Shop V2.0 - An Array of Product

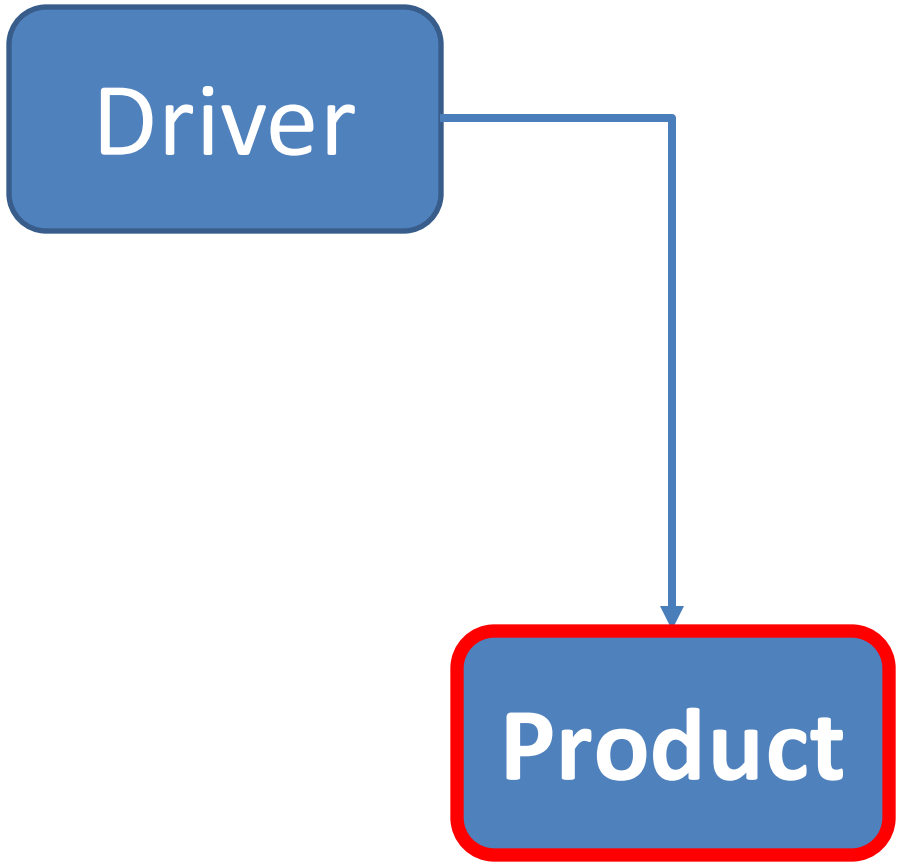
Produced by:

Ms. Maireád Meagher
Dr. Siobhán Drohan
Ms Siobhan Roche

SETU
Ollscoil Teicneolaíochta an Oirdheiscirt
South East Technological University

