**III. Programming Problems**

1. Problem Description

We want to develop a program which manages the purchasing of products. There are 10 different types of products in a stock. Each product has a unique identification number from 1 to 10. We want to maintain the price of each product type, the identification number of each product type and the number of items of each kind of product that are purchased. A customer can buy several products at once. For example, you can show purchasing information such as:

* 1 item from product type 5,
* 4 items from product 2,
* 7 items from product type 1.

Given the above information of a product, the program should perform the following functions.

**1**. View the unit price of a product

2. Add an item to the information system when a product is purchased

3. Calculate the total price of a product

1. **Detailed Description of each function:**
2. **View the unit price of a product:** Scan the product identification number and show the price of the product( 5pt)
3. **Add a purchasing product to the system(5pt)**:

* Scan the product identification number and save the price of the item of the purchased product.
* If this product is already in a purchasing list, add the quantity (number) of the product.
* Subtract the number (quantity) of the purchased product in stock.
* If the quantity of a selected product in the stock is not sufficient (the total stock of the product is less than the **number of products** to be purchased), display the error message “**the product is out of stock**” on the screen.

1. **Calculate the total price (5pt)**: Display the total price of the purchased items and exit the program.
2. **User Interface Requirements:**

* Once the program starts, the program should display to the user the **menu** to select one of the above three function.
* “View the unit price” and “Add a purchasing product” function can be performed **repeatedly**.
* Finally selecting **“Calculate the total price**” function and terminate the program

1. **Hint:**

* Write a java program using **only one** **class** (eg. Purchasing). This is similar to C programming paradigm which has **only one file**.
* All methods of the class, including **main ()** method must be **static methods** .
* All fields of the class are shared by all methods (functions) of the class and they are **static member** variables.
* Hence, a **java program** with one class which has **only static** functions and **static** variable is same as the C program.

e.g.

static **int[]** unit\_price; // static variable

static void **view\_unit\_price**(...) { ... } // static method

* Initial value of product price information or stock information can be used and configured in program.
* How to use **basic array** refer to your slide

e.g.

a) **static** int[] unit\_price = {10, 20, 30, 40, 50, 60, 70, 80, 90, 100};

// when initialize integer array, assign the size.

b) **static i**nt[] unit\_price = new int[10]; **// create array to save 10 of integer dynamically**

Question: Write the entire program and attach the screen shot of the running program