# Programming Fundamentals 1

Produced by

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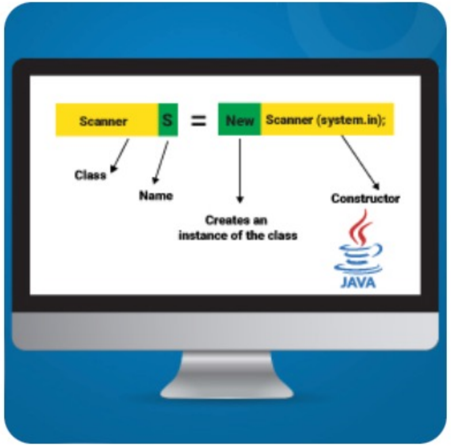
# Input / Output

The Scanner class

## Scanner IO



Scanner · Console I/O

# Agenda

- ❑ The `Scanner` class

- ❑ RECAP :
  - SHOP Version 1.0
  - `Product` Class
  - `Driver` Class

- ❑ Input / Output in SHOP

# The Scanner Class

# Input in Java: the **Scanner** Class

- ❑ The **Scanner** class is part of Java

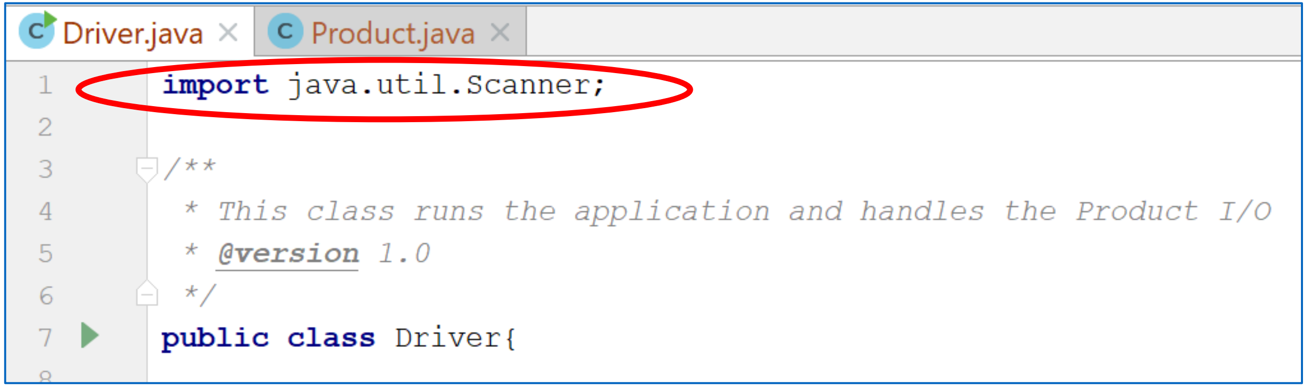
- ❑ It allows us to **take in data from the console** / terminal window

- ❑ It is part of the **`java.util`** package in the Java Application Programming Interfaces (APIs)

# Input in Java: the **Scanner** Class

- ❑ In order to use the Scanner class, place the following line as the **first line of code in your file** (i.e. before class declaration):

```
import java.util.Scanner;
```

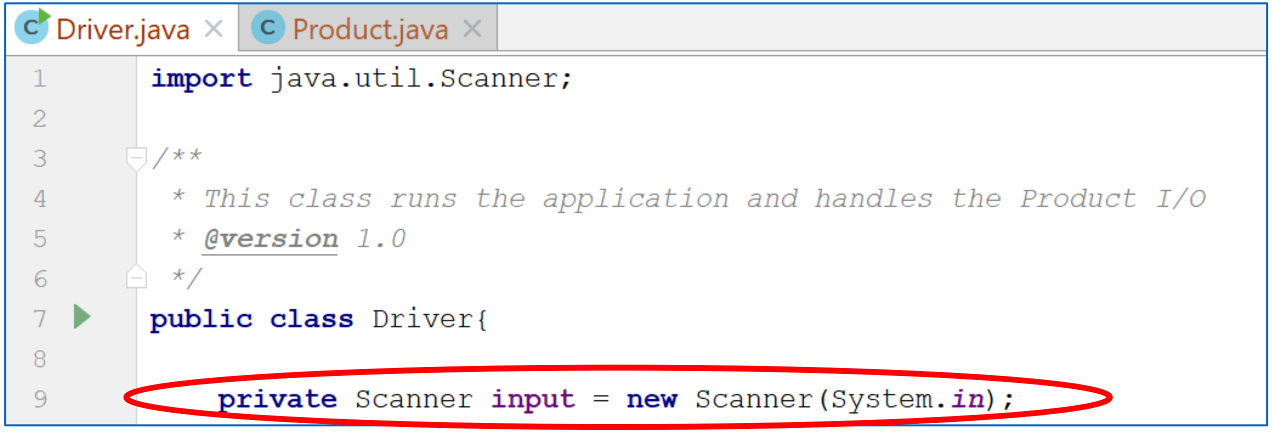


```
import java.util.Scanner;

/**
 * This class runs the application and handles the Product I/O
 * @version 1.0
 */
public class Driver{
```

# Input in Java: the **Scanner** Class

- ❑ Having imported the **util** package, you will need to write the following instruction in your program.

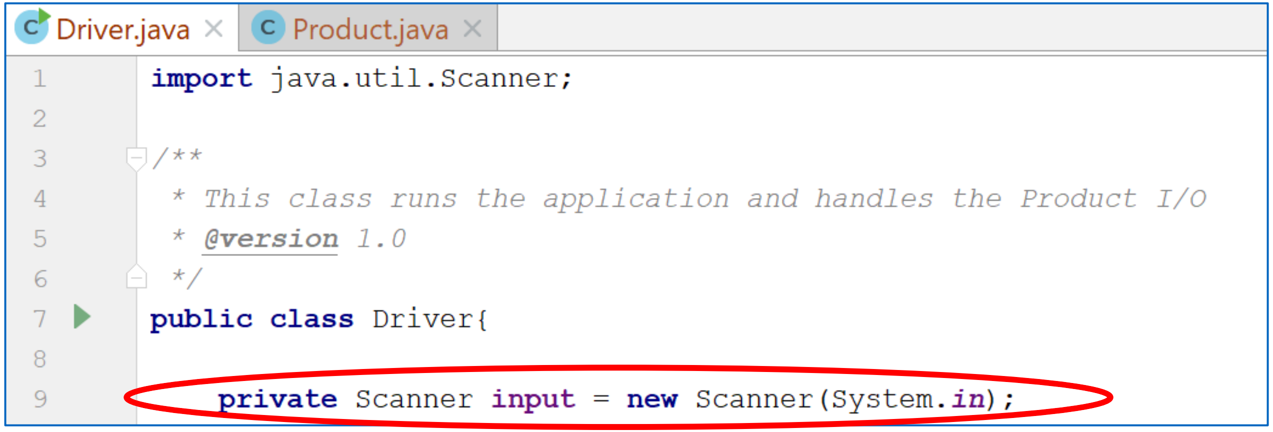
```
Scanner input = new Scanner(System.in);
```



```
import java.util.Scanner;

/**
 * This class runs the application and handles the Product I/O
 * @version 1.0
 */
public class Driver{

    private Scanner input = new Scanner(System.in);
```

# Input in Java: the **Scanner** Class

- This declares a Scanner **object** called input (you can name this object anything you wish).
- You must have this instruction to be able to call the methods in the Scanner class.



```java
import java.util.Scanner;

/**
 * This class runs the application and handles the Product I/O
 * @version 1.0
 */
public class Driver{

    private Scanner input = new Scanner(System.in);
```

# Input in Java: the **Scanner** Class

❑ Now that a Scanner object is set up, we can use all the **input methods** that have been defined in the Scanner class.

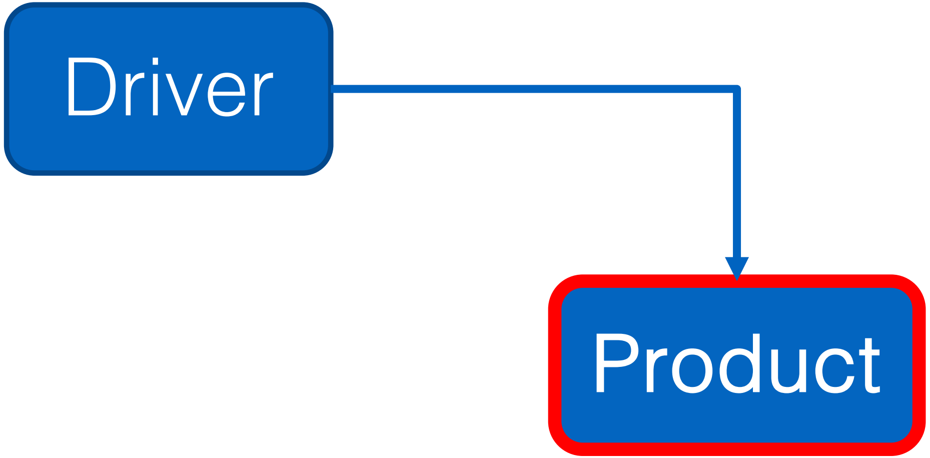
❑ There are **methods** to take in:

| | |
|---|---|
| ints | .nextInt() |
| doubles | .nextDouble() |
| Strings | .nextLine() |
| chars | .next().charAt(0) |
| etc… | See API docs for more |