Department of Computing and Mathematics
http://www.setu.ie/

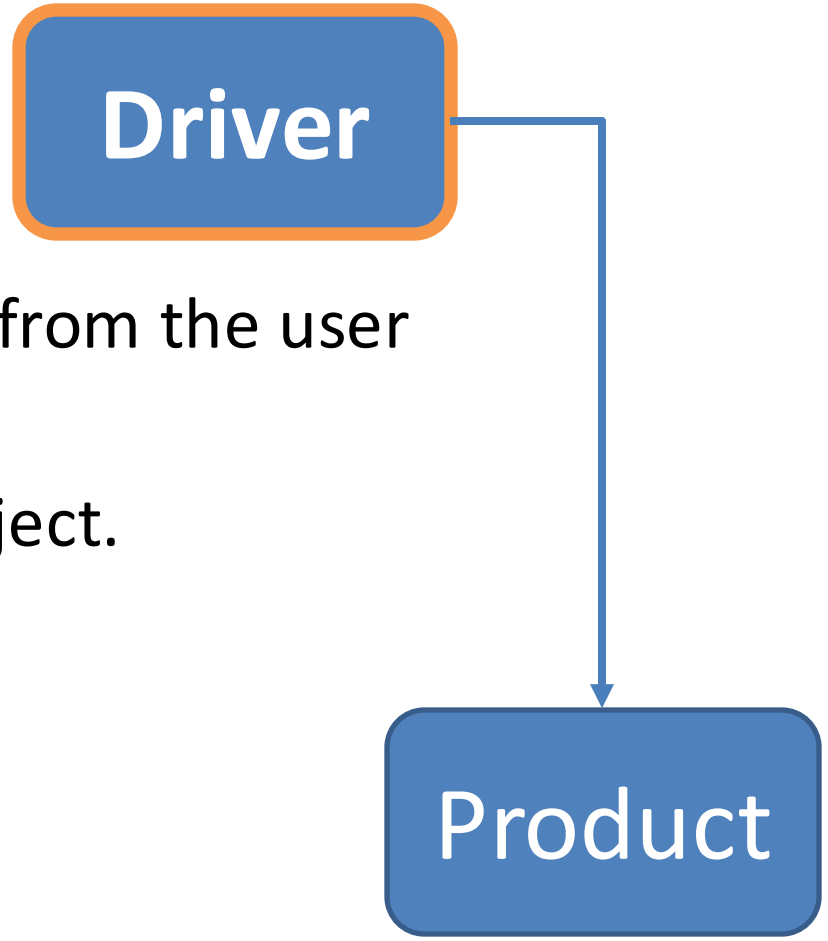
Recap: Shop V1.0 - **Product**



- The **Product** class stores **details** about a product
  - name
  - code
  - unit cost
  - in the current product line or not?

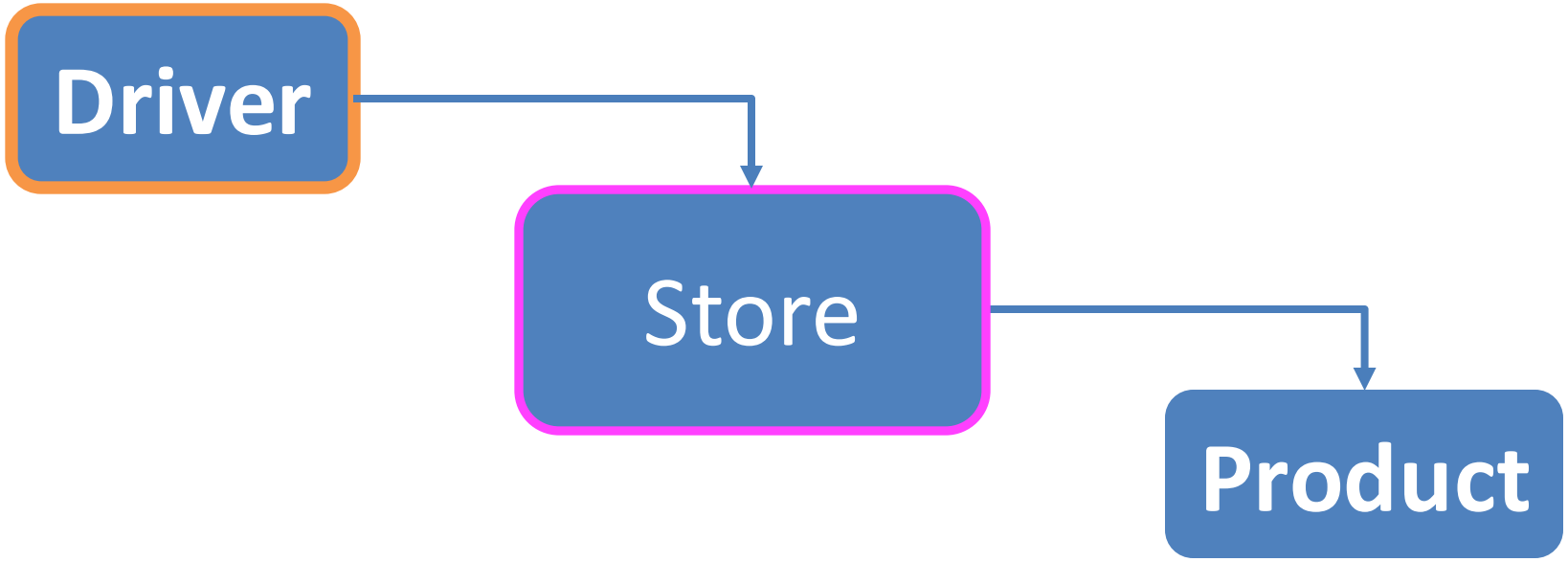
Recap: Shop V1.0 - **Driver**

- The **Driver** class
  - has the **main()** method.
  - **reads** the product details from the user (via the console)
  - **creates** a new Product object.
  - **prints** the product object (to the console)

