array one element at a time, making sure to NOT include the element you don't want, or

(b) check out the [Array.prototype.splice()](https://developer.mozilla.org/en/docs/Web/JavaScript/Reference/Global_Objects/Array/splice) method.

## **Methods to work with "address" data**

The following are all methods that deal primarily with the "addresses" array. Any output for these functions is meant for the web console, so whenever the term "output" is used, you may assume that we're outputting to the console with console.log(). HINT: to refer to the "addresses" array from within these methods, use the "this" keyword, ie: "this.addresses".

1. **addAddress ( addressObj ) [1 mark]**

This method takes an object of type "address", and adds it to the "addresses" array.

1. **getAddressById ( address\_id ) [3 marks]**

This method takes a number representing an address\_id and searches through the "addresses" array looking for an address object that has a matching "address\_id". This method will return the corresponding address object, for example: **CustomerDB.getAddressById(2727);** will return the object with address " 287 Brant St. Apt 4A" in the city "Waterdown". E.g., object:

{address\_id: 2727, address: "287 Brant St. Apt 4A", city: "Waterdown", province: "ON", postal\_code: "R93G3P"}

1. **outputAllAddresses( ) [3 marks]**

This method takes no parameters and simply outputs all addresses in the following format, including a header at the top of the output stating "All Addresses": ie:

All Addresses

Address ***address\_id***: ***address* *city***, ***province***. ***postal\_code***

For Example, **outputAllAddresses();**

All Addresses

Address 1023: 2895 Yonge St. Toronto, ON. L4C02G

Address 1984: 3611 Main St. West Hamilton, ON. R5O8H5

Address 1757: 1177 Ontario St. Unit 8 Mississauga, ON. L9H6B3

*…etc…*

1. **removeAddressById ( address\_id ) [6 marks]**

This method takes a number representing an address\_id and searches through the addresses array and removes the address with the matching "address\_id" property **only if** the "address\_id" is not referenced by any "customer" objects in the customer array, or "store" objects in the "store" array.

For example, if we try to remove the address object with address\_id 4536 after Customer 26: Dave Bennett, has been removed, we **cannot remove** it because his wife Melissa is still a registered "customer" and still uses that address.

However, If we choose to remove the address object with address\_id 2727 after Customer 71: Martin Scott, has been removed, we **can remove** it, because nobody else is using it.

**HINT:** to remove elements from the middle of an array, you can either build a new array one element at a time, making sure to NOT include the element you don't want, or check out the [Array.prototype.splice()](https://developer.mozilla.org/en/docs/Web/JavaScript/Reference/Global_Objects/Array/splice) method.

## **Methods to work with "store" data**

The following are all methods that deal primarily with the "stores" array. Any output for these functions is meant for the web console, so whenever the term "output" is used, you may assume that we're outputting to the console with console.log(). HINT: to refer to the "stores" array from within these methods, use the "this" keyword, ie: "this.stores".

1. **addStore ( storeObj ) [1 mark]**

This method takes an object of type "store", and adds it to the "stores" array.

1. **getStoreById ( store\_id ) [3 marks]**

This method takes a number representing a store\_id and searches through the "stores" array looking for a store object that has a matching "store\_id". This method will return the corresponding store object, for example: **CustomerDB.getStoreById(297);** will return the object with name " Scotiabank - Main Branch".

1. **outputAllStores( ) [3 marks]**

This method takes no parameters and simply outputs all stores (including their address from the "addresses" array - **HINT**: the function **getAddressById(address\_id)** is perfect for this), in the following format, including a header at the top of the output stating "All Stores": ie:

All Stores

Store ***store\_id***: ***name***  
Location: ***address\_id***: ***address* *city***, ***province***. ***postal\_code***

For Example, **outputAllStores ();**

All Stores

Store 297: Scotiabank - Main Branch   
Location: 2895 Yonge St. Toronto, ON. L4C02G

Store 614: Scotiabank - Hamilton   
Location: 3611 Main St. West Hamilton, ON. R5O8H5

Store 193: Scotiabank - Mississauga   
Location: 1177 Ontario St. Unit 8 Mississauga, ON. L9H6B3

1. **testing and supporting code as need [3 marks]**

## TEST DATA Output

Once you're ready to test your solution, uncomment the "TEST DATA" block of code and run your code. If your console output looks like the sample (***A2-TEST-DATA-Output.pdf***), everything should be working properly.

Please Note, your "Joined:" dates will be different, as you will run your program at a different time.

## Assignment Submission:

Make sure that the "TEST DATA" block of code is uncommented and that your solution gives the correct output (refer to ***A2-TEST-DATA-Output.pdf***).

* Add the following declaration at the top of your code:

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
\* BTI225 – Assignment 02  
\* I declare that this assignment is my own work in accordance with Seneca Academic Policy.

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* Submit your **a2.js** file to My.Seneca under **Assignments** -> **Assignment** 2