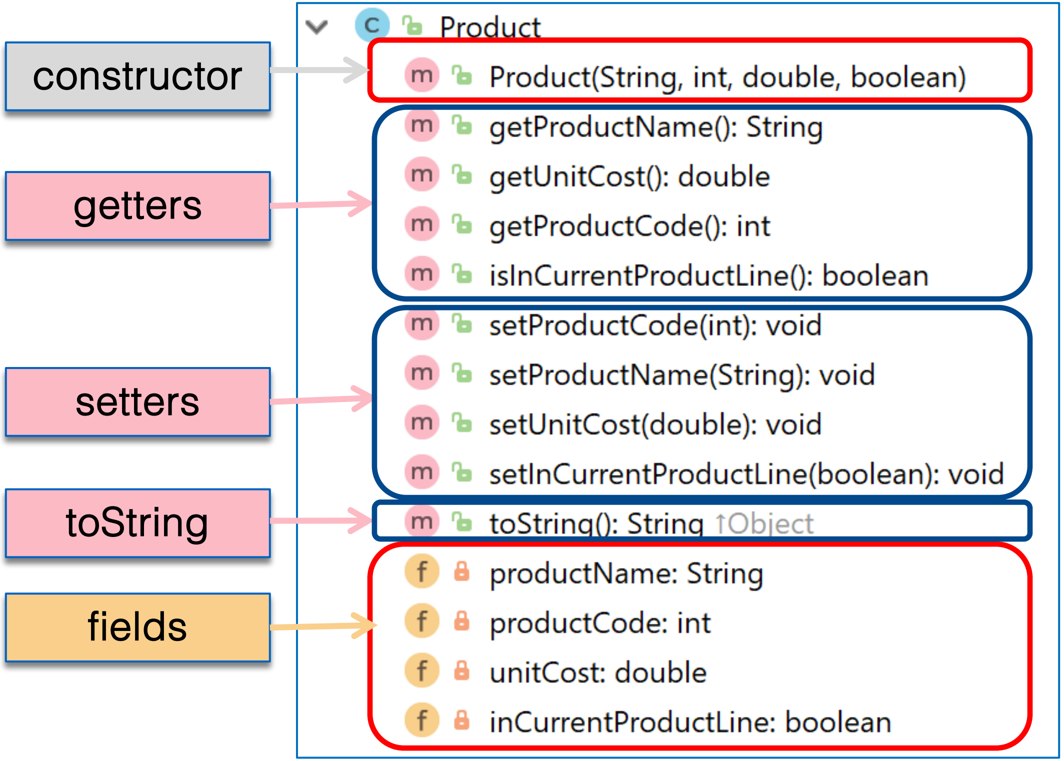
# RECAP : SHOP V1.0

# Shop V1.0 - Product

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



# RECAP : Shop V1.0 - Product



constructor

getters

setters

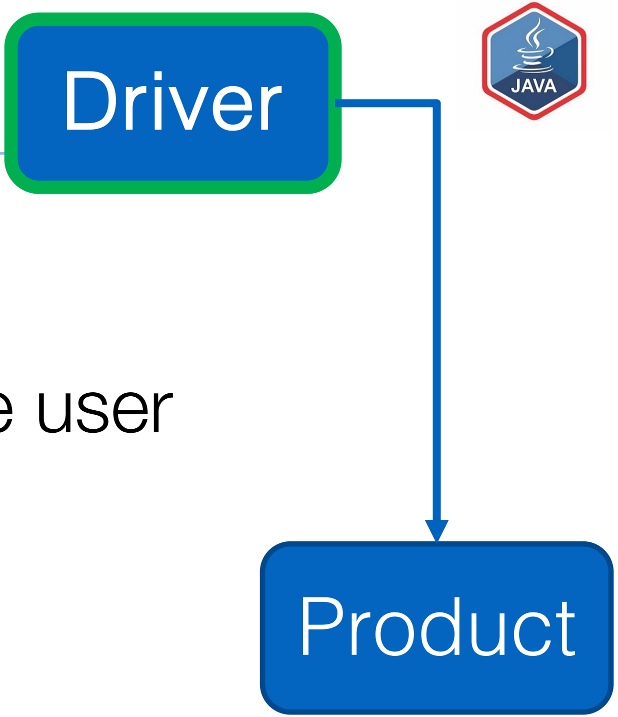
toString

fields

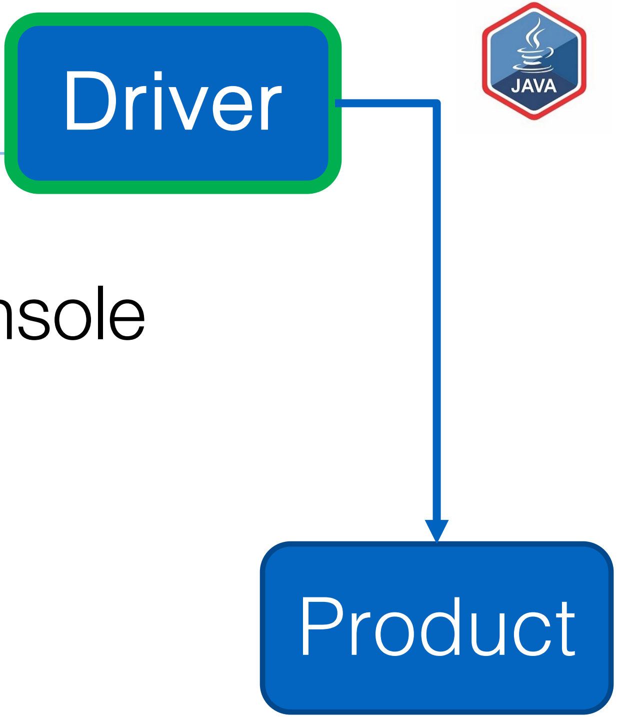
```
Product
    Product(String, int, double, boolean)
    getProductName(): String
    getUnitCost(): double
    getProductCode(): int
    isInCurrentProductLine(): boolean
    setProductCode(int): void
    setProductName(String): void
    setUnitCost(double): void
    setInCurrentProductLine(boolean): void
    toString(): String ↑Object
    productName: String
    productCode: int
    unitCost: double
    inCurrentProductLine: boolean
```