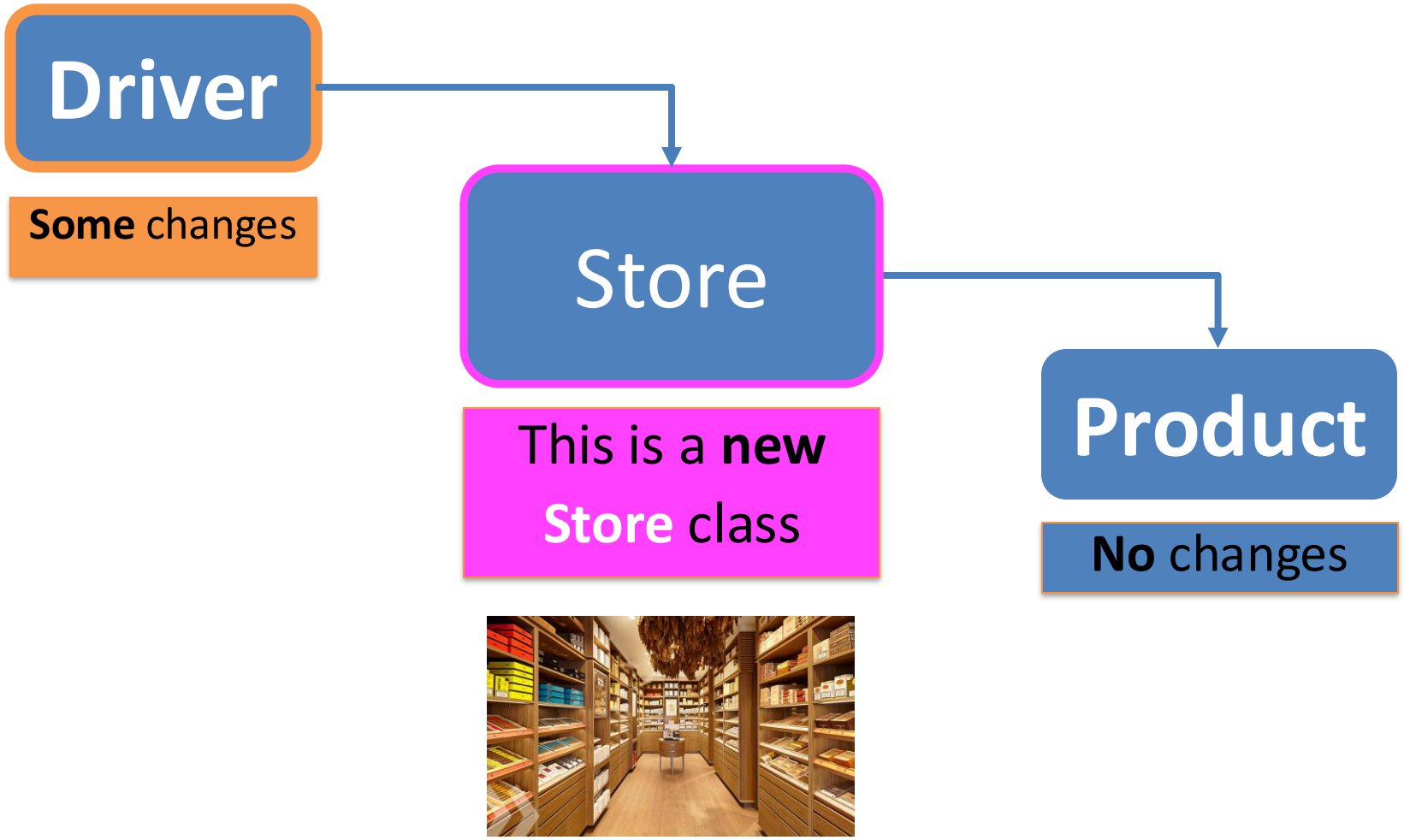


Shop **V2.0**

- New **Store** class is responsible for maintaining a collection of Products
  - i.e. an **array of Products**.
- **Driver** will now allow the user to decide **how many product** details they want to store.



Shop **V2.0** – **changes** to classes



Store – new class

Store

constructor

Store(int)

