Programming II – Test 1 (Prescription)

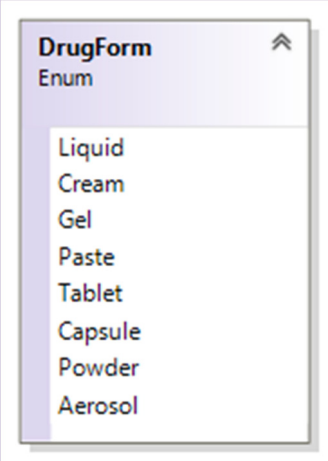
You have 90 minutes to complete all the tasks.

Your company was asked to build a contact manager for a pharmaceutical store, the software architects of your company have designed the system and your supervisor has assigned the task of coding two classes. The two classes are a Drug class and a Prescription class both of them are fully described below.

A test harness is provided to test your classes. You are required to match the provided output EXACTLY!

The DrugForm Enum — 5 marks

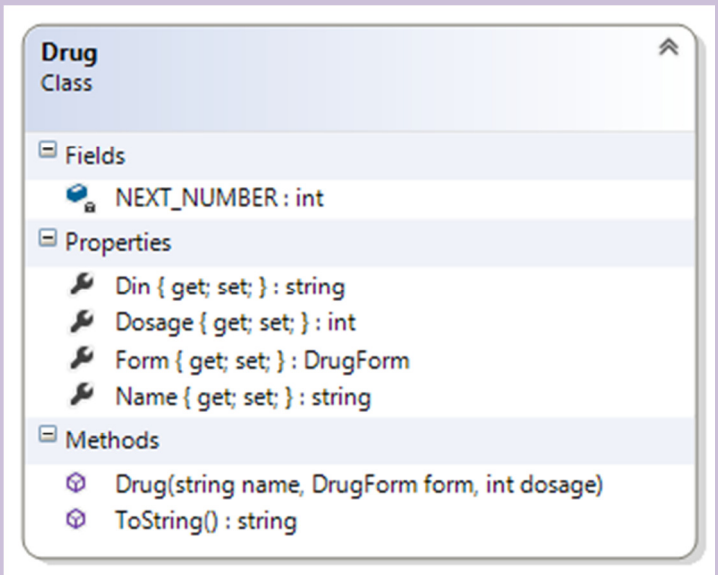
This enum describes the drug form. The explanation are as follows:



This enum must be defined in a scope so that the other class will be able to access with miminal problems.

The Drug Class 23 marks

This class is used to capture information on a pharmaceutical Drug.



Fields:

3 Marks **NEXT_NUMBER** – this private static int represents the value to be used when creating a Drug object. It is initialized to 101. This variable is used and updated in the constructor `public Drug(string name, …)`.

2 Marks **Din** – this string is the drug identity number. This member is set in the constructor. The class variable **NEXT_NUMBER** is used to generate a unique string. This is a public **readonly** field.

Properties:

2 Marks **Dosage** – this int represents the dosage of this object. This is an auto-implemented property, the getter is public and the setter is private.

2 Marks **Form** – this represents the DrugForm of this Drug object. This is an auto-implemented property, the getter is public and the setter is private.

2 Marks **Name** – this double represents the amount that is owed by this Customer. This is an auto-implemented property, the getter is public and the setter is private.

Constructor:

7 Marks `public Drug(string name, int dosage, DrugForm form = DrugForm Tablet)` – This is constructor does the following:

- Assigns the arguments to the appropriate properties.

- It also assigns the **NEXT_NUMBER** field to the **DIN** property (you will have to do some kind of conversion) and increments it.
- The last argument has a default value.

Methods

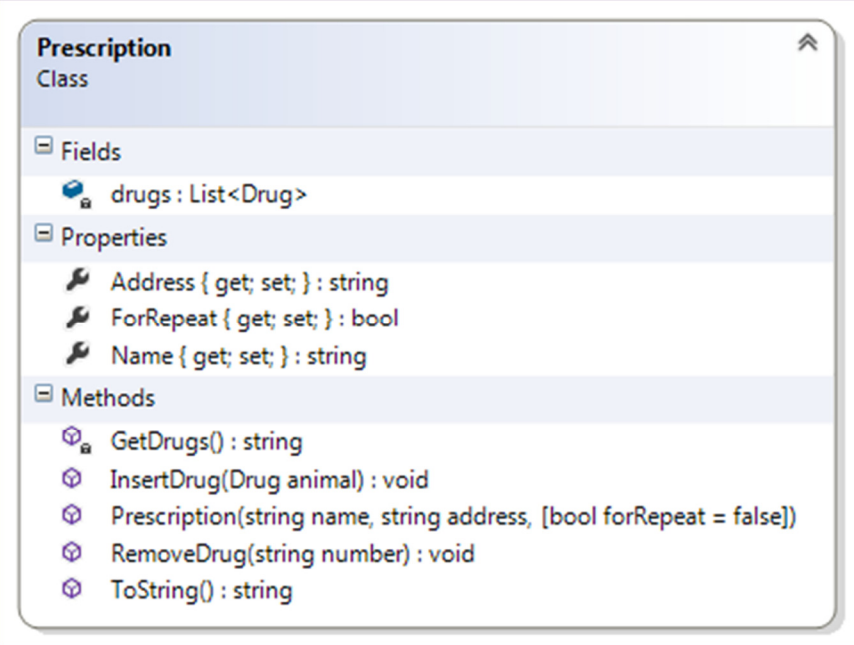
5 Marks

`public override string ToString()` – This method overrides the corresponding method of the object class to return a suitably formatted string. See the sample output for ideas on how to format your output.

This method does not display anything.

