Lab 3

# Objectives

Practice C# code writing that involves object oriented programming concepts such as inheritance, polymorphism, and interfaces.

# Instructions

* Install Visual Studio 2017 or Visual Studio 2019 to your computer.<https://visualstudio.microsoft.com/>
* For each question below submit your C # and also screenshots showing how your program compiles and executes (sample outputs)- You can upload your C# project but alternatively create a document with your C# code **text** copied and pasted and your screenshots pasted and then upload the document to Blackboard for submission. Prof. Aydin should be able to run your submitted code.
* Your name should appear on the screenshots for receiving full credit.
* **Academic Integrity:** If you are stuck when working in this lab you can collaborate with a couple of classmates. In that case, make sure to write/submit the name of your collaborators and any web site you used as a resource to understand the concepts and lab questions and to complete your code to prevent plagiarism and breach of academic integrity.
  + You are *not* allowed to directly copy code from the Internet, your friends, and other resources without spending any effort in completing the work. Make sure to review the academic integrity policy in the syllabus and ask for clarification, if needed.

1. **Implementing an Extension Method**

Your job is to write an extension method called toRoman to convert and int to its roman representation so that a client code such as below would work.

static void Main(string[] args)

{

int i = 99;

string s = i.toRoman();

Console.WriteLine(s);

}

* Hint: Review [Week 3 - Chp 3 slides](https://drive.google.com/drive/folders/1-voMzBRitOdXiBNl8SrMm_WM-CbnhxQD?usp=sharing) and [Extension Methods - C# Programming Guide](https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/classes-and-structs/extension-methods) from Microsoft to understand how to implement an extension method is. There are example code there too
* Hint: You can refer to [this link for the algorithm](https://www.rapidtables.com/convert/number/how-number-to-roman-numerals.html) to convert a decimal to a roman number.
* Hint: If you have issues compiling your code, make sure to include the extended method in its own static class with its own namespace.

1. **Abstract classes and Interfaces** (Review [Week 4 - Chp 4 slides](https://drive.google.com/drive/folders/1-voMzBRitOdXiBNl8SrMm_WM-CbnhxQD?usp=sharing))

* Create an **abstract class Product**  with following
  + Properties Price (Decimal), Code (string), Description (string)
* Create an **interface ISellable** with the following
  + Method sell that takes the count of the products to sell and returns the cost

public decimal sell(int count);

* Create a **concrete class Book** that
  + Inherits from class Product
  + and implements interface ISellable
  + Has additional Property Author (string)
  + Add a constructor with parameters, and ToString method to display all of data of class Book
* Similarly, create anot **concrete class Software** that
  + Inherits from class Product
  + and implements interface ISellable
  + Has additional Property Version (string)
  + Add a constructor with parameters, and ToString method to display all of data of the class Software
* Finally, write a client code (main program) that will utilize the class and interface hierarchy you created.
  + Create two Book objects for the following books
    - *C# 8.0 in a Nutshell, with price $50.99 and with ISBN 978-1492051138 by Jack Smith*
    - *C#: Advanced Features and Programming Techniques, with price $2.99 and with ISBN 100-1492051000 by Jill Smith*
    - Ask the user how many of each book the user wants to buy and then display a report of how much the total cost is.
  + Create a Software object for the following Software
    - *Microsoft 365 Personal with price $69.99 and version 16.0.10827*
    - Ask the user how many of the Microsoft 365 the user wants to buy and then display a report of how much the total cost is.