isFull(): boolean

isEmpty(): boolean

add(Product): boolean

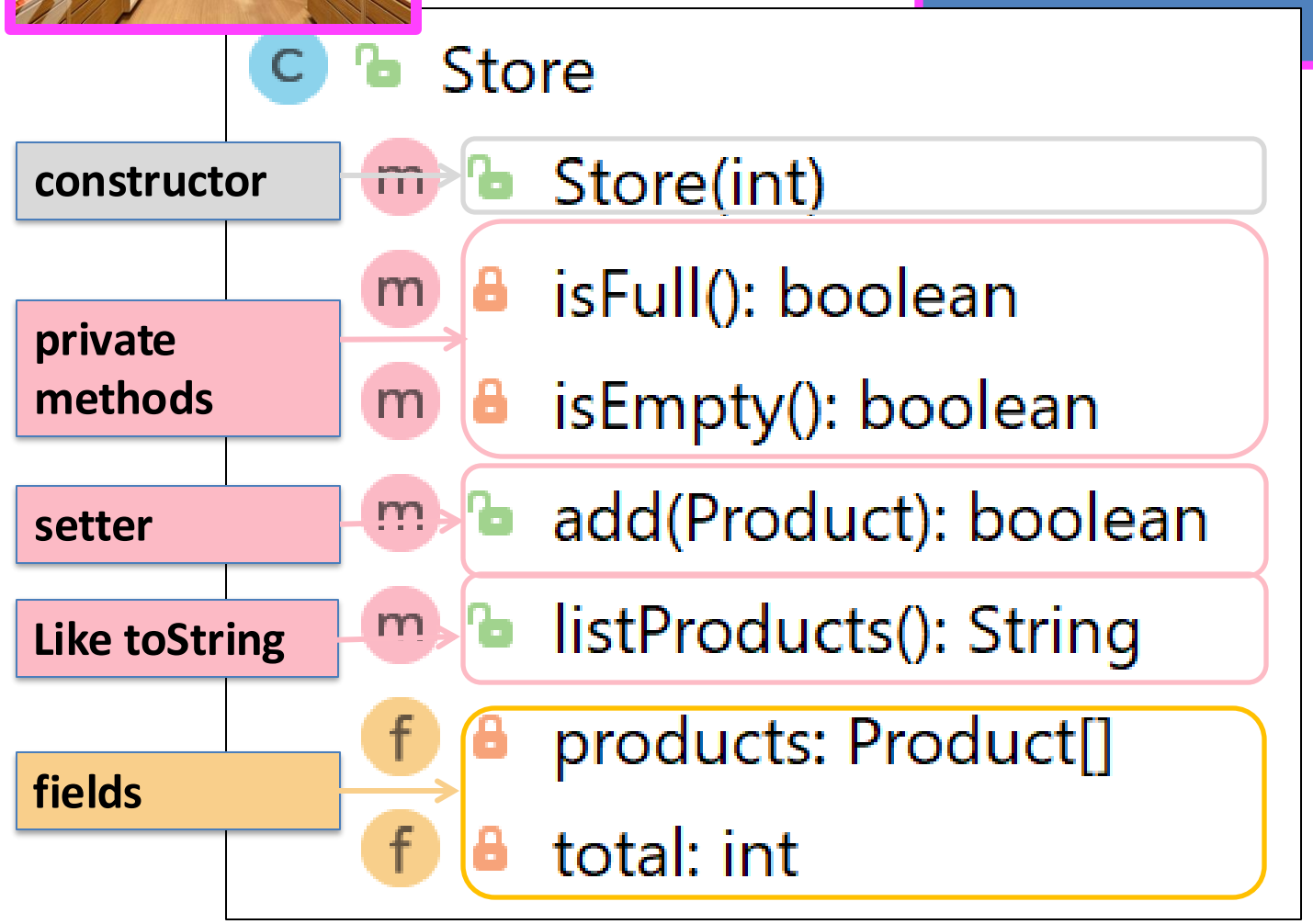
listProducts(): String

fields

products: Product[]

total: int

Store – new class

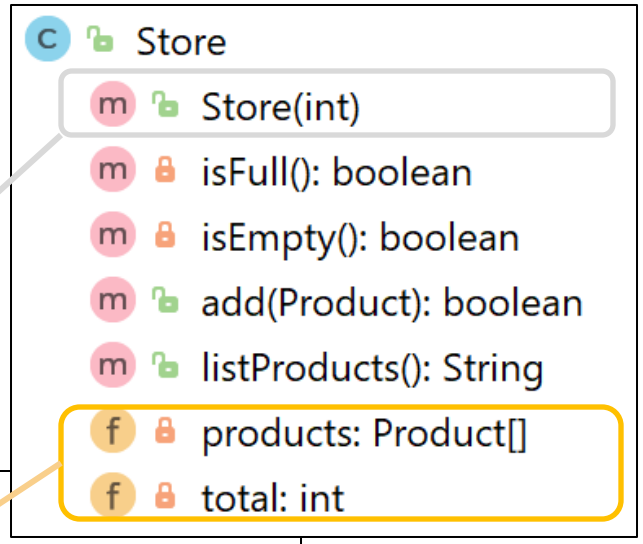


- Store
  - Store(int)
  - isFull(): boolean
  - isEmpty(): boolean
  - add(Product): boolean
  - listProducts(): String
  - products: Product[]
  - total: int

```
public class Store {

    private Product[] products;
    private int total = 0;

    public Store(int numberItems){
        products = new Product[numberItems];
    }

    //other methods
}
```

fields

Why private?




```
public class Store {

    private Product[] products;
    private int total = 0;

    public Store(int numberItems){
        products = new Product[numberItems];
    }

    //other methods
}
```

fields

constructor

Why private?

```
private boolean isFull(){
    return (total == products.length);
}

private boolean isEmpty(){
    return (total == 0);
}

public boolean add(Product product){
    if (isFull()){
        return false;
    }
    else{
        products[total] = product;
        total++;
        return true;
    }
}
```

- Store
  - Store(int)
  - isFull(): boolean
  - isEmpty(): boolean
  - add(Product): boolean
  - listProducts(): String
  - products: Product[]
  - total: int

getters
isFull() & **isEmpty()**
return state of fields.

