# SE116 – LAB#2 2023-2024 SPRING

**Topic:** Introduction to Object Oriented Programming, OO Design Principles (Abstraction, Encapsulation, Modularity), Classes

**1.** You have a vending machine that gives snacks and beverages to people. The machine gives to users a selection of items such as coffee, water, tea, soda, cracker, sandwich, cookie and chocolate. You will define a `main` method in a sample `class`. In `main`, use `switch-case` (or `if-else`) statements to select the snacks or beverages. When a selection is done by the user, program must print out the selected item to the user. You can implement two different classes, `Snack` and `Beverage`, for holding information for the items, with using separate classes having `private` variables such as `name` and `price`.

You can use an **infinite loop** in your program for continuous item flow and terminate it upon the user's related choice. In the end, the program must display all of the items given to the users, the most and the least given items, total number of beverages and total number of snacks that are given to the user and the total price of all the snacks and beverages taken.

**2.** Implement a class `Animal` that contains the following two instance variables: '`name`' of type `String` and '`sound`' of type `String`. In other words, `Animal` HAS-A `name` and `Animal` HAS-A `sound`. The data member `name` represents the category of an animal (such as, "dog", "cat", "bird", "pig", "sheep") and the data member `sound` represents the sound belonging to the corresponding category (such as, "hav", "meov", "cik", "oink", "mee"). Define a parameterized constructor and the setter/getter methods in class scope.

To test your class `Animal`, implement a class `Test` that includes the following two methods: '`choir`' and '`main`'.

The method `choir` takes an array of `Animal` references as its only parameter. This method will simulate a choir of animals via sequentially printing the sounds of animals randomly chosen. In the method body, sequentially for 20 times, you will generate a random integer value to fall in the interval (`[0, arrayLength-1]`) and will use this random value as the index of the array to print the sound of the animal object referred by the corresponding content of the array.

Within the method `main`, define an array of 5 `Animal` references. Remember that the array contents are initially null. Instantiate 5 new `Animal` objects (using the data values either to be read from the user or hardcoded in the program) and assign the reference of each object to each content of the array. Finally, call the method `choir` by passing the array reference as its argument.