# 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 V1.0 - Driver

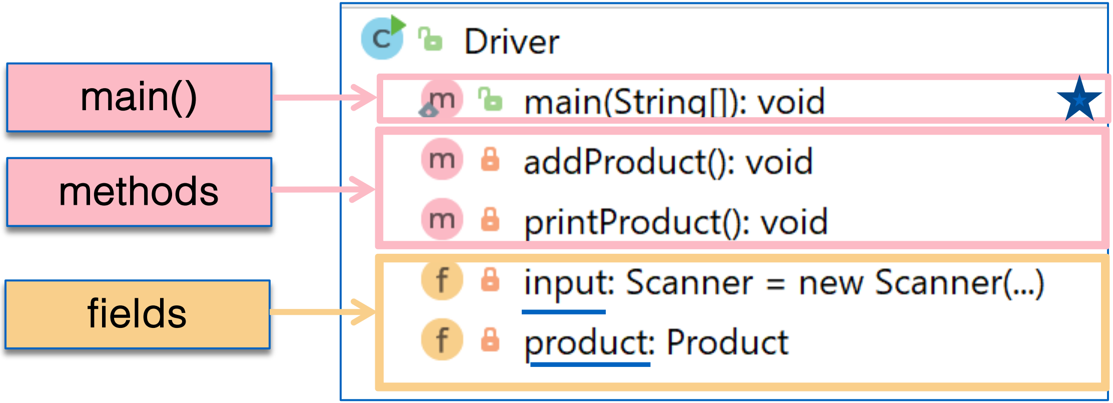


□We want to use **Scanner** to read in product details from the console

□We will then **store** these details in a Product object

□**And then print** these details back to the console

# Shop V1.0 - Driver



main()

methods

fields

Driver

main(String[]): void

addProduct(): void

printProduct(): void

input: Scanner = new Scanner(...)