They are private member methods

setter
add() makes use of private method **isFull()**

- Store
  - Store(int)
  - isFull(): boolean
  - isEmpty(): boolean
  - add(Product): boolean
  - listProducts(): String
  - products: Product[]
  - total: int

```
public String listProducts(){
    if (isEmpty()){
        return "No products";
    }
    else{
         String listOfProducts = "";
         for (int i = 0; i < total; i++){
             listOfProducts += i + ": " + products[i] + "\n";
         }
         return listOfProducts;
    }
}
```

toString type method **listProducts()** makes use of private method **isEmpty()**

Driver

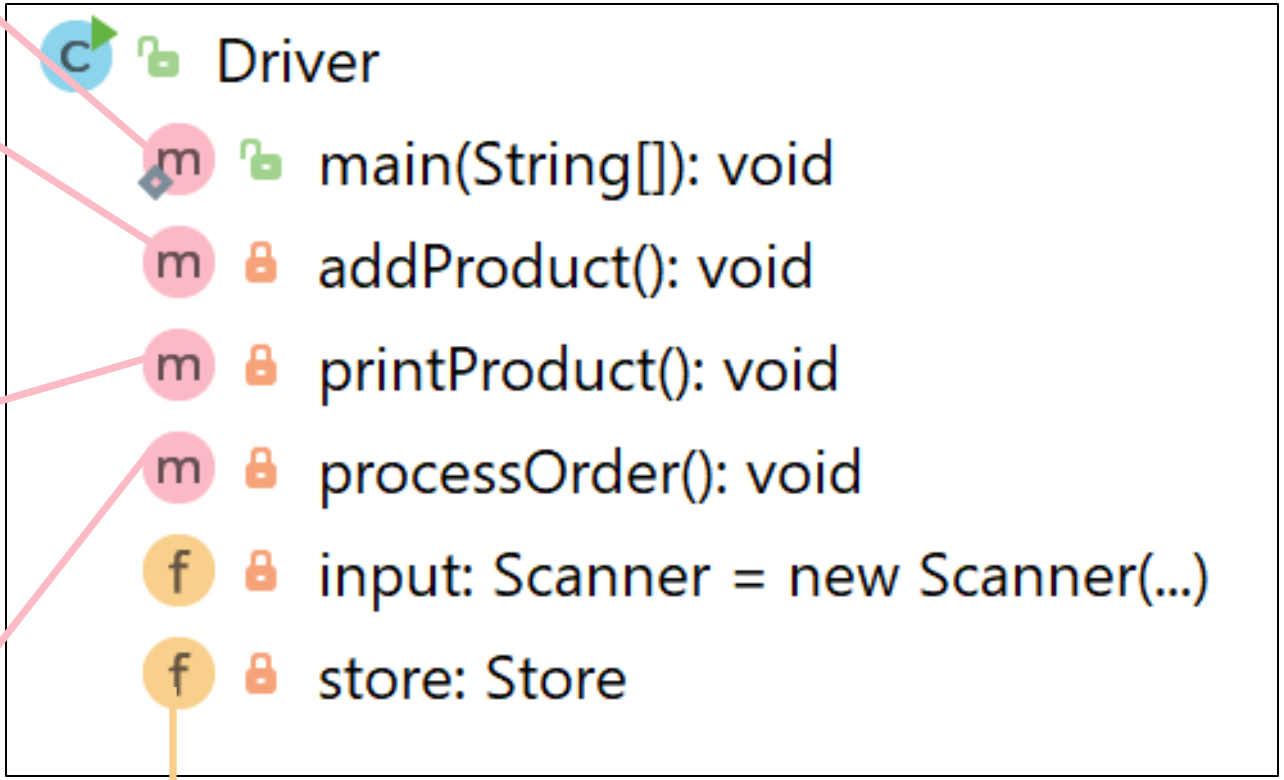
5 changes

4) main() changed to call **processOrder()**

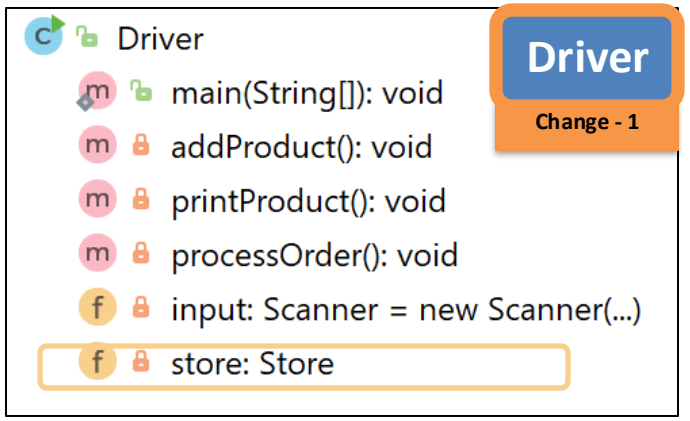
2) addProduct() changed to add the entered product to the array.

5) printProduct() changed to print out all products in the array.

3) New method, **processOrder()**, reads in products from the user.



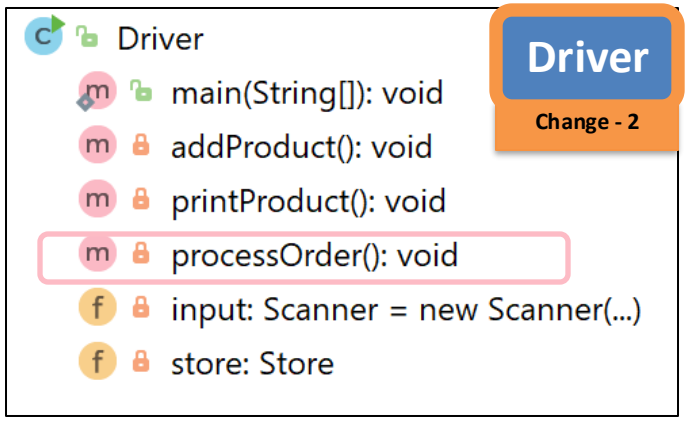
1) Product object removed and replaced with **Store** object.




```java
