Shop V2.2 - An Array of Product with a basic menu

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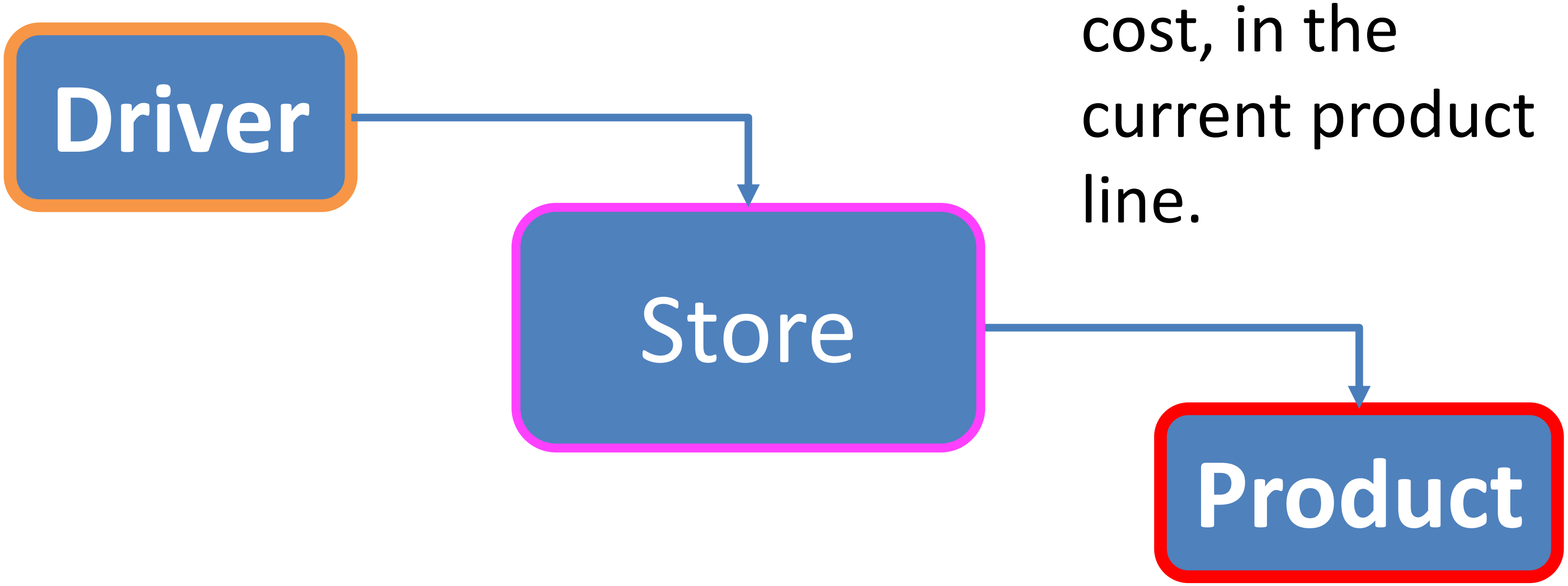
Shop V2.0

A Recap of the Classes

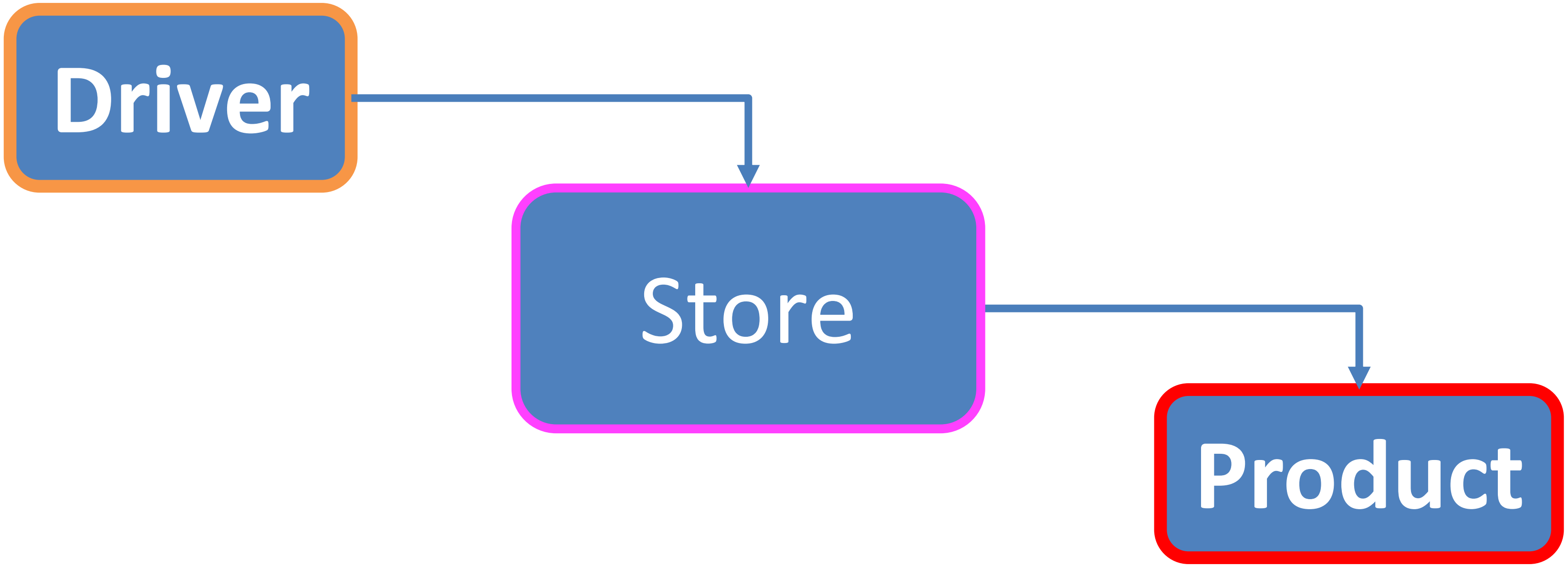
Recap - Shop **V2.0 - Product**

- The **Product** class stores **details** about a product
  - name, code, unit cost, in the current product line.



Recap - Shop **V2.0**

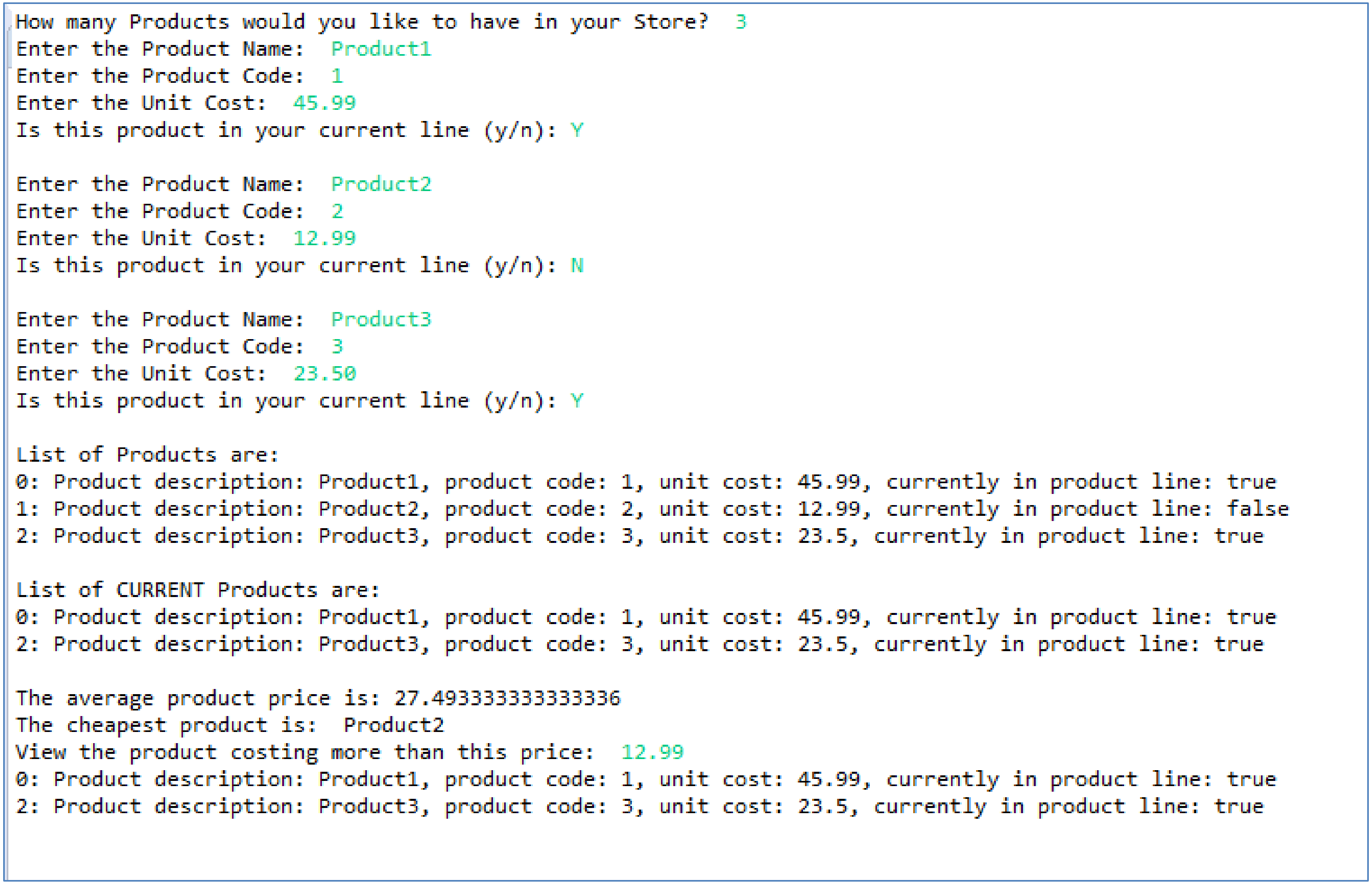
- New **Store** class is responsible for maintaining a collection of Products
  - i.e. an **array of Products**.
- **Driver** will now allow the user to decide **how many product** details they want to store.



