Practice exercise 3.1

1. Create an array to use as your shopping list with 3 items:
2. Check your list length in the console.
3. Update "Bread" to "Bananas."
4. Output your entire list to the console.

Solution:

```
let shoppingList = ["Milk", "Bread", "Apples"];
console.log(shoppingList.length)
shoppingList[1] = "Bananas";
console.log(shoppingList);
```

Output:

```
3
[ 'Milk', 'Bananas', 'Apples' ]
```

Practice exercise 3.2

1. Create an empty array to use as a shopping list.
2. Add Milk, Bread, and Apples to your list.
3. Update "Bread" with Bananas and Eggs.
4. Remove the last item from the array and output it into the console.
5. Sort the list alphabetically.
6. Find and output the index value of Milk.
7. After Bananas, add Carrots and Lettuce.
8. Create a new list containing Juice and Pop.
9. Combine both lists, adding the new list twice to the end of the first list.
10. Get the last index value of Pop and output it to the console.
11. Your final list should look like this:

Solution:

```
// Create an empty shopping list
let shoppingList = [];
```

```
// Add Milk, Bread, and Apples
shoppingList.push("Milk", "Bread", "Apples");
// Update "Bread" with Bananas and Eggs
let breadIndex = shoppingList.indexOf("Bread");
if (breadIndex !== -1) {
  // Remove Bread and insert Bananas and Eggs at that position
  shoppingList.splice(breadIndex, 1, "Bananas", "Eggs");
}
// Remove the last item and output it to the console
let removedItem = shoppingList.pop();
console.log("Removed item:", removedItem);
// Sort the list alphabetically
shoppingList.sort();
// Find and output the index of "Milk"
let milkIndex = shoppingList.indexOf("Milk");
console.log("Index of Milk:", milkIndex);
// After Bananas, add Carrots and Lettuce
let bananaIndex = shoppingList.indexOf("Bananas");
if (bananaIndex !== -1) {
  shoppingList.splice(bananaIndex + 1, 0, "Carrots", "Lettuce");
}
// Create a new list containing Juice and Pop
let newList = ["Juice", "Pop"];
// Combine both lists, adding the new list twice to the end of the first list
let combinedList = shoppingList.concat(newList, newList);
// Get the last index value of "Pop" and output it to the console
let lastIndexOfPop = combinedList.lastIndexOf("Pop");
console.log("Last index of Pop:", lastIndexOfPop);
// Optional: View the final list
console.log("Final combined list:", combinedList);
```

Output:

```
Removed item: Apples
Index of Milk: 2
Last index of Pop: 8
Final combined list: [
  'Bananas', 'Carrots',
  'Lettuce', 'Eggs',
  'Milk',    'Juice',
  'Pop',     'Juice',
  'Pop'
]
```

Practice exercise 3.3

1. Create an array containing three values: 1, 2, and 3.
2. Nest the original array into a new array three times.
3. Output the value 2 from one of the arrays into the console.

Solution:

```
// 1. Create an array containing three values: 1, 2, and 3
let originalArray = [1, 2, 3];
// 2. Nest the original array into a new array three times
let nestedArray = [originalArray, originalArray, originalArray];
// 3. Output the value 2 from one of the arrays into the console
console.log(nestedArray[0][1]); // Outputs: 2
```

Output:

```
2
```

Practice exercise 3.4

1. Create a new myCar object for a car. Add some properties, including, but not limited to, make and model, and values for a typical car or your car. Feel free to use booleans, strings, or numbers.

   Solution:

```
let myCar = {
   make: "Toyota",
   model: "Corolla",
   year: 2020,
   color: "Blue",
   isElectric: false,
   mileage: 35000,
   hasSunroof: true,
   owner: "Shuvom"
};

console.log(myCar.make);      // Toyota
console.log(myCar["model"]);  // Corolla
```

   Output:

```
Toyota
Corolla
```

Practice exercise 3.5

1. Create an object named people that contains an empty array that is called friends.

2. Create three variables, each containing an object, that contain one of your friend's first names, last names, and an ID value.

3. Add the three friends to the friend array.

4. Output it to the console.

Solution:

```
// 1. Create an object named 'people' with an empty array called 'friends'
let people = {
   friends: []
};
// 2. Create three variables with friend objects
let friend1 = {
   firstName: "Alice",
   lastName: "Smith",
   id: 1
};
let friend2 = {
   firstName: "Bob",
   lastName: "Johnson",
   id: 2
};
let friend3 = {
   firstName: "Charlie",
   lastName: "Brown",
   id: 3
};
// 3. Add the three friends to the 'friends' array
people.friends.push(friend1, friend2, friend3);
// 4. Output to the console
console.log(people);
```

Output:

```
{
  friends: [
    { firstName: 'Alice', lastName: 'Smith', id: 1 },
    { firstName: 'Bob', lastName: 'Johnson', id: 2 },
    { firstName: 'Charlie', lastName: 'Brown', id: 3 }
  ]
}
```

Company product catalog

1. Create an array to hold an inventory of store items.

2. Create three items, each having the properties of name, model, cost, and quantity.

3. Add all three objects to the main array using an array method, and then log the inventory array to the console.

4. Access the quantity element of your third item, and log it to the console. Experiment by adding and accessing more elements within your data structure.

Solution:

```
// 1. Create an array to hold the inventory of store items
let inventory = [];
// 2. Create three items with properties: name, model, cost, and quantity
let item1 = {
  name: "Laptop",
  model: "Dell XPS 13",
  cost: 1200,
  quantity: 5
```

```
};
let item2 = {
  name: "Smartphone",
  model: "iPhone 14",
  cost: 999,
  quantity: 10
};
let item3 = {
  name: "Headphones",
  model: "Sony WH-1000XM5",
  cost: 349,
  quantity: 15
};
// 3. Add all three objects to the inventory array using an array method
inventory.push(item1, item2, item3);
// Log the entire inventory
console.log("Full Inventory:", inventory);
// 4. Access the quantity of the third item and log it
console.log("Quantity of third item:", inventory[2].quantity);
// Optional: Experiment by adding another item
let item4 = {
  name: "Smartwatch",
  model: "Samsung Galaxy Watch 6",
  cost: 299,
  quantity: 8
};
```

// Add new item to inventory

inventory.push(item4);

// Access the name and cost of the newly added item

console.log("New item added:", inventory[3].name, "- Cost:", inventory[3].cost);

Output:

```
Full Inventory: [
  { name: 'Laptop', model: 'Dell XPS 13', cost: 1200, quantity: 5 },
  { name: 'Smartphone', model: 'iPhone 14', cost: 999, quantity: 10 },
  {
    name: 'Headphones',
    model: 'Sony WH-1000XM5',
    cost: 349,
    quantity: 15
  }
]
Quantity of third item: 15
New item added: Smartwatch - Cost: 299
```