import java.util.Scanner;

public class Driver{

    private Scanner input = new Scanner(System.in);
    private Store store;

    //code omitted
}
```

1) Product object removed and replaced with **Store** object.

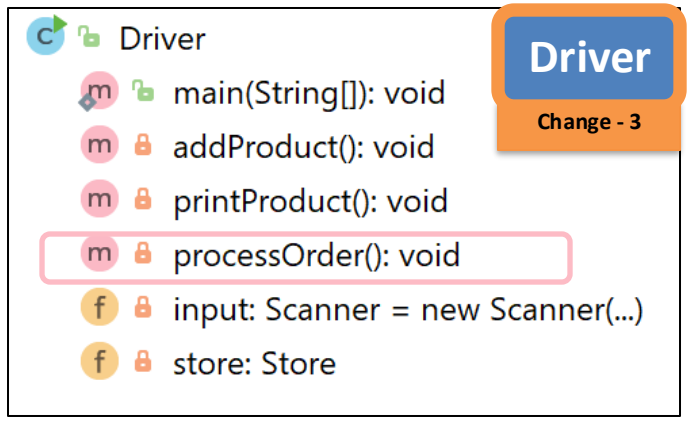
2) New method, **processOrder()**, reads in products from the user.




```
private void processOrder(){
    //find out from the user how many products they would like to order
    System.out.print("How many Products would you like to have in your Store? ");
    int numberProducts = input.nextInt();

    store = new Store(numberProducts);

    //ask the user for the details of the products and add them to the order
    for (int i = 0; i < numberProducts; i++){
        addProduct();
    }
}
```

- Asks how many?
- Pass into Store constructor to initialise an array to that size
- Calls addProduct() for each one

3) main() changed to call **processOrder()**

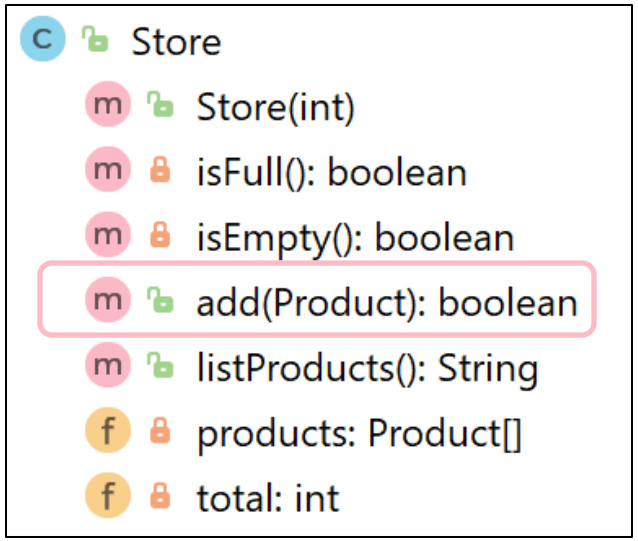



```
public static void main(String[] args) {
    Driver driver = new Driver();
    driver.processOrder();
    driver.printProduct();
}
```