Shop V2.1

Version developed in Lab Exercises

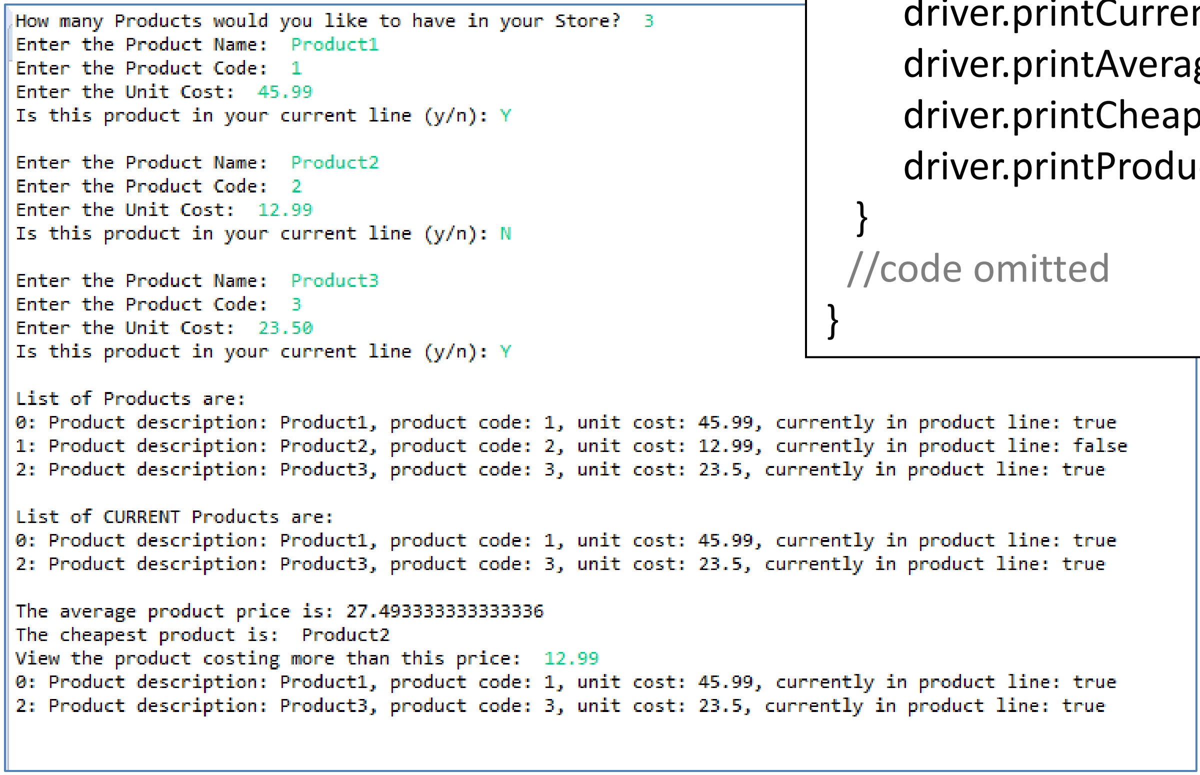
Shop V2.1 – Lab Exercises



```
How many Products would you like to have in your Store?  3
Enter the Product Name:  Product1
Enter the Product Code:  1
Enter the Unit Cost:  45.99
Is this product in your current line (y/n): Y

Enter the Product Name:  Product2
Enter the Product Code:  2
Enter the Unit Cost:  12.99
Is this product in your current line (y/n): N

Enter the Product Name:  Product3
Enter the Product Code:  3
Enter the Unit Cost:  23.50
Is this product in your current line (y/n): Y

List of Products are:
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
1: Product description: Product2, product code: 2, unit cost: 12.99, currently in product line: false
2: Product description: Product3, product code: 3, unit cost: 23.5, currently in product line: true

List of CURRENT Products are:
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
2: Product description: Product3, product code: 3, unit cost: 23.5, currently in product line: true

The average product price is: 27.493333333333336
The cheapest product is:  Product2
View the product costing more than this price:  12.99
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
2: Product description: Product3, product code: 3, unit cost: 23.5, currently in product line: true
```

Shop V2.1 – Lab Exercises

```
public class Driver{

   //code omitted

   public static void main(String[] args) {
      Driver driver = new Driver();
      driver.processOrder();
      driver.printProducts();
      driver.printCurrentProducts();
      driver.printAverageProductPrice();
      driver.printCheapestProduct();
      driver.printProductsAboveAPrice();
   }
  //code omitted
}
```



```
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Enter the Product Name:  Product1
Enter the Product Code:  1
Enter the Unit Cost:  45.99
Is this product in your current line (y/n): Y

Enter the Product Name:  Product2
Enter the Product Code:  2
Enter the Unit Cost:  12.99
Is this product in your current line (y/n): N

Enter the Product Name:  Product3
Enter the Product Code:  3
Enter the Unit Cost:  23.50
Is this product in your current line (y/n): Y

List of Products are:
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View the product costing more than this price:  12.99
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
2: Product description: Product3, product code: 3, unit cost: 23.5, currently in product line: true
```

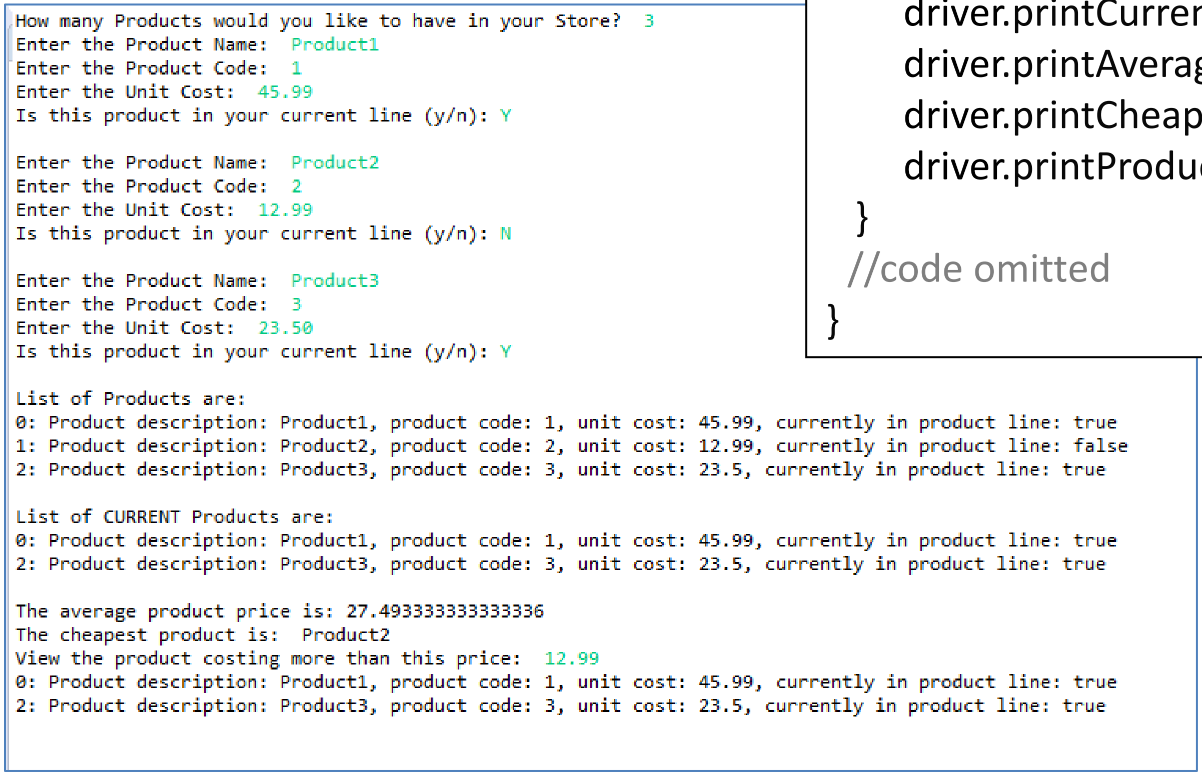
Shop V2.1 – Lab Exercises

Our users have no control of the system; they cannot **choose** to do anything!

```
public class Driver{

   //code omitted

   public static void main(String[] args) {
      Driver driver = new Driver();
      driver.processOrder();
      driver.printProducts();
      driver.printCurrentProducts();
      driver.printAverageProductPrice();
      driver.printCheapestProduct();
      driver.printProductsAboveAPrice();
  }
  //code omitted
}
```



```
How many Products would you like to have in your Store?  3
Enter the Product Name:  Product1
Enter the Product Code:  1
Enter the Unit Cost:  45.99
Is this product in your current line (y/n): Y

Enter the Product Name:  Product2
Enter the Product Code:  2
Enter the Unit Cost:  12.99
Is this product in your current line (y/n): N

Enter the Product Name:  Product3
Enter the Product Code:  3
Enter the Unit Cost:  23.50
Is this product in your current line (y/n): Y

List of Products are:
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
1: Product description: Product2, product code: 2, unit cost: 12.99, currently in product line: false
2: Product description: Product3, product code: 3, unit cost: 23.5, currently in product line: true

List of CURRENT Products are:
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
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View the product costing more than this price:  12.99
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
2: Product description: Product3, product code: 3, unit cost: 23.5, currently in product line: true
```
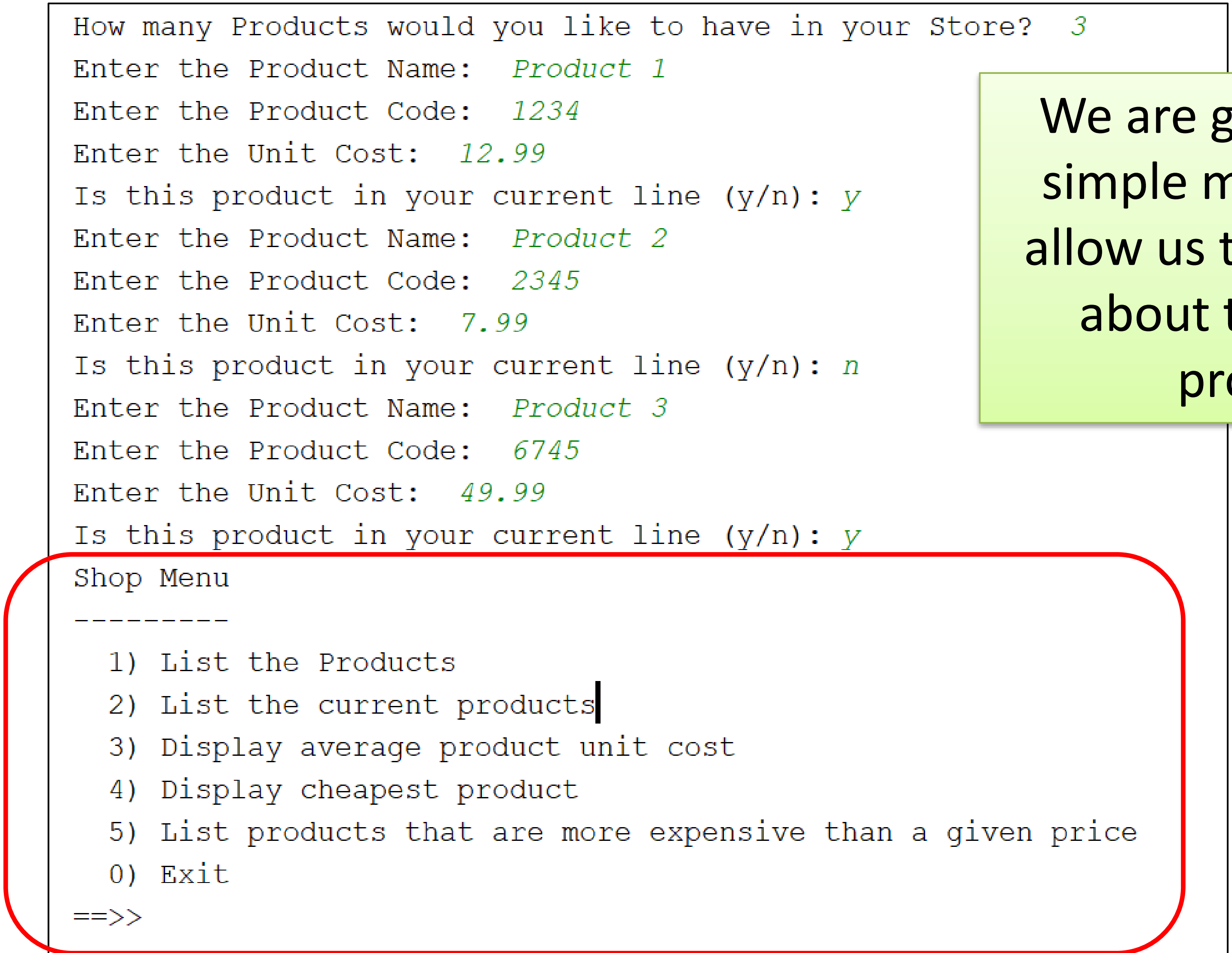

