Lab 8

# Objectives

Practice C# code writing that involves collections

# 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.

We have the following student data. Your job is to utilize the collection classes in .NET and process the student data as asked below. Hint: Review [Week 10 &11 (Chapter 10) slides](https://drive.google.com/drive/folders/1-voMzBRitOdXiBNl8SrMm_WM-CbnhxQD?usp=sharing) about Collections.

|  |  |  |  |
| --- | --- | --- | --- |
| ID (a number between 1