**WIA1002/WIB1002/WXES1117 Data Structures**

**Tutorial : ADTs**

**Question 1**

1. A new candy machine is bought for the cafeteria and a program is needed to make the machine function properly. The machine sells candies, chips, gum, and cookies. A Java application program is needed for the candy machine so that it can be put into operation.
2. The program should do the following :
   1. Show the customer the different products sold by the candy machine.
   2. Let the customer make the selection.
   3. Show the customer the cost of the item selected.
   4. Accept the money from the customer.
   5. Release the item.

Input: The item selection and the cost of the item

Output: The selected item

Your task is to design the components of the candy machine. Identify the necessary requirements (data and operations) and produce a UML diagram for this and specify the pseudocodes for the process of buying a candy.

**Question 2**

Write the definition of a class, swimmingPool, to implement the properties of a swimming pool. Your class should have the instance variables to store the length (in feet), width (in feet), depth (in feet), the rate (in gallons per minute) at which the water is filling the pool, and the rate (in gallons per minute) at which the water is draining from the pool. Add appropriate constructors to initialize the instance variables. Also add member functions, to do the following: Determine the amount of water needed to fill an empty or partially filled pool; the time needed to completely or partially fill the pool, or empty the pool; add water or drain for a specific amount of time.