Shop V2.2

Adding a
menu system

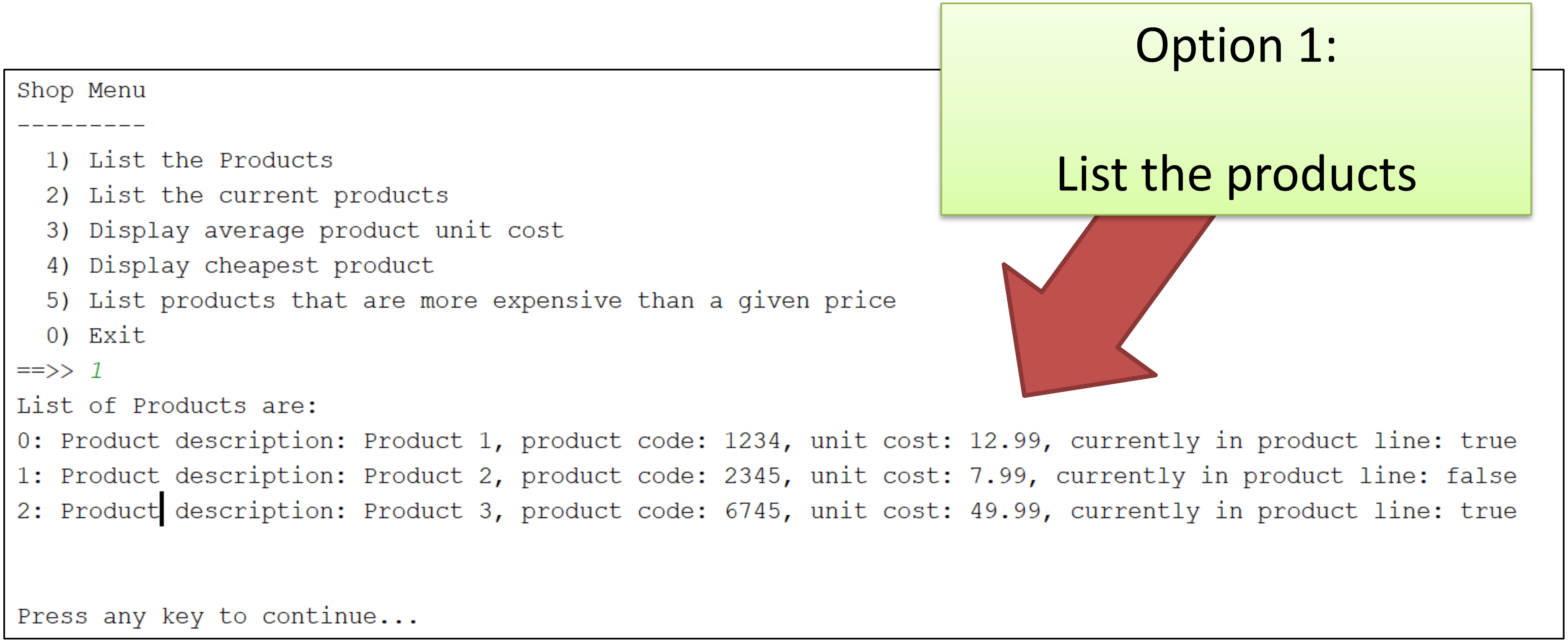
Shop V2.2 – Control with menu



```
How many Products would you like to have in your Store?  3
Enter the Product Name:  Product 1
Enter the Product Code:  1234
Enter the Unit Cost:  12.99
Is this product in your current line (y/n): y
Enter the Product Name:  Product 2
Enter the Product Code:  2345
Enter the Unit Cost:  7.99
Is this product in your current line (y/n): n
Enter the Product Name:  Product 3
Enter the Product Code:  6745
Enter the Unit Cost:  49.99
Is this product in your current line (y/n): y
Shop Menu
---------
  1) List the Products
  2) List the current products
  3) Display average product unit cost
  4) Display cheapest product
  5) List products that are more expensive than a given price
  0) Exit
==>>
```

We are going to add a simple menu that will allow us to view details about the entered products.

Shop V2.2 – Control with menu

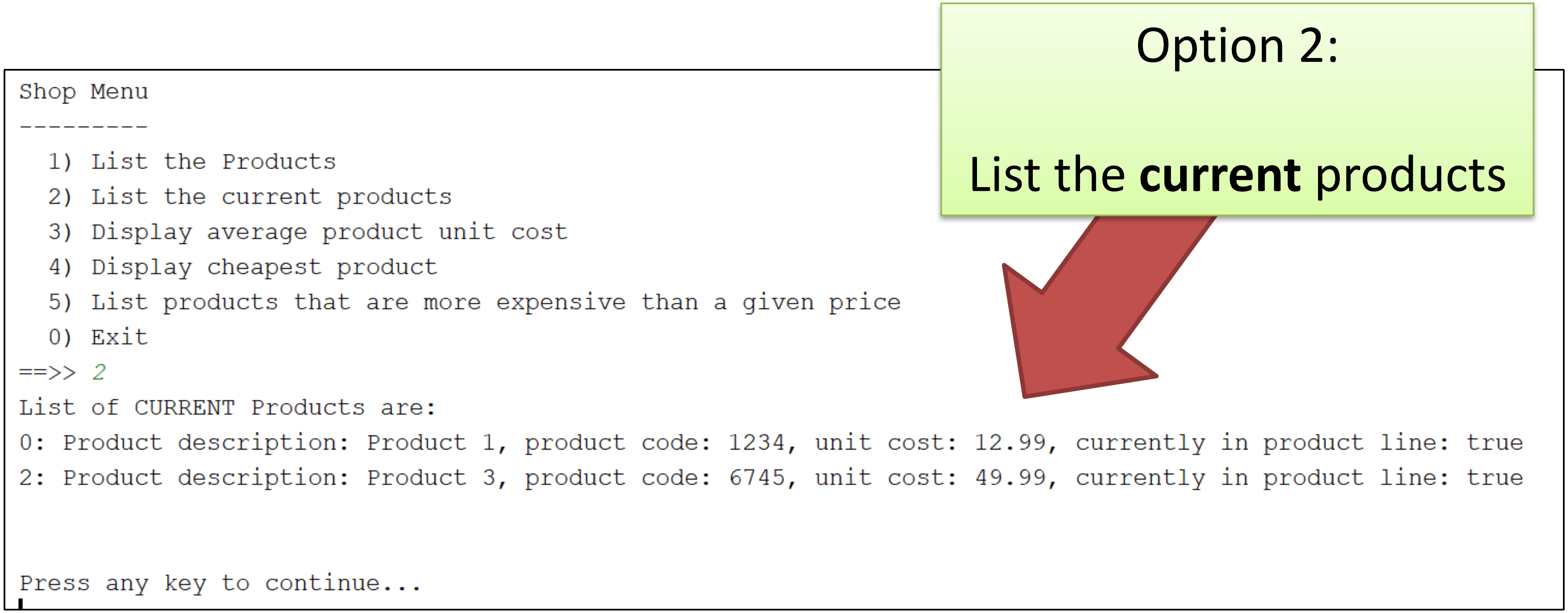


```
Shop Menu
---------
  1) List the Products
  2) List the current products
  3) Display average product unit cost
  4) Display cheapest product
  5) List products that are more expensive than a given price
  0) Exit
==>> 1
List of Products are:
0: Product description: Product 1, product code: 1234, unit cost: 12.99, currently in product line: true
1: Product description: Product 2, product code: 2345, unit cost: 7.99, currently in product line: false
2: Product description: Product 3, product code: 6745, unit cost: 49.99, currently in product line: true


Press any key to continue...
```

Option 1:

List the products

Shop V2.2 – Control with menu

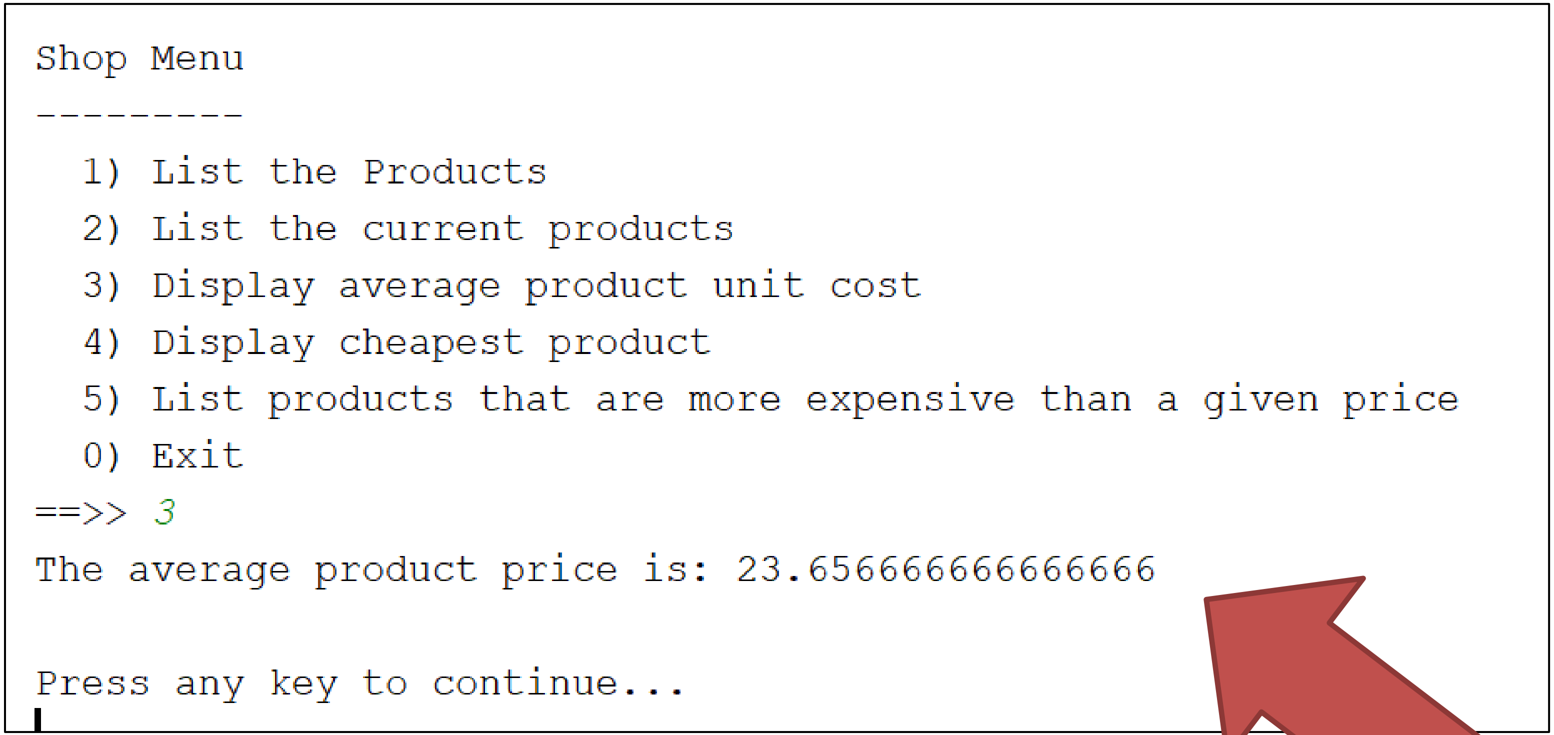


```
Shop Menu
---------
  1) List the Products
  2) List the current products
  3) Display average product unit cost
  4) Display cheapest product
  5) List products that are more expensive than a given price
  0) Exit
==>> 2
List of CURRENT Products are:
0: Product description: Product 1, product code: 1234, unit cost: 12.99, currently in product line: true
2: Product description: Product 3, product code: 6745, unit cost: 49.99, currently in product line: true


Press any key to continue...
```

Option 2:

List the **current** products

Shop V2.2 – Control with menu

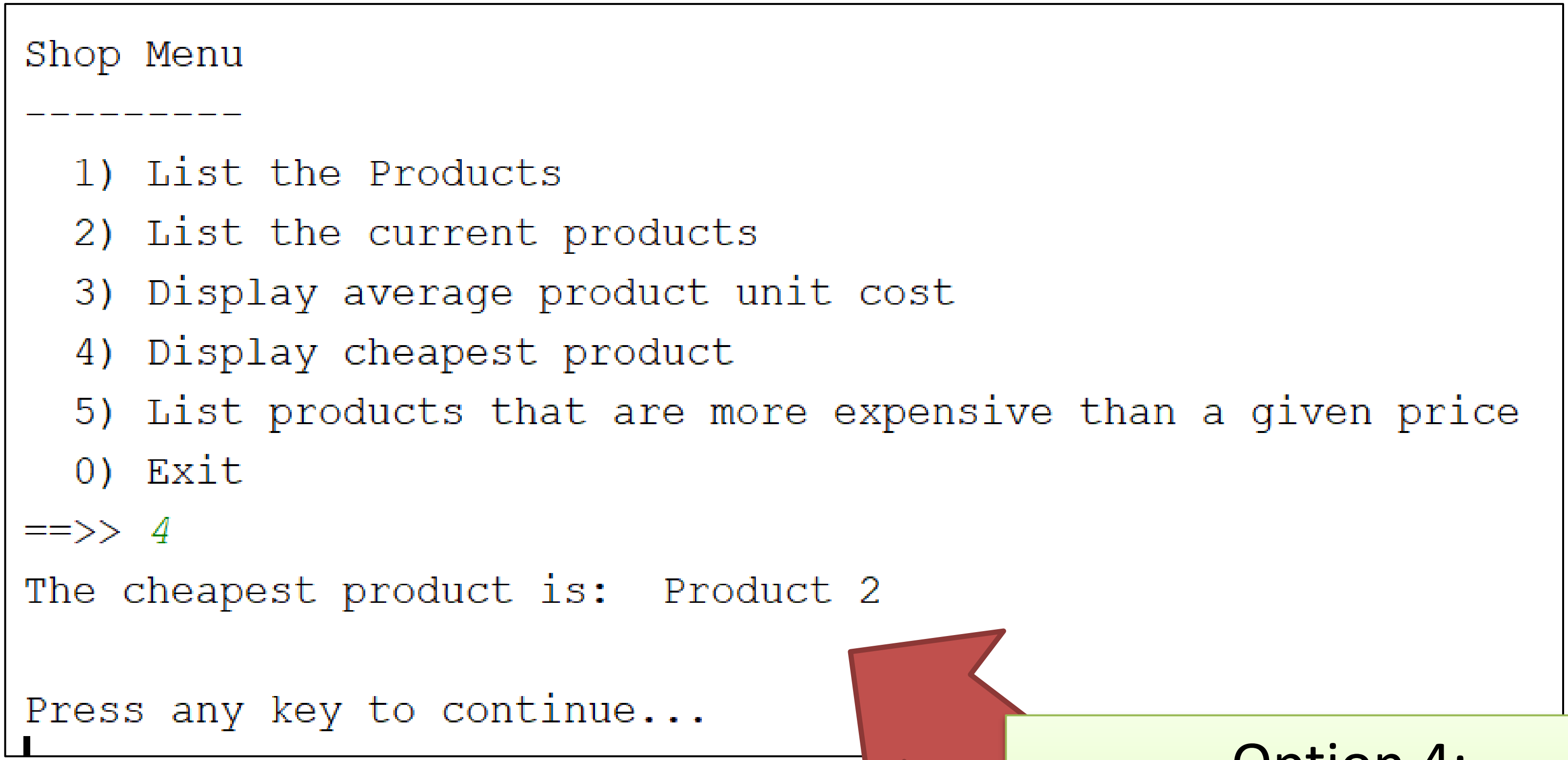


```
Shop Menu
----------
  1) List the Products
  2) List the current products
  3) Display average product unit cost
  4) Display cheapest product
  5) List products that are more expensive than a given price
  0) Exit
==>> 3
The average product price is: 23.656666666666666

Press any key to continue...
```

Option 3:

Display average cost

Shop V2.2 – Control with menu

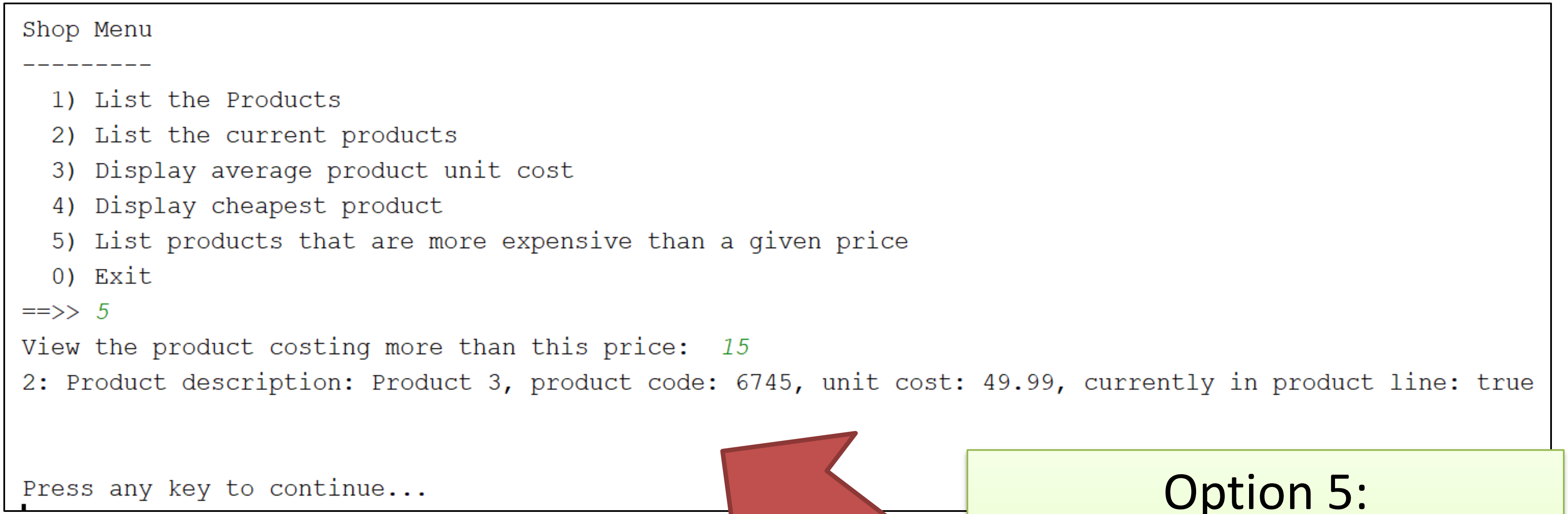


```
Shop Menu
---------
  1) List the Products
  2) List the current products
  3) Display average product unit cost
  4) Display cheapest product
  5) List products that are more expensive than a given price
  0) Exit
==>> 4
The cheapest product is:  Product 2

Press any key to continue...
```

