Question 1

Design a simple Date class. Every Date should have a Day, Month and Year. The constructor for the class should take input parameters for all three instance variables. The class should include accessor methods for each instance variable. Ensure that the following code works in your DateTester class:

```
Date paddysDay = new Date(17, 3, 2021);
System.out.println("The day is: " + paddysDay.getDay());
System.out.println("The month is: " + paddysDay.getMonth());
System.out.println("The year is: " + paddysDay.getYear());
```

Question 2

1. Implement a class to represent a *Bottle*. A *bottle* has the following properties: All bottles have a maximum capacity, measured in litres and all bottles contain a quantity of water at any given time, also measured in litres.

   We can perform the following operations on the bottle
   - Fill a bottle completely from the tap
   - Empty a bottle
   - Pour a specified amount of water from the bottle (The amount of water poured out is limited by the capacity of the bottle and by the amount of water in the bottle)
   - Get the amount of liquid currently in the bottle
   - Get the amount of liquid needed to fill the bottle completely
   - An overloaded method to fill the bottle by a certain amount

   Design a class called *Bottle* that implements the properties described above. To begin with, let all bottles be empty. Set the maximum capacity of the bottle. The default max capacity should be .75 litre, unless specified on construction. Once a Bottle has been instantiated, it should not be possible to change its capacity.

2. Draw your UML diagram

3. Implement the `Bottle` class fully.

4. Write a simple `BottleTester` program that tests the Bottle class fully.

5. Using the class `Bottle` write a program that will allow the user to select the following options from a menu until the user chooses to stop.

   Bottle Menu
   1. Fill bottle completely
   2. Fill bottle by a certain amount
   3. Check amount of water in bottle
   4. Check amount of water needed to fill bottle
   5. Empty bottle
   6. Pour an amount from bottle
   7. Quit

   Please select your option: