Practical Task 2.2

(Pass Task)

General Instructions

This simple practical task is the start of a series of exercises in which you will develop a small banking system applying all important OOP concepts. Your first task is to complete the `Account` class, one of the core classes of the future program. You will need to focus on the use of classes and objects and the ability to capture knowledge and behaviour within objects.

The banking system you are developing must have an account, which allows to withdraw and deposit money. In addition, it must be capable to print its balance and other details to the terminal. There are two auxiliary instance variables to support this functionality and capture the state of an object of the `Account` class:

- **`_balance`** of decimal data type,
- **`_name`** of String data type.

The following methods of the class must be made accessible to a user:

- **Account(String name, decimal balance)**

  Constructor. Initializes a new instance of the Account class and sets its initial `_balance` and `_name` attributes to the respective values given in the input.

- **void Deposit(decimal amount)**

  Adds funds to the account increasing the `_balance` by the specified amount.

- **void Withdraw(decimal amount)**

  Withdraws funds from the account decreasing the `_balance` by the specified amount.

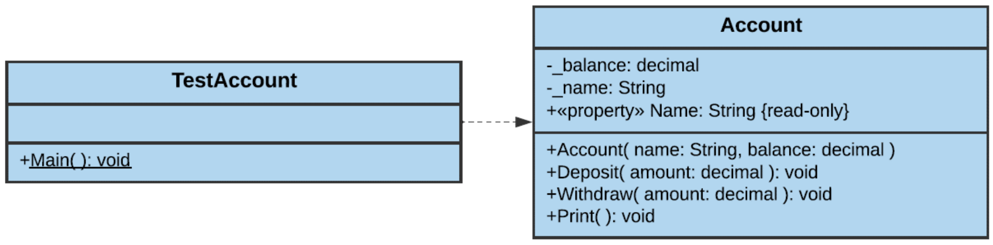
- **void Print( )**

  Prints the contents of `_balance` and `_name` of the account to the terminal.

- **String Name**

  Property. Gets the `_name` of the account.

The following UML diagram should help you to understand the design of the `Account` class.


TestAccount
+Main( ): void
Account
-_balance: decimal
-_name: String
+«property» Name: String {read-only}
+Account(name: String, balance: decimal)
+Deposit(amount: decimal): void
+Withdraw(amount: decimal): void
+Print( ): void

Create a new C# Console Application project and write your code for the `Account` class. Rename the default `Program` class to `TestAccount` and write a test driver to examine the public methods of the `Account` class. Test your program and make sure that an object of the `Account` class behaves as expected.

Prepare to discuss the following with your tutor:

- How ***classes*** are used to define ***objects***.
- How ***methods***, ***fields*** (***attributes***), and ***properties*** all work together when you create a class.
- How fields give knowledge to each object created from a class.
- How methods give capabilities to each object created from a class.

Further Notes

- Study the way to program and use classes and objects in C# by reading Sections 2.3-2.6 of SIT232 Workbook available in CloudDeakin → Resources.
- The following links will give you more insights on classes/objects and relevant topics:
  - https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/classes-and-structs/classes
  - https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/concepts/object-oriented-programming
  - https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/classes-and-structs/members
  - https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/classes-and-structs/methods
  - https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/classes-and-structs/constructors
  - https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/classes-and-structs/objects

  Because this information is quite detailed and addresses some advanced concepts in OOP, you may mainly focus on the parts you feel relevant to this practical task.
- If you seriously struggle with the remaining concepts used in this practical task, we recommend you to start reading the entire Sections 1 and 2 of SIT232 Workbook.
- In this unit, we will use Microsoft Visual Studio 2017 to develop C# programs. Find the instructions to install the community version of Microsoft Visual Studio 2017 available on the SIT232 unit web-page in CloudDeakin in Resources → Software → Visual Studio Community 2017. You however are free to use another IDE, e.g. Visual Studio Code, if you prefer that.

Marking Process and Discussion

To get your task completed, you must finish the following steps strictly on time.

- Make sure that your program implements the required functionality. It must compile and have no runtime errors. Programs causing compilation or runtime errors will not be accepted as a solution. You need to test your program thoroughly before submission. Think about potential errors where your program might fail.
- Submit the expected code files as an answer to the task via OnTrack submission system. Cloud students must record a short video explaining their work and solution to the task. Upload the video to one of accessible resources, and refer to it for the purpose of marking. You must provide a working link to the video to your marking tutor in OnTrack.
- On-campus students must meet with their marking tutor to demonstrate and discuss their solution in one of the dedicated practical sessions. Be on time with respect to the specified discussion deadline.
- Answer all additional questions that your tutor may ask you. Questions are likely to cover lecture notes, so attending (or watching) lectures should help you with this **compulsory** interview part. Please, come prepared so that the class time is used efficiently and fairly for all students in it. You should start your interview as soon as possible as if your answers are wrong, you may have to pass another interview, still before the deadline. Use available attempts properly.

Note that we will not accept your solution after the submission deadline and will not discuss it after the discussion deadline. If you fail one of the deadlines, you fail the task and this reduces the chance to pass the unit. Unless extended for all students, the deadlines are strict to guarantee smooth and on-time work throughout the unit.

Remember that this is your responsibility to keep track of your progress in the unit that includes checking which tasks have been marked as completed in the OnTrack system by your marking tutor, and which are still to be finalised. When marking you at the end of the unit, we will solely rely on the records of the OnTrack system and feedback provided by your tutor about your overall progress and quality of your solutions.