Option 4:

Display cheapest product

Shop V2.2 – Control with menu

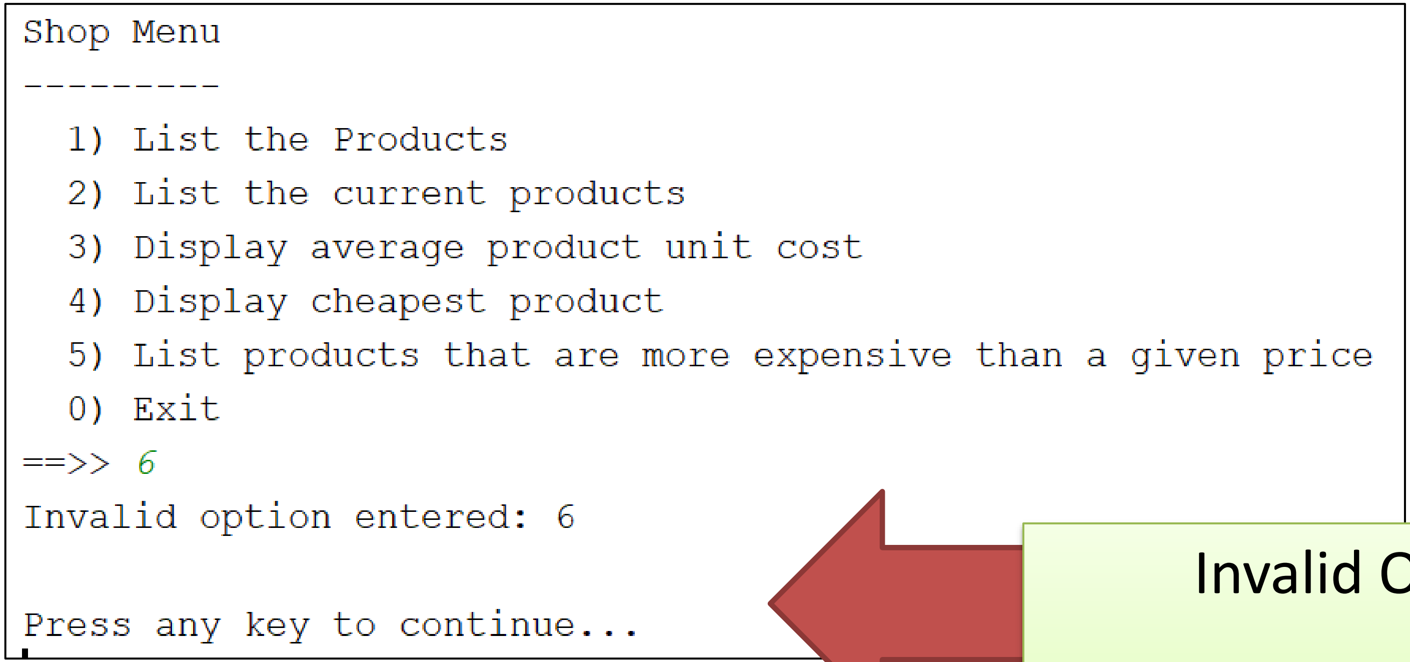


```
Shop Menu
---------
  1) List the Products
  2) List the current products
  3) Display average product unit cost
  4) Display cheapest product
  5) List products that are more expensive than a given price
  0) Exit
==>> 5
View the product costing more than this price:  15
2: Product description: Product 3, product code: 6745, unit cost: 49.99, currently in product line: true


Press any key to continue...
```

Option 5:

List products that are more expensive than a given price

Shop V2.2 – Control with menu

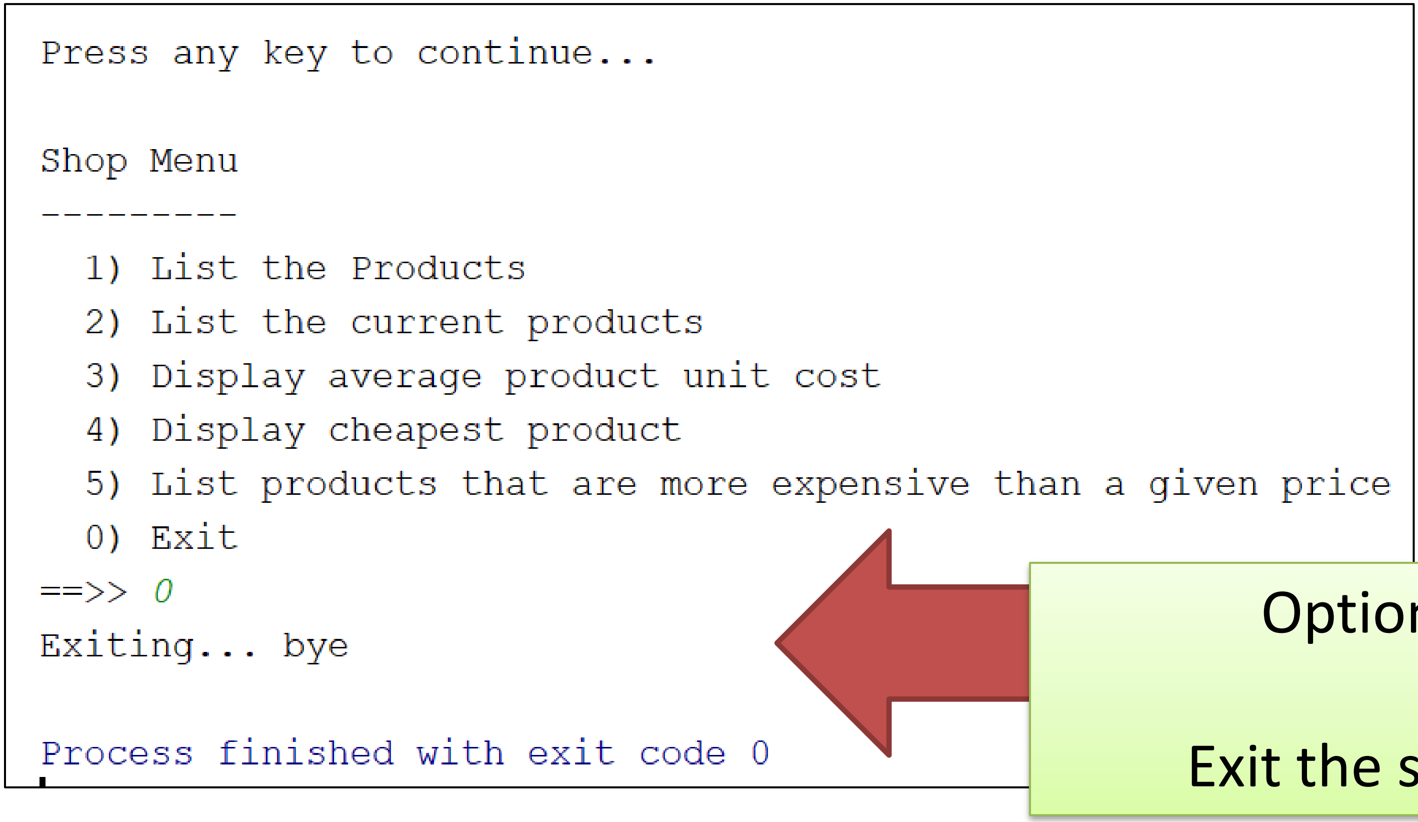


```
Shop Menu
---------
  1) List the Products
  2) List the current products
  3) Display average product unit cost
  4) Display cheapest product
  5) List products that are more expensive than a given price
  0) Exit
==>> 6
Invalid option entered: 6

Press any key to continue...
```

Invalid Option

Menu is redisplayed once you press the enter key.

Shop V2.2 – Control with menu



```
Press any key to continue...

Shop Menu
---------
   1) List the Products
   2) List the current products
   3) Display average product unit cost
   4) Display cheapest product
   5) List products that are more expensive than a given price
   0) Exit
==>> 0
Exiting... bye

Process finished with exit code 0
```

Option 0:

Exit the system

switch Statement

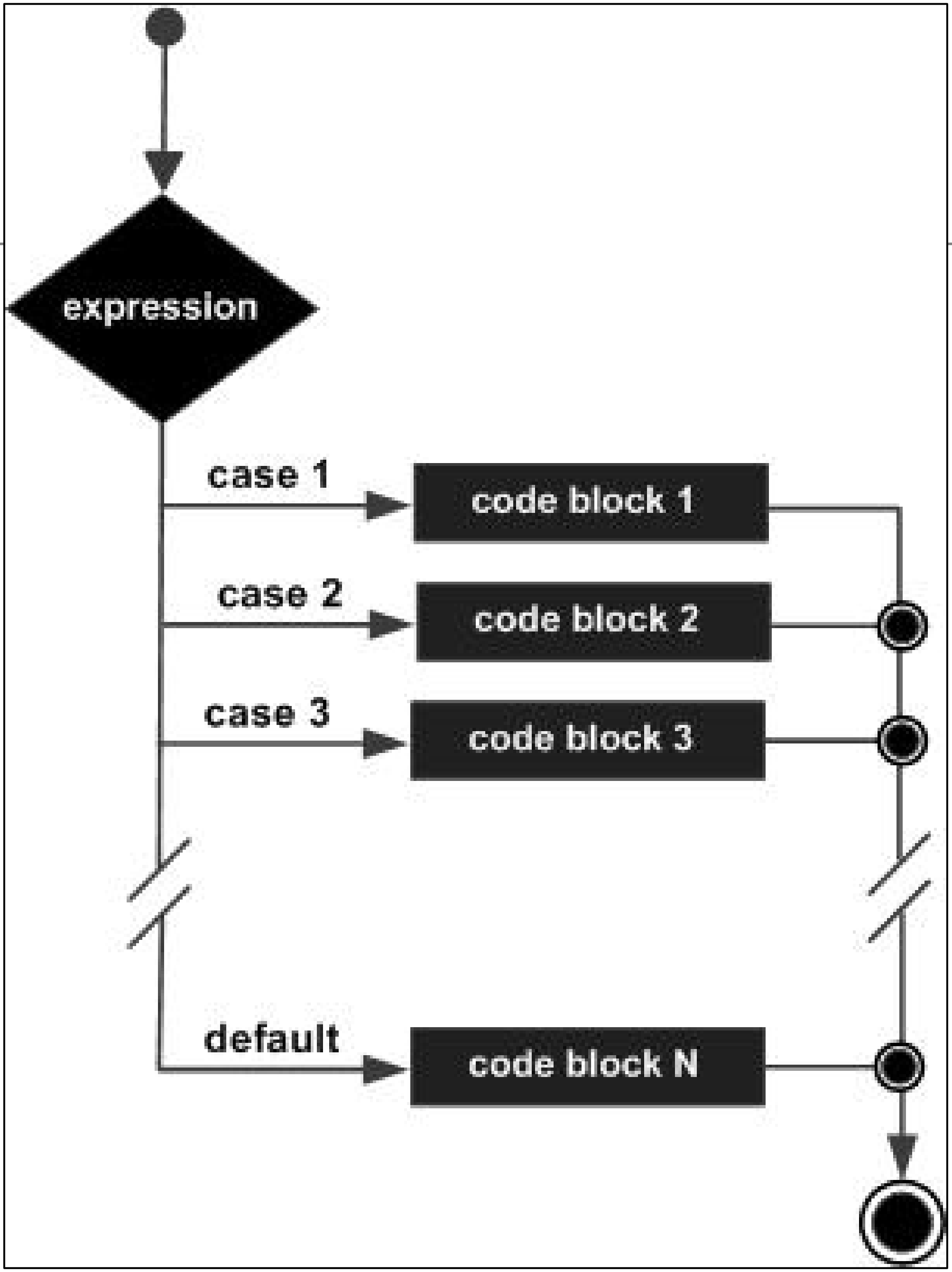
A brief introduction (more later!)