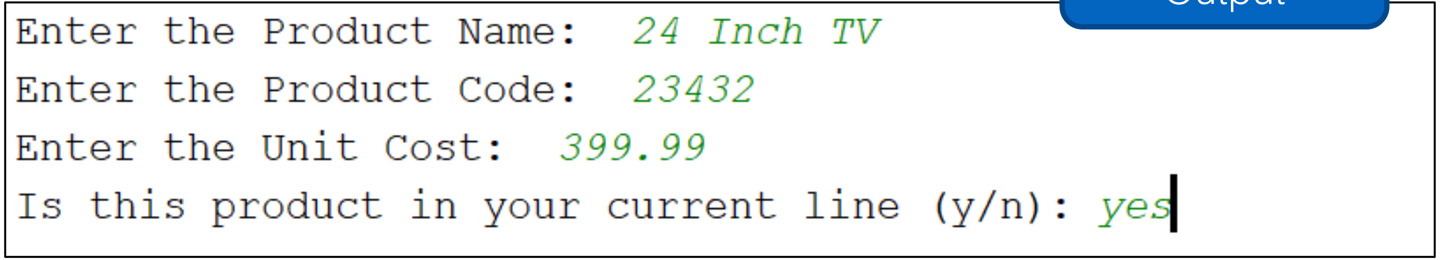
product: Product

# I/O in SHOP V1.0

# What the program will look like…

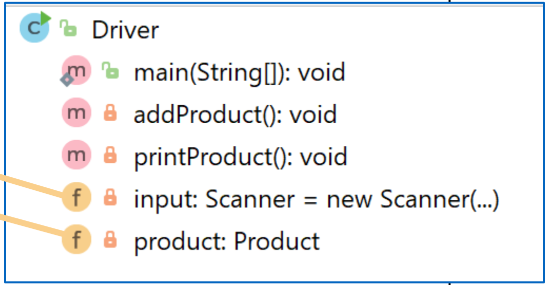
Console Output

String
int
double
boolean

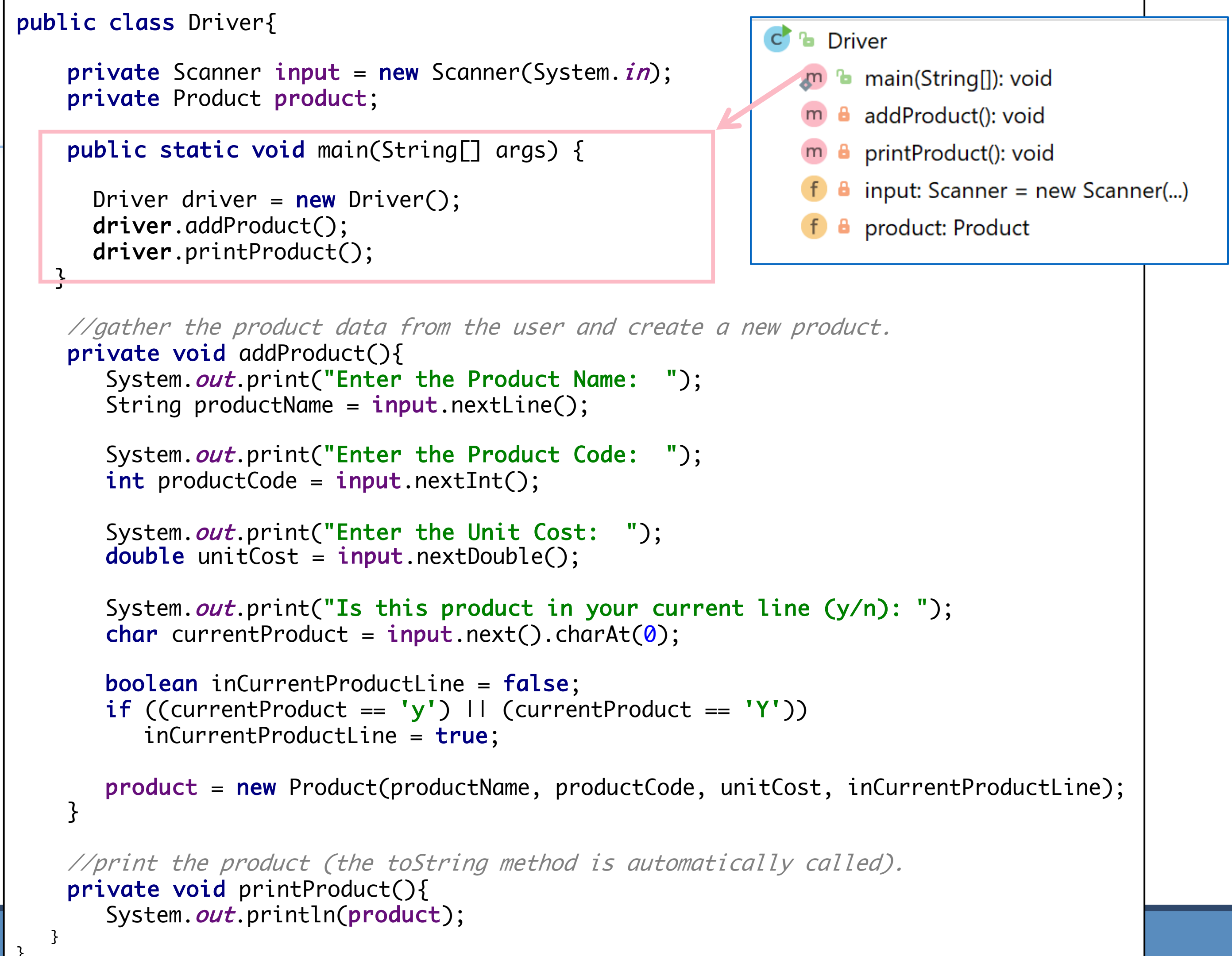


```
Enter the Product Name:   24 Inch TV
Enter the Product Code:   23432
Enter the Unit Cost:   399.99
Is this product in your current line (y/n): yes
```

```java
public class Driver{

    private Scanner input = new Scanner(System.in);
    private Product product;

    public static void main(String[] args) {

      Driver driver = new Driver();
      driver.addProduct();
      driver.printProduct();
   }

    //gather the product data from the user and create a new product.
    private void addProduct(){
       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();

       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;

       product = new Product(productName, productCode, unitCost, inCurrentProductLine);
    }

    //print the product (the toString method is automatically called).
    private void printProduct(){
       System.out.println(product);
   }
}
```



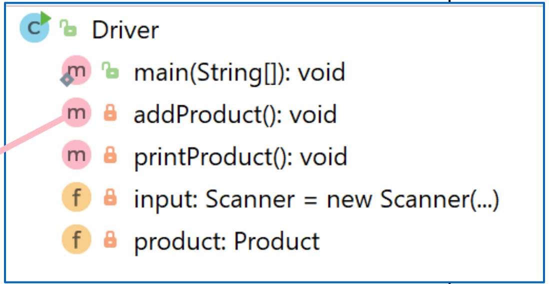
```
Driver
   main(String[]): void
   addProduct(): void
   printProduct(): void
   input: Scanner = new Scanner(...)
   product: Product
```



```java
public class Driver{

    private Scanner input = new Scanner(System.in);
    private Product product;

    public static void main(String[] args) {

        Driver driver = new Driver();
        driver.addProduct();
        driver.printProduct();
    }

    //gather the product data from the user and create a new product.
    private void addProduct(){
        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();

        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;

        product = new Product(productName, productCode, unitCost, inCurrentProductLine);
    }

    //print the product (the toString method is automatically called).
    private void printProduct(){
        System.out.println(product);
    }
}
```

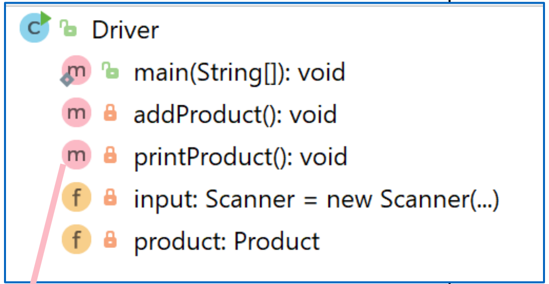
```
Driver
    main(String[]): void
    addProduct(): void
    printProduct(): void
    input: Scanner = new Scanner(...)
    product: Product
```

```java
public class Driver{

    private Scanner input = new Scanner(System.in);
    private Product product;

    public static void main(String[] args) {

      Driver driver = new Driver();
      driver.addProduct();
      driver.printProduct();
   }

    //gather the product data from the user and create a new product.
    private void addProduct(){
       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();

       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;

       product = new Product(productName, productCode, unitCost, inCurrentProductLine);
    }

    //print the product (the toString method is automatically called).
    private void printProduct(){
       System.out.println(product);
   }
}
```