The Prescription Class 40 Marks

We are going to model a Prescription type. There are 8 members in this class as shown in the class diagram below.



Description of class members

Fields:

3 Marks

drugs – this is a list of Drugs. It represents a collection of Drugs that comprise this Prescription. This is initialized at declaration. This field is private.

Properties:

2 Marks

Name – this string represents the name of the person for this prescription. This is an auto-implemented property, the getter is public and the setter is private.

2 Marks **ForRepeat** – this bool indicates if this prescription is to be repeated. This is an auto-implemented property, the getter is public and the setter is private.

2 Marks **Address** – this string represents the address of the patient. This is an auto-implemented property, the getter is public and the setter is private.

Constructor:

3 Marks `public Prescription(string name, string address, bool forRepeat = false)` – This is constructor assigns the arguments to the appropriate properties. Note the last argument has a default value.

Methods

3 Marks `public void InsertDrug(Drug drug)` – This public method add the argument to the field **drugs**.

This method does not display anything.

10 Marks `public void RemoveDrug(string din)` – This public method removes a Drug from the collection of Drugs. This method uses an appropriate loop to check each Drug in the collection. If the **Din** property of that Drug matches the argument then that particular Drug is removed from the collection. If the Drug could not be found then an `Exception` object with a suitable message is thrown. [Use the method **RemoveAt(i)** of the list class to delete the Drug from the collection].

> You should not use a **foreach** loop in this method, because it iterates in a readonly fashion so you will not be able to remove it.
>
> Use either a **for** or a **while** or a **do-while** loop

This method does not display anything.

8 Marks `private string GetDrugs()` – This is a private method that returns a string representing all the elements of the drugs collection. There is a single line for each element. This method is used in the **ToString()** method below to print a Store. [To get a new line use the `"\n"` sequence].

This is method does not display anything.

6 Marks `public override string ToString()` – This is a public method overrides the corresponding method in the object class to return a stringified form of the object. In addition to the **Name**, **Address** and **ForRepeat** properties, this method uses the `GetDrugs()` method to generate a string for all the Drugs. Examine the output to decide on your formatting code.

This method does not display anything.

Test Harness

Insert the following code statements in your Program.cs file:

```
//test the Drug class
Console.WriteLine("\n*****Testing the Drug Class");
Console.WriteLine(new Drug("Aspirin", 85));
Console.WriteLine(new Drug("Tylenol", 125, DrugForm.Capsule));
Console.WriteLine(new Drug("Metformin", 250));

//test the Prescription class
Console.WriteLine("\n*****Testing the Prescription Class");
Console.WriteLine(new Prescription("Joanne Fillotti", "Markham Road"));

//testing InsertDrug method of the Prescription class
Console.WriteLine("\n*****Testing the InsertDrug()");
Prescription store0 = new Prescription("Jake Nesovich", "Morningside Avenue",
false);
store0.InsertDrug(new Drug("Oxycontin", 150, DrugForm.Gel));
store0.InsertDrug(new Drug("Marjuana", 200, DrugForm.Paste));
store0.InsertDrug(new Drug("Amoxicillin", 350, DrugForm.Capsule));
store0.InsertDrug(new Drug("Fentanyl", 50, DrugForm.Aerosol));
Console.WriteLine(store0);

Console.WriteLine("\n*****Testing the InsertDrug()");
Prescription store1 = new Prescription("Bindu Ggoel", "Williams Parkway", true);
store1.InsertDrug(new Drug("Warfarin", 125, DrugForm.Gel));
store1.InsertDrug(new Drug("Prozac", 300, DrugForm.Paste));
store1.InsertDrug(new Drug("Ibuprofen", 250));
store1.InsertDrug(new Drug("Oxycodone", 85, DrugForm.Liquid));
store1.InsertDrug(new Drug("Ropinirole", 125, DrugForm.Cream));
store1.InsertDrug(new Drug("Tramadol", 250, DrugForm.Powder));
Console.WriteLine(store1);

//testing the RemoveCustomer method of the invient class
//check the previous display to verify that atleast
//two of the item numbers are used below
Console.WriteLine("\n*****Testing the RemoveDrug()");
store1.RemoveDrug("109");
store1.RemoveDrug("110");
try
{
    store1.RemoveDrug("109");
}
catch (Exception e)
{
    Console.WriteLine(e.Message);
}
Console.WriteLine(store1);
```

Sample Output

The following the output of a completed solution. Examine the output carefully to decide on the return value of the **`ToString()`** of the Drug class and the **`ToString()`** method of the Prescription class.

```
*****Testing the Drug Class
101 Aspirin 85g (Tablet)
102 Tylenol 125g (Capsule)
103 Metformin 250g (Tablet)

*****Testing the Prescription Class
Joanne Fillotti, Markham Road
List of drugs:

*****Testing the InsertDrug()
Jake Nesovich, Morningside Avenue
List of drugs:
 104 Oxycontin 150g (Gel)
 105 Marjuana 200g (Paste)
 106 Amoxicillin 350g (Capsule)
 107 Fentanyl 50g (Aerosol)

*****Testing the InsertDrug()
Bindu Ggoel, Williams Parkway(R)
List of drugs:
 108 Warfarin 125g (Gel)
 109 Prozac 300g (Paste)
 110 Ibuprofen 250g (Tablet)
 111 Oxycodone 85g (Liquid)
 112 Ropinirole 125g (Cream)
 113 Tramadol 250g (Powder)

*****Testing the RemoveDrug()
Error: drug 109 not found
Bindu Ggoel, Williams Parkway(R)
List of drugs:
 108 Warfarin 125g (Gel)
 111 Oxycodone 85g (Liquid)
 112 Ropinirole 125g (Cream)
 113 Tramadol 250g (Powder)
```