The **switch** statement

- The switch statement works in exactly the same way as a **set of if** statements, but is more compact and readable.

- The *switch statement* switches on a single **value** to one of an arbitrary number of **cases**.

The **switch** statement



The switch statement

- A *switch* statement can have any number of **case** labels.
- The **default** case is optional; if no default is given, it may happen that no case is executed.
- Can *switch* on **int**, **char** or **String**.

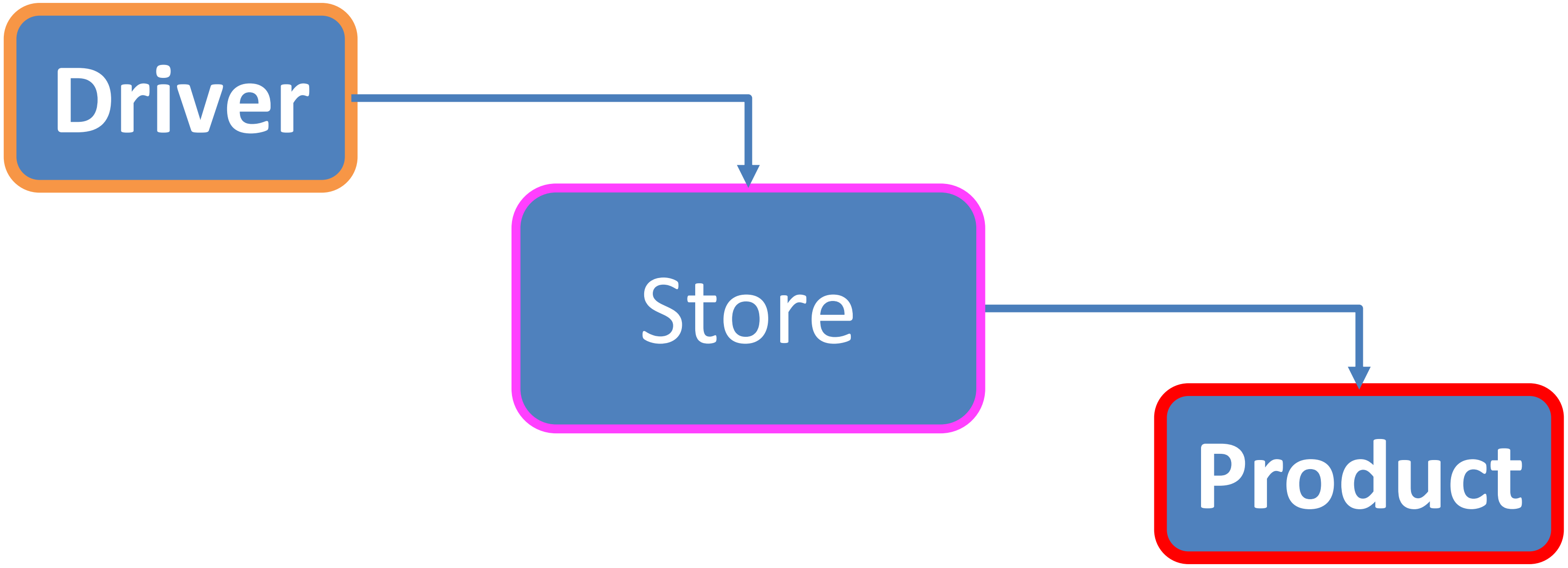
- Let’s use this now in ShopV2.2

Shop V2.2

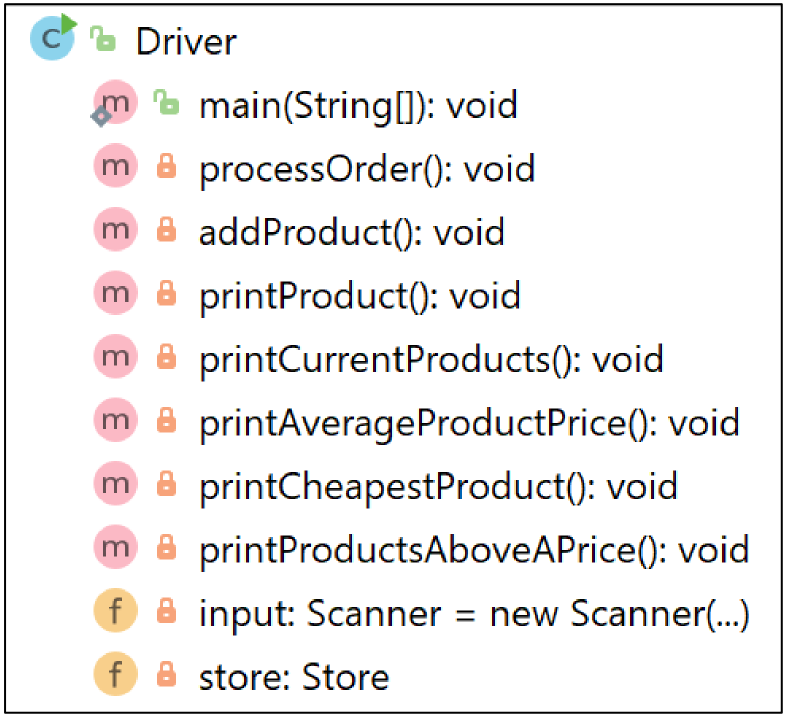
Incorporating a menu

Shop V2.2

- **Product** – no changes
- **Store** – no changes
- **Driver** will be changed to allow the user to choose options from a menu.



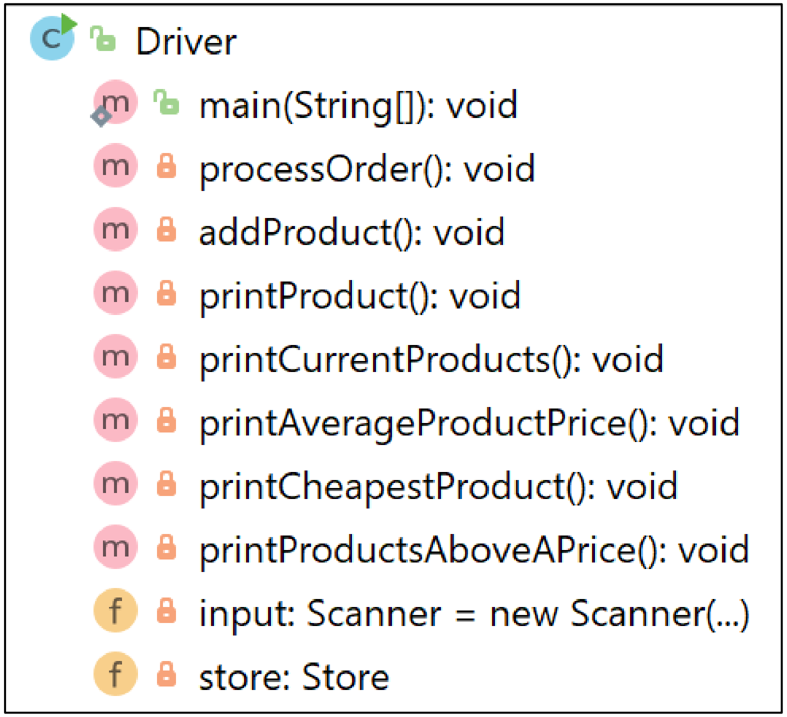
Shop V2.1 Shop V2.2



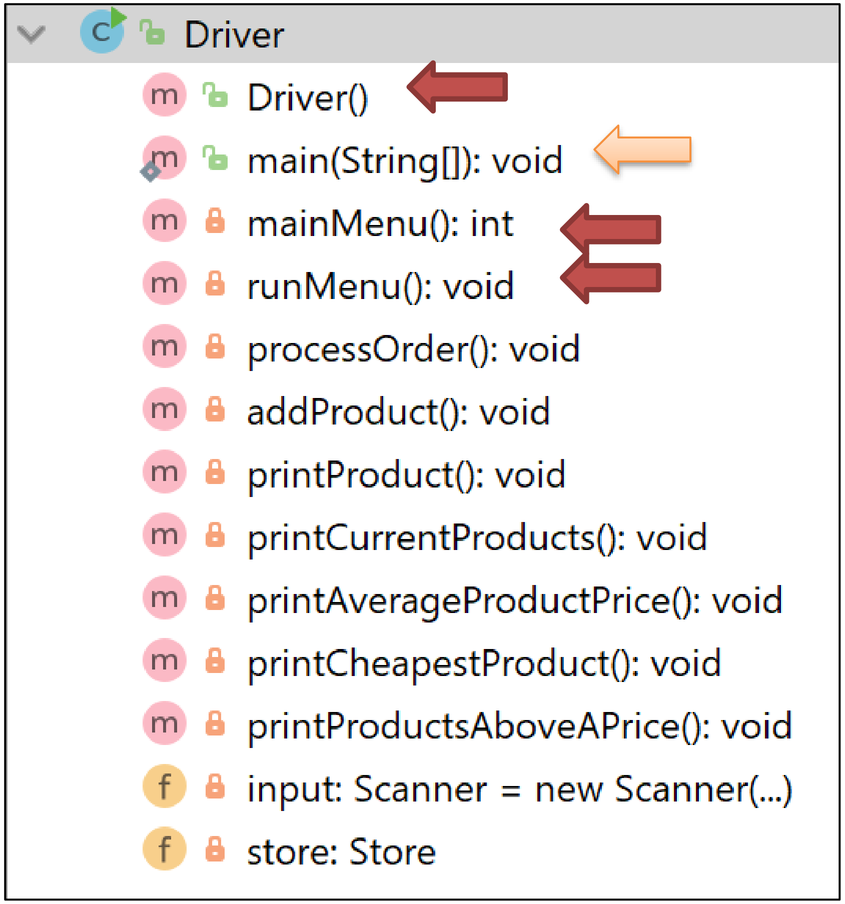
Driver

- main(String[]): void
- processOrder(): void
- addProduct(): void
- printProduct(): void
- printCurrentProducts(): void
- printAverageProductPrice(): void
- printCheapestProduct(): void
- printProductsAboveAPrice(): void
- input: Scanner = new Scanner(...)
- store: Store