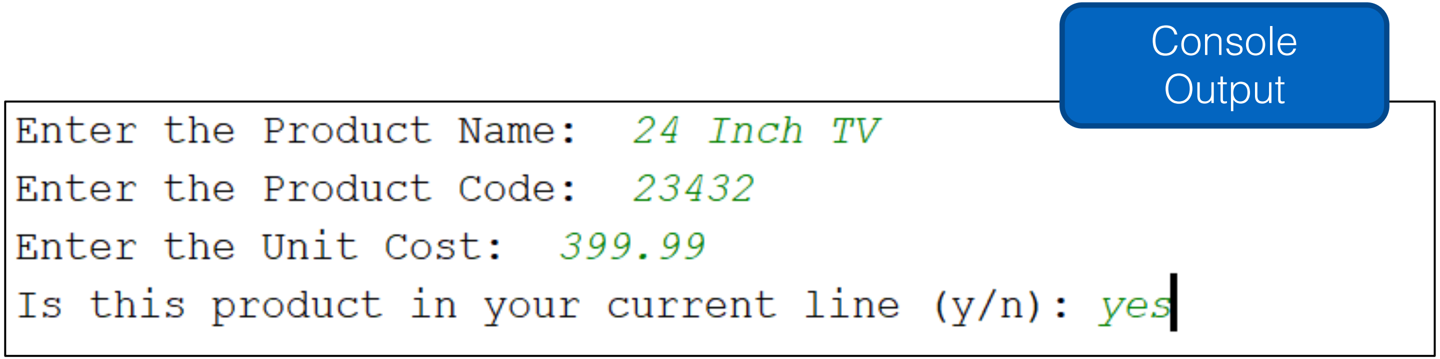
```
Driver
    main(String[]): void
    addProduct(): void
    printProduct(): void
    input: Scanner = new Scanner(...)
    product: Product
```

```java
public class Driver{

    private Scanner input = new Scanner(System.in);
    private Product product;

    public static void main(String[] args) {

      Driver driver = new Driver();
      driver.addProduct();
      driver.printProduct();
   }

    //gather the product data from the user and create a new product.
    private void addProduct(){
       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();

       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;

       product = new Product(productName, productCode, unitCost, inCurrentProductLine);
    }

    //print the product (the toString method is automatically called).
    private void printProduct(){
       System.out.println(product);
   }
}
```



Driver
- main(String[]): void
- addProduct(): void
- printProduct(): void
- input: Scanner = new Scanner(...)
- product: Product

# The addProduct() console output…



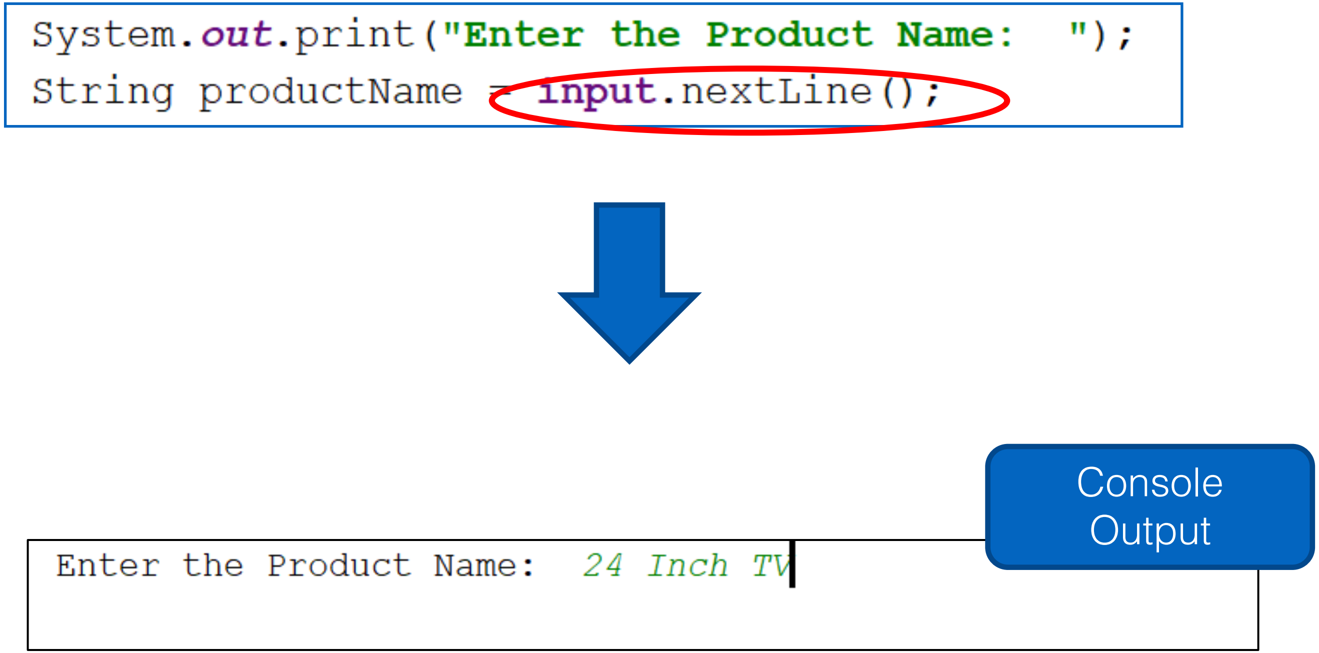
Console Output

String
int
double
boolean

```
Enter the Product Name:   24 Inch TV
Enter the Product Code:   23432
Enter the Unit Cost:   399.99
Is this product in your current line (y/n): yes
```

