

Q1.

Source Code:

```
import java.util.ArrayList;
import java.util.List;

class Product<T> {
    private String name;
    private T price;

    public Product(String name, T price) {
        this.name = name;
        this.price = price;
    }

    public String getName() {
        return name;
    }

    public T getPrice() {
        return price;
    }
}

class Shopkeeper<T> {
    private List<Product<T>> products;

    public Shopkeeper() {
        products = new ArrayList<>();
    }

    public void addProduct(Product<T> product) {
        products.add(product);
        System.out.println("Product added: " +
product.getName());
    }

    public List<Product<T>> getProducts() {
        return products;
    }
}
```

```

}

class Consumer<T> {
    private List<Product<T>> cart;

    public Consumer() {
        cart = new ArrayList<>();
    }

    public void buyProduct(Product<T> product) {
        cart.add(product);
        System.out.println("Product bought: " +
product.getName());
    }

    public List<Product<T>> getCart() {
        return cart;
    }
}

public class ShoppingApp {
    public static void main(String[] args) {
        Shopkeeper<Double> shopkeeper = new Shopkeeper<>();

        Product<Double> product1 = new Product<>("Phone",
999.99);
        Product<Double> product2 = new Product<>("Laptop",
1499.99);
        shopkeeper.addProduct(product1);
        shopkeeper.addProduct(product2);

        Consumer<Double> consumer = new Consumer<>();

        consumer.buyProduct(product1);
        consumer.buyProduct(product2);

        List<Product<Double>> cart = consumer.getCart();

        System.out.println("Products in the cart:");
        for (Product<Double> product : cart) {
            System.out.println(product.getName() + " - rs" +
product.getPrice());

```

```

    }
}
}

```

**Output:**

```

C:\Users\dev\Idea\src\main\java>
Product added: Phone
Product added: Laptop
Product bought: Phone
Product bought: Laptop
Products in the cart:
Phone - rs999.99
Laptop - rs1499.99

```

**Q2.**

**Source Code:**

```

import java.util.ArrayList;
import java.util.Collections;
import java.util.Comparator;
import java.util.List;

class Book {
    private String title;
    private String author;
    private int publicationYear;

    public Book(String title, String author, int
publicationYear) {
        this.title = title;
        this.author = author;
        this.publicationYear = publicationYear;
    }

    public String getTitle() {
        return title;
    }

    public String getAuthor() {
        return author;
    }
}

```

```

        public int getPublicationYear() {
            return publicationYear;
        }
    }

class YearComprator implements Comparator<Book> {
    public int compare(Book b1, Book b2) {
        if (b1.getPublicationYear() == b2.getPublicationYear())
        {
            return 0;
        } else if (b1.getPublicationYear() >
b2.getPublicationYear()) {
            return 1;
        } else
            return -1;
    }
}

public class BookArrayList {
    public static void main(String[] args) {
        List<Book> bookList = new ArrayList<>();

        bookList.add(new Book("Fundamentals of DOS", "kartik
tyagi", 1960));
        bookList.add(new Book("Java", "joseph murino", 1949));
        bookList.add(new Book("Data Mining", "john smith",
1925));

        System.out.println("Books in the list:");
        for (Book book : bookList) {
            System.out.println("Title: " + book.getTitle() + ",
Author: " + book.getAuthor() + ", Publication Year: "
+ book.getPublicationYear());
        }

        Collections.sort(bookList, new YearComprator());

        System.out.println("\nBooks sorted by publication
year:");
        for (Book book : bookList) {
            System.out.println("Title: " + book.getTitle() + ",
Author: " + book.getAuthor() + ", Publication Year: "

```

```
        + book.getPublicationYear());  
    }  
}  
}
```

#### Output:

```
PS C:\Users\devra\Desktop\Java\DA> cd "c:\Users\devra\Desktop\Java\DA\" ; if ($?) {  
● Books in the list:  
Title: Fundamentals of DOS, Author: kartik tyagi, Publication Year: 1960  
Title: Java, Author: joseph murino, Publication Year: 1949  
Title: Data Mining, Author: john smith, Publication Year: 1925  
  
Books sorted by publication year:  
Title: Data Mining, Author: john smith, Publication Year: 1925  
Title: Java, Author: joseph murino, Publication Year: 1949  
Title: Fundamentals of DOS, Author: kartik tyagi, Publication Year: 1960  
}
```