Shop V2.1 Shop V2.2

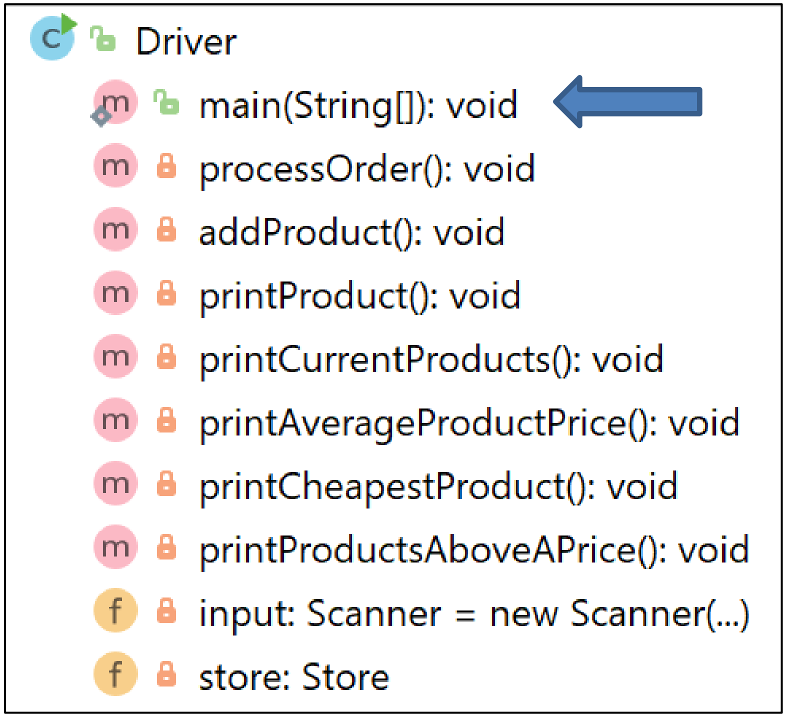


Driver
main(String[]): void
processOrder(): void
addProduct(): void
printProduct(): void
printCurrentProducts(): void
printAverageProductPrice(): void
printCheapestProduct(): void
printProductsAboveAPrice(): void
input: Scanner = new Scanner(...)
store: Store



Driver
Driver()
main(String[]): void
mainMenu(): int
runMenu(): void
processOrder(): void
addProduct(): void
printProduct(): void
printCurrentProducts(): void
printAverageProductPrice(): void
printCheapestProduct(): void
printProductsAboveAPrice(): void
input: Scanner = new Scanner(...)
store: Store

Shop V2.1 – main method

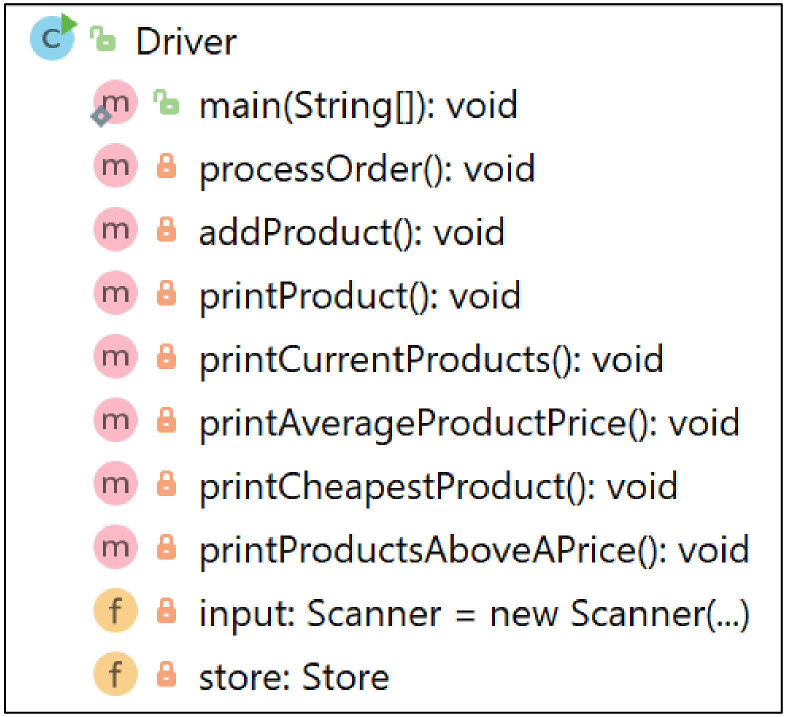


```
Driver
    main(String[]): void
    processOrder(): void
    addProduct(): void
    printProduct(): void
    printCurrentProducts(): void
    printAverageProductPrice(): void
    printCheapestProduct(): void
    printProductsAboveAPrice(): void
    input: Scanner = new Scanner(...)
    store: Store
```

```java
public static void main(String[] args) {
    Driver driver = new Driver();
    driver.processOrder();
    driver.printProducts();
    driver.printCurrentProducts();
    driver.printAverageProductPrice();
    driver.printCheapestProduct();
    driver.printProductsAboveAPrice();
}
```

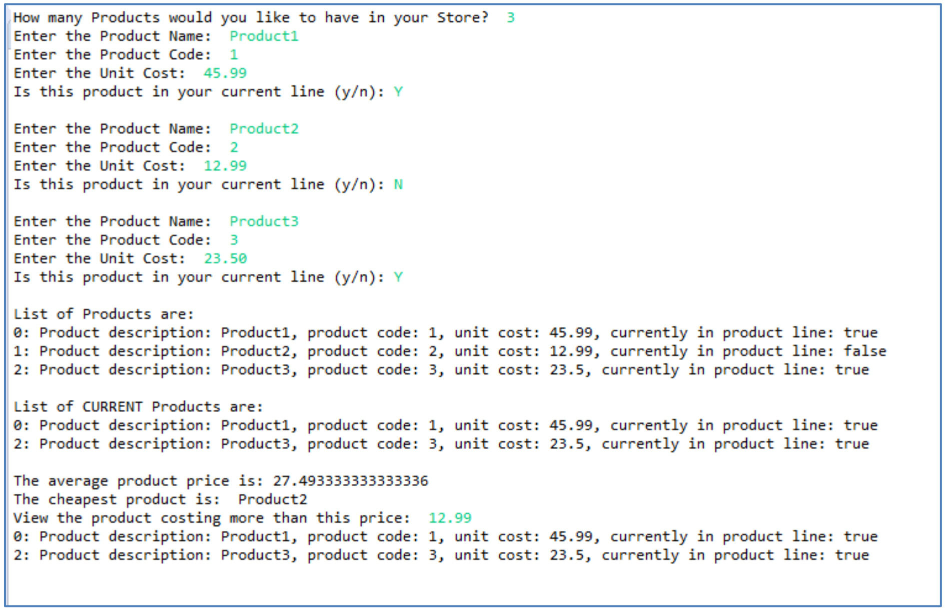
Shop V2.1 – main method

```
public static void main(String[] args) {
    Driver driver = new Driver();
    driver.processOrder();
    driver.printProducts();
    driver.printCurrentProducts();
    driver.printAverageProductPrice();
    driver.printCheapestProduct();
    driver.printProductsAboveAPrice();
}
```



```
C Driver
    m main(String[]): void
    m processOrder(): void
    m addProduct(): void
    m printProduct(): void
    m printCurrentProducts(): void
    m printAverageProductPrice(): void
    m printCheapestProduct(): void
    m printProductsAboveAPrice(): void
    f input: Scanner = new Scanner(...)
    f store: Store
```

