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# Week 1 Hands-on Exercise

# Skill: Design Principles & Patterns

# Exercise 1:

# Implementing the Singleton Pattern

# Code:

class Singleton {

private static Singleton instance;

private Singleton() {

System.out.println("Singleton instance created.");

}

public static Singleton getInstance() {

if (instance == null) {

instance = new Singleton();

}

return instance;

}

}

public class DesignPatternsAndPrinciples1 {

public static void main(String[] args) {

Singleton s1 = Singleton.getInstance();

Singleton s2 = Singleton.getInstance();

System.out.println("Are both instances same? " + (s1 == s2));

}

}

# Output:

A screen shot of a computer

AI-generated content may be incorrect.

# Exercise 2:

#Implementing the Factory Method Pattern

# Code:

interface Product {

void create();

}

class Book implements Product {

public void create() {

System.out.println("Book created.");

}

}

class Pen implements Product {

public void create() {

System.out.println("Pen created.");

}

}

class ProductFactory {

public static Product getProduct(String type) {

if ("book".equalsIgnoreCase(type)) return new Book();

else if ("pen".equalsIgnoreCase(type)) return new Pen();

else return null;

}

}

public class DesignPatternsAndPrinciples2 {

public static void main(String[] args) {

Product p1 = ProductFactory.getProduct("book");

p1.create();

Product p2 = ProductFactory.getProduct("pen");

p2.create();

}

}

# Code:

A screen shot of a computer

AI-generated content may be incorrect.

# Skill : Data Structures And Algorithms

# Exercise 3:

#E-commerce Plateform Search Function

import java.util.\*;

public class AD {

public static void main(String[] args) {

List<String> products = Arrays.asList("Laptop", "Phone", "Charger", "Tablet", "Headphones");

Scanner scanner = new Scanner(System.in);

System.out.print("Enter search keyword: ");

String keyword = scanner.nextLine().toLowerCase();

boolean found = false;

for (String product : products) {

if (product.toLowerCase().contains(keyword)) {

System.out.println("Found: " + product);

found = true;

}

}

if (!found) {

System.out.println("No products match your search.");

}

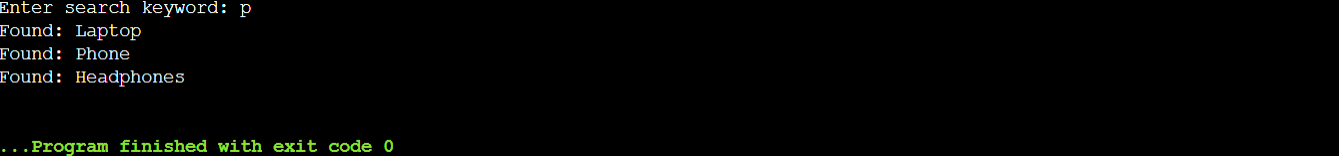
}

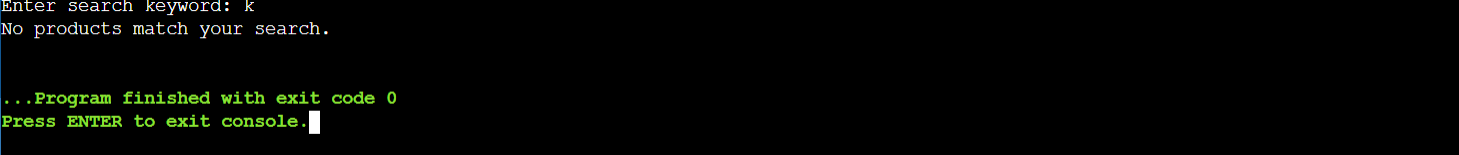
}

# Output:

A screenshot of a computer

AI-generated content may be incorrect.





# Exercise 4:

#Financial Forecasting

# Code:

public class AD2 {

public static void main(String[] args) {

double[] sales = {10000, 12000, 9000, 15000, 18000};

double total = 0;

for (double s : sales) {

total += s;

}

double average = total / sales.length;

double forecast = average \* 1.10;

System.out.printf("Average sales: %.2f\n", average);

System.out.printf("Forecasted next month sales: %.2f\n", forecast);

}

}

# Output:

A screenshot of a computer

AI-generated content may be incorrect.