# WORKSHEET #11

## Assumes: Ch1, Ch2, Ch3, Ch5, Ch6, Ch7, Ch8, Ch9-ArrayList

1. Using Object Oriented methodology, write a service class that has a two-dimensional n-by-n array of ints as its instance variable called **theNumbers**, the array is filled by the secondary constructor with random 0s and 1s. The number n is given by the user when prompted from the client. The service class has the following business methods
   1. A method that finds the rows and columns in **theNumbers** array with the most 1s. Hint: the method should use two **ArrayList** lists to store the row and column indices with the most 1s. For example for an array of size 4-by-4 that was randomly filled with the following numbers:

|  |  |  |  |
| --- | --- | --- | --- |
| 0 | 0 | 1 | 1 |
| 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 0 | 1 | 0 |

There is one row with the largest number of 1s: row at index 2; and there are two columns with the largest number of 1s: column at index 2 and 3.

* 1. A method that returns ArrayList containing all elements of **theNumbers** array arranged by rows. Client should call the method and print the content of the returned array.
  2. A method that returns ArrayList containing all elements of **theNumbers** array arranged by columns. Client should call the method and print the content of the returned array.

1. Using Object Oriented methodology, write a service class that has an ArrayList of integers as its instance variable called **theNumbers**, the client prompts the user to enter some amount of positive integers, where 0 will indicate to the program the stop of the input. The numbers as given by the user should be added to an ArrayList, this list should be passed as an input to the constructor, and the constructor should use the content of the passed list to fill its field **theNumbers**. The service class has the following business methods:
   1. A method that sorts the elements of **theNumbers** in ascending order (utilizes bubble sort algorithm for sorting)
   2. A method that returns an ArrayList which contains the elements from **theNumbers** with duplicates removed
   3. A method that shuffles the elements in t**heNumbers**
2. Write a ComputerPart class, a ComputerKit class, and a client class to test them. The ComputerPart class has two instance variables: a String representing an item (for instance, “cpu” or “disk drive”), and a double representing the price of that item. The ComputerKit class has just one instance variable: an ArrayList of ComputerPart objects (they make up a computer) representing the list of parts for the computer kit.

You should include the following methods:

1. A method returning “expensive” if the total of the pieces of the ComputerPart objects is greater than $1000, “cheap” if it is less than $250, “normal” if it is between $250 and $1000
2. A method returning true if a certain item is included in the list of parts; false otherwise
3. A method returning how many times a particular item (for instance “cpu”, or “memory”) is found in the list of parts
4. ☺