Store

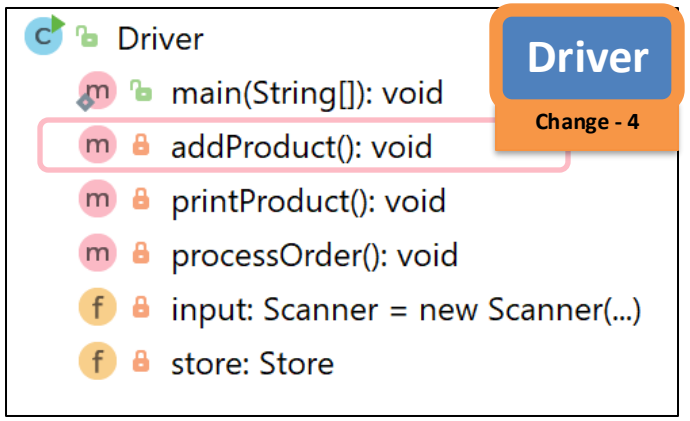
If there is space in the Array, the Product, passed as a parameter is added to the Primitive Array.

A boolean result is returned indicating whether the product was added successfully or not.




```
public boolean add(Product product){
   if (isFull()){
      return false;
   }
   else{
      products[total] = product;
      total++;
      return true;
   }
}
```

4) addProduct() changed to add the entered product to the array.



Driver

The addProduct() method needs to be updated to:

1. Add the product object to the array of products in Store
2. Interrogate the Boolean result returned to let the user know if the update was successful or not.

```
private void addProduct(){
   input.nextLine();  //dummy read of String to clear the buffer - bug in Scanner class.

   System.out.print("Enter the Product Name:  ");
    String productName = input.nextLine();
    System.out.print("Enter the Product Code:  ");
    int productCode = input.nextInt();
    System.out.print("Enter the Unit Cost:  ");
    double unitCost = input.nextDouble();

    //Ask the user to type in either a Y or an N then convert to boolean value
   System.out.print("Is this product in your current line (y/n): ");
   char currentProduct = input.next().charAt(0);
   boolean inCurrentProductLine = false;
   if ((currentProduct == 'y') || (currentProduct == 'Y'))
      inCurrentProductLine = true;

    boolean isAdded = store.add(new Product(productName, productCode, unitCost, inCurrentProductLine));
    if (isAdded){
       System.out.println("Product Added Successfully");
    }
    else{
       System.out.println("No Product Added");
    }
}
```

```
private void addProduct(){
   input.nextLine();  //dummy read of String to clear the buffer - bug in Scanner class.

   System.out.print("Enter the Product Name:  ");
   String productName = input.nextLine();
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   System.out.print("Is this product in your current line (y/n): ");
   char currentProduct = input.next().charAt(0);
   boolean inCurrentProductLine = false;
   if ((currentProduct == 'y') || (currentProduct == 'Y'))
      inCurrentProductLine = true;

   boolean isAdded = store.add(new Product(productName, productCode, unitCost, inCurrentProductLine));
   if (isAdded){
      System.out.println("Product Added Successfully");
   }
   else{
      System.out.println("No Product Added");
   }
}
```

Read in a **string**

Read in an **int**

Read in an **double**

Read in an **char**

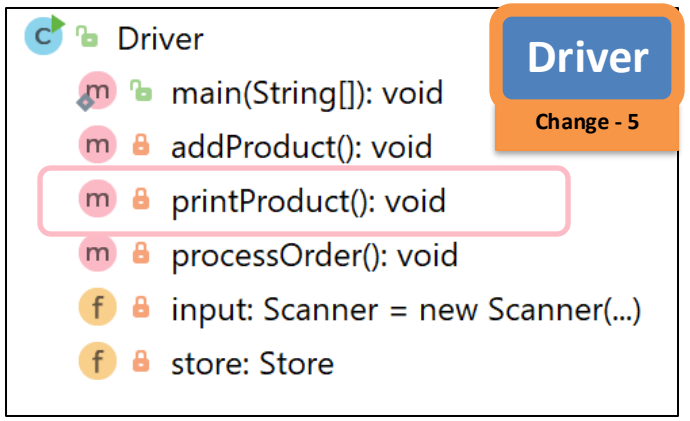
Set **boolean** based on char value

```
private void addProduct(){
   input.nextLine();  //dummy read of String to clear the buffer - bug in Scanner class.

   System.out.print("Enter the Product Name:  ");
    String productName = input.nextLine();
    System.out.print("Enter the Product Code:  ");
    int productCode = input.nextInt();
    System.out.print("Enter the Unit Cost:  ");
    double unitCost = input.nextDouble();

    //Ask the user to type in either a Y or an N then convert to boolean value
   System.out.print("Is this product in your current line (y/n): ");
   char currentProduct = input.next().charAt(0);
   boolean inCurrentProductLine = false;
   if ((currentProduct == 'y') || (currentProduct == 'Y'))
      inCurrentProductLine = true;

    boolean isAdded = store.add(new Product(productName, productCode, unitCost, inCurrentProductLine));
    if (isAdded){
       System.out.println("Product Added Successfully");
    }
    else{
       System.out.println("No Product Added");
    }
}
```