Console Output



```
How many Products would you like to have in your Store?  3
Enter the Product Name:  Product1
Enter the Product Code:  1
Enter the Unit Cost:  45.99
Is this product in your current line (y/n): Y

Enter the Product Name:  Product2
Enter the Product Code:  2
Enter the Unit Cost:  12.99
Is this product in your current line (y/n): N

Enter the Product Name:  Product3
Enter the Product Code:  3
Enter the Unit Cost:  23.50
Is this product in your current line (y/n): Y

List of Products are:
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
1: Product description: Product2, product code: 2, unit cost: 12.99, currently in product line: false
2: Product description: Product3, product code: 3, unit cost: 23.5, currently in product line: true

List of CURRENT Products are:
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
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The average product price is: 27.493333333333336
The cheapest product is:  Product2
View the product costing more than this price:  12.99
0: Product description: Product1, product code: 1, unit cost: 45.99, currently in product line: true
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```
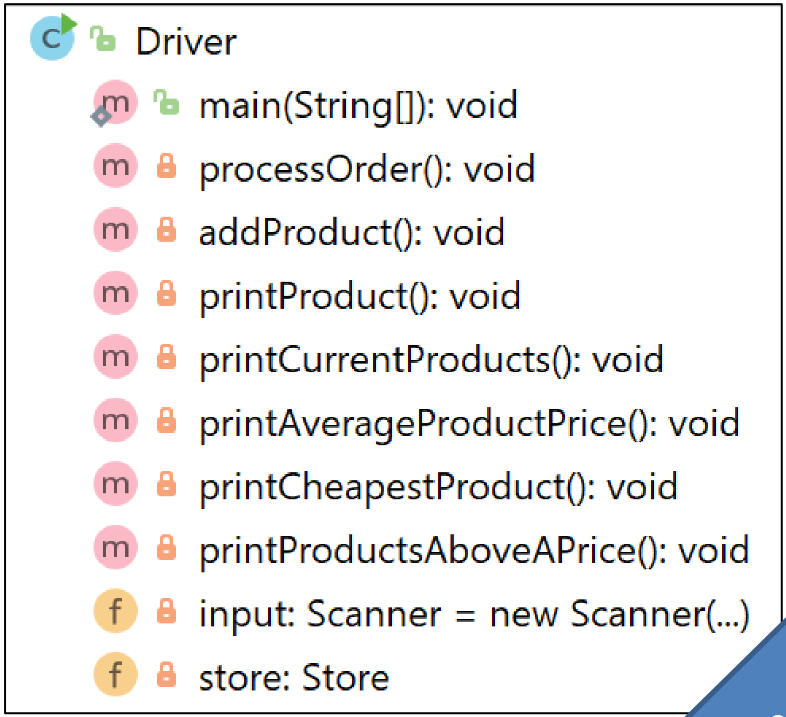

Shop V2.1 – main method

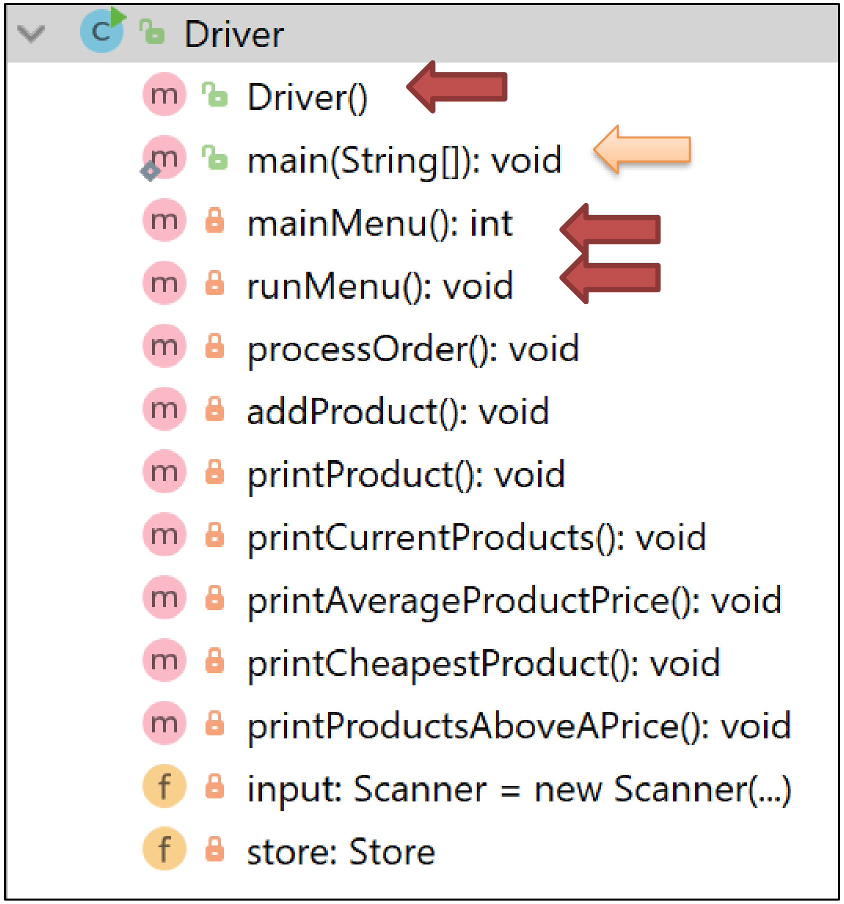


```
Driver
    main(String[]): void
    processOrder(): void
    addProduct(): void
    printProduct(): void
    printCurrentProducts(): void
    printAverageProductPrice(): void
    printCheapestProduct(): void
    printProductsAboveAPrice(): void
    input: Scanner = new Scanner(...)
    store: Store
```

```java
public static void main(String[] args) {
    Driver driver = new Driver();
    driver.processOrder();
    driver.printProducts();
    driver.printCurrentProducts();
    driver.printAverageProductPrice();
    driver.printCheapestProduct();
    driver.printProductsAboveAPrice();
}
```

These methods will be in a menu system in **V2.2**

```
public Driver() {
    processOrder();
    runMenu();
}

public static void main(String[] args) {
    new Driver();
}
```



Driver
- Driver()
- main(String[]): void
- mainMenu(): int
- runMenu(): void
- processOrder(): void
- addProduct(): void
- printProduct(): void
- printCurrentProducts(): void
- printAverageProductPrice(): void
- printCheapestProduct(): void
- printProductsAboveAPrice(): void
- input: Scanner = new Scanner(...)
- store: Store

Shop V2.2:

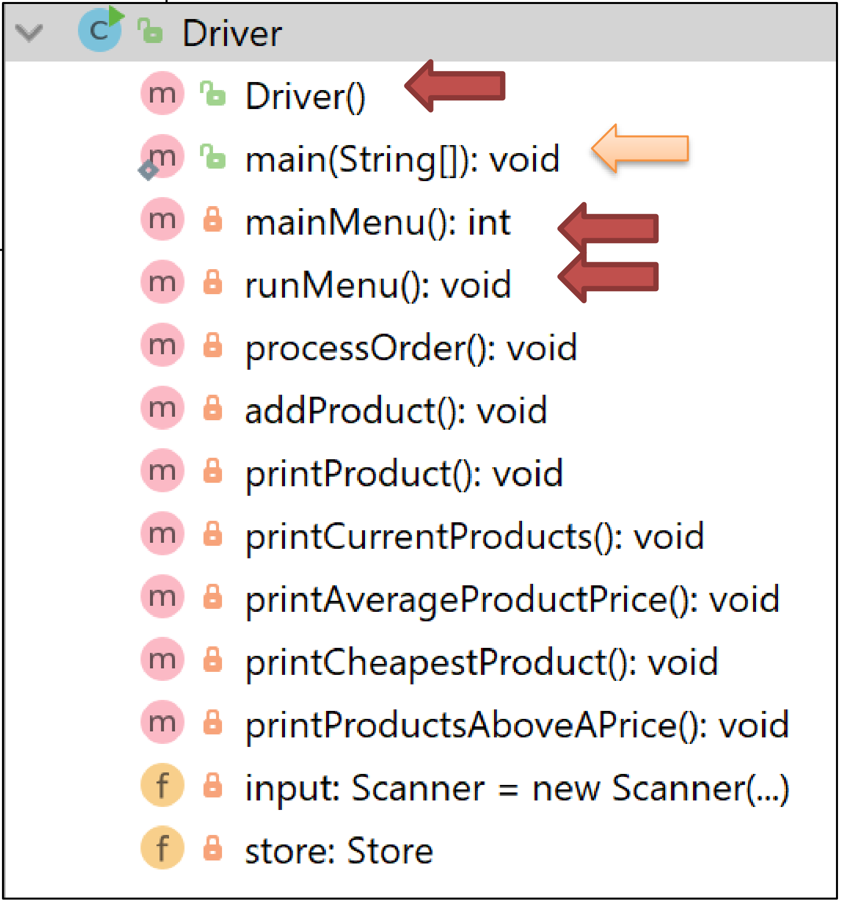
- new Driver constructor
- changes to the main method

1

Shop V2.2 – new ***mainMenu*** method

2

```
private int mainMenu(){
   System.out.print("""
         Shop Menu
         ---------
           1) List the Products
           2) List the current products
           3) Display average product unit cost
           4) Display cheapest product
           5) List products that are more expensive than a given price
           0) Exit
         ==>> """);
   int option = input.nextInt();
   return option;
}
```



Driver
- Driver()
- main(String[]): void
- mainMenu(): int
- runMenu(): void
- processOrder(): void
- addProduct(): void
- printProduct(): void
- printCurrentProducts(): void
- printAverageProductPrice(): void
- printCheapestProduct(): void
- printProductsAboveAPrice(): void
- input: Scanner = new Scanner(...)
- store: Store

V2.2

```
private void runMenu(){
   int option = mainMenu();

   while (option != 0){
      switch (option){
         case 1 -> printProducts();
         case 2 -> printCurrentProducts();
         case 3 -> printAverageProductPrice();
         case 4 -> printCheapestProduct();
         case 5 -> printProductsAboveAPrice();
         default -> System.out.println("Invalid option entered: " + option);
      }

      //pause the program so that the user can read what we just printed to the terminal window
      System.out.println("\nPress enter key to continue...");
      input.nextLine();
      input.nextLine(); //second read is required - bug in Scanner class; a String read is ignored straight after reading an int.

      //display the main menu again
      option = mainMenu();
   }

   //the user chose option 0, so exit the program
   System.out.println("Exiting...bye");
   System.exit(0);
}
```

3

Shop V2.2 – new **runMenu** method

V2.2

```java
private void runMenu(){
    int option = mainMenu();

    while (option != 0){
        switch (option){
            case 1 -> printProducts();
            case 2 -> printCurrentProducts();
            case 3 -> printAverageProductPrice();
            case 4 -> printCheapestProduct();
            case 5 -> printProductsAboveAPrice();
            default -> System.out.println("Invalid option entered: " + option);
        }

        //pause the program so that the user can read what we just printed to the terminal window
        System.out.println("\nPress enter key to continue...");
        input.nextLine();
        input.nextLine(); //second read is required - bug in Scanner class; a String read is ignored straight after reading an int.

        //display the main menu again
        option = mainMenu();
    }

    //the user chose option 0, so exit the program
    System.out.println("Exiting...bye");
    System.exit(0);
}
```

LCV initialised

LCV tested

LCV changed

Loop Control Variable is **option**

V2.2

```java
private void runMenu(){
    int option = mainMenu();

    while (option != 0){
        switch (option){
            case 1 -> printProducts();
            case 2 -> printCurrentProducts();
            case 3 -> printAverageProductPrice();
            case 4 -> printCheapestProduct();
            case 5 -> printProductsAboveAPrice();
            default -> System.out.println("Invalid option entered: " + option);
        }

        //pause the program so that the user can read what we just printed to the terminal window
        System.out.println("\nPress enter key to continue...");
        input.nextLine();
        input.nextLine(); //second read is required - bug in Scanner class; a String read is ignored straight after reading an int.

        //display the main menu again
        option = mainMenu();
    }

    //the user chose option 0, so exit the program
    System.out.println("Exiting...bye");
    System.exit(0);
}
```

```java
public static void main(String[] args) {
    Driver driver = new Driver();
    driver.processOrder();
    driver.printProducts();
    driver.printCurrentProducts();
    driver.printAverageProductPrice();
    driver.printCheapestProduct();
    driver.printProductsAboveAPrice();
}
```

V2.1

Note the methods in the switch statement are those that were in the main method in V2.1

Menus and switch statement

- We will be revisiting this content in the next week or so!

Questions?