Now, Let’s Look at how this is done…

# ShopV1.0 – read Product Name (String)

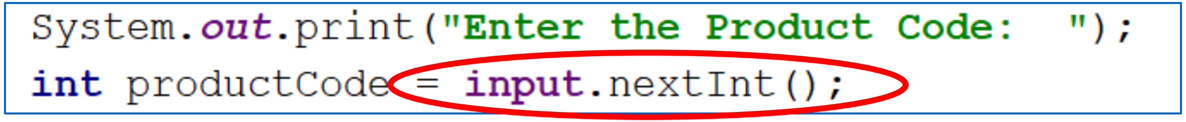


```
System.out.print("Enter the Product Name:   ");
String productName = input.nextLine();
```

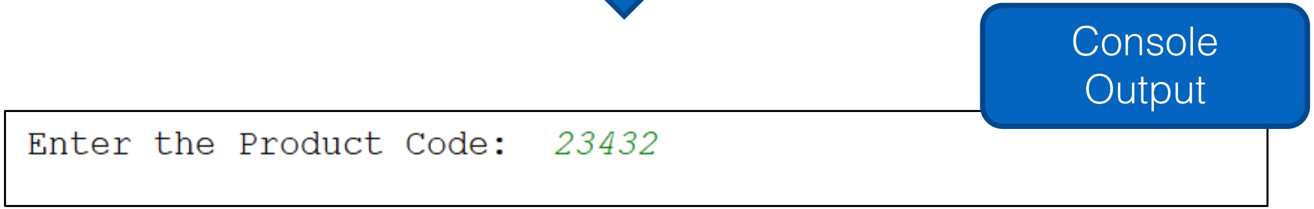
```
Enter the Product Name:   24 Inch TV
```

Console Output

# ShopV1.0 – read Product Code (int)



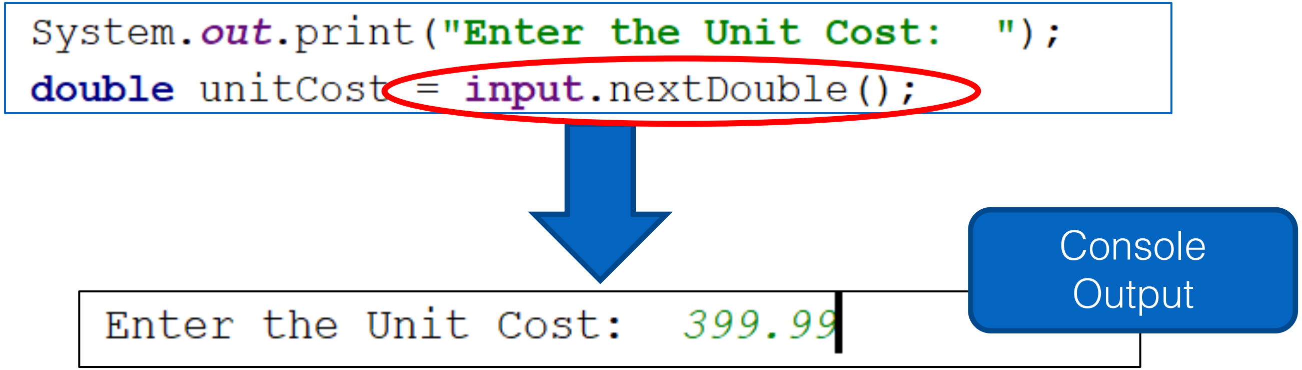
```
System.out.print("Enter the Product Code:   ");
int productCode = input.nextInt();
```



Console Output

```
Enter the Product Code:   23432
```

# ShopV1.0 – read Unit Cost (double)

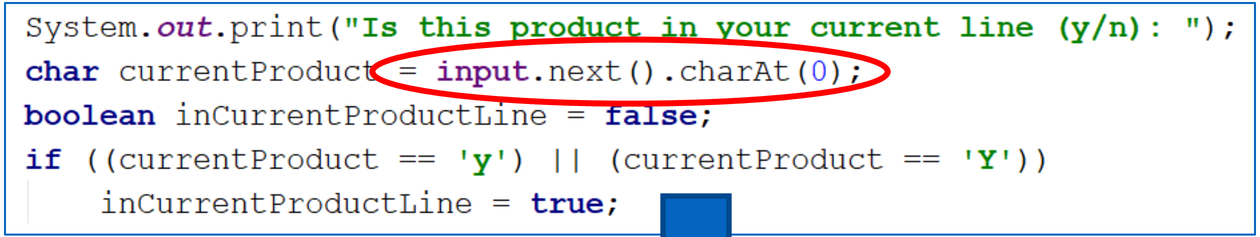


```
System.out.print("Enter the Unit Cost:  ");
double unitCost = input.nextDouble();
```

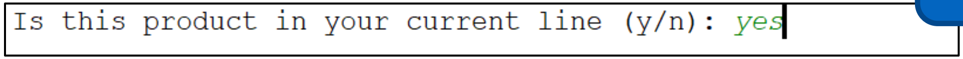
```
Enter the Unit Cost:  399.99
```

# ShopV1.0 – In Current Product Line? (**boolean**)

For **booleans**, take in a **char**acter first, then test it



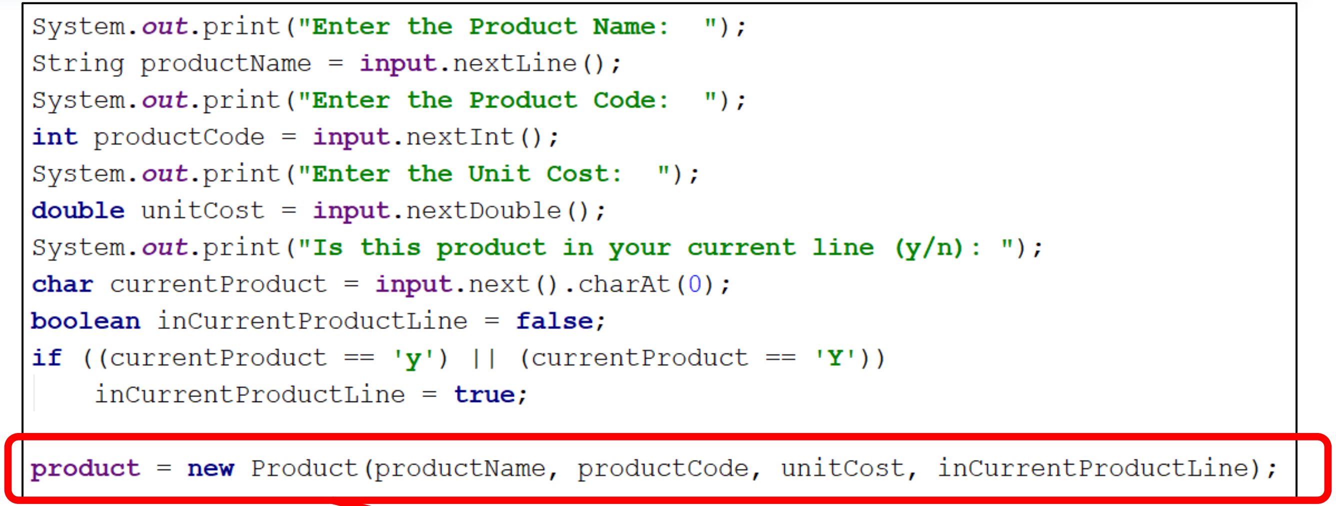
```
System.out.print("Is this product in your current line (y/n): ");
char currentProduct = input.next().charAt(0);
boolean inCurrentProductLine = false;
if ((currentProduct == 'y') || (currentProduct == 'Y'))
    inCurrentProductLine = true;
```



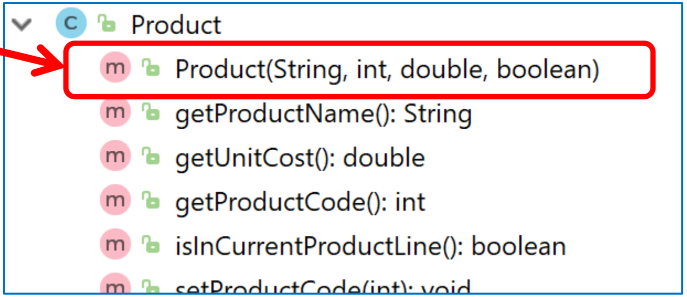
```
Is this product in your current line (y/n): yes
```

Console Output

# ShopV1.0 – Create Product Object



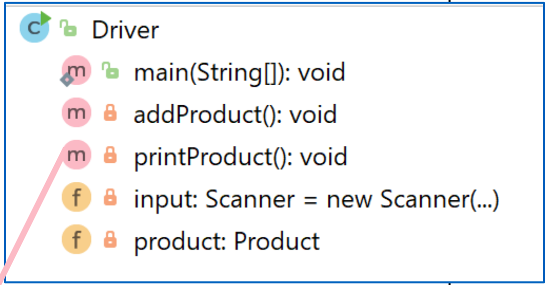
```
System.out.print("Enter the Product Name:  ");
String productName = input.nextLine();
System.out.print("Enter the Product Code:  ");
int productCode = input.nextInt();
System.out.print("Enter the Unit Cost:  ");
double unitCost = input.nextDouble();
System.out.print("Is this product in your current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

product = new Product(productName, productCode, unitCost, inCurrentProductLine);
```



```
Product
    Product(String, int, double, boolean)
    getProductName(): String
    getUnitCost(): double
    getProductCode(): int
    isInCurrentProductLine(): boolean
    setProductCode(int): void
```

Using the values taken in
pass them to the **Product constructor**

```java
public class Driver{

    private Scanner input = new Scanner(System.in);
    private Product product;

    public static void main(String[] args) {

      Driver c = new Driver();
      c.addProduct();
      c.printProduct();
   }

    //gather the product data from the user and create a new product.
    private void addProduct(){
       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();

       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;

       product = new Product(productName, productCode, unitCost, inCurrentProductLine);
    }

    //print the product (the toString method is automatically called).
    private void printProduct(){
       System.out.println(product);
   }
}
```



```
Driver
    main(String[]): void
    addProduct(): void
    printProduct(): void
    input: Scanner = new Scanner(...)
    product: Product
```

# Questions?

Thanks.