The Store add method is called to add the product to the primitive array, if space is available.

Console response if add was successful

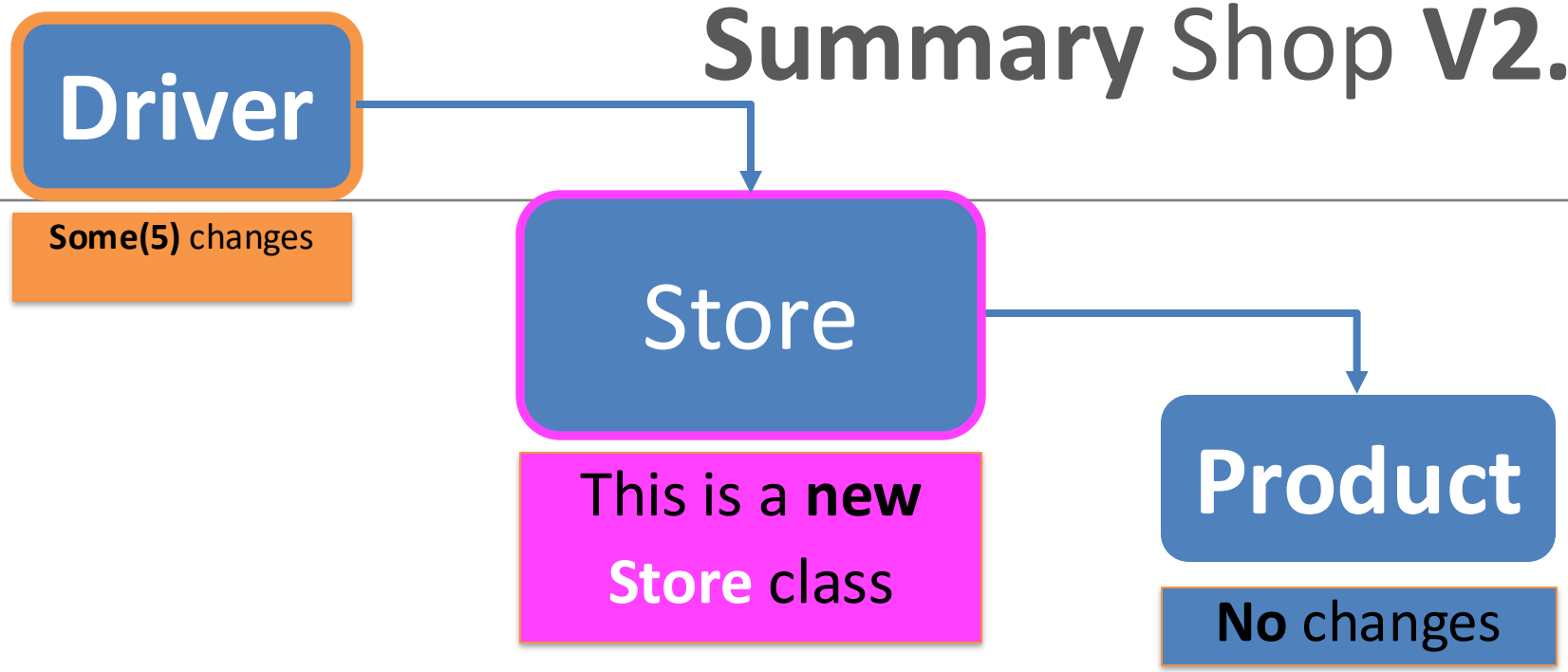
Console response if add was unsuccessful



5) printProduct() changed to print out all products in the array.

```
private void printProduct(){

    System.out.println(store.listProducts());

}
```

Summary Shop **V2.0**



- **Store** class maintains a collection of Products
  i.e. an **array of Products**; store.Products[]

- **Driver** allows the user to decide **how many product** details they want to store. Methods updated to work with this new **store.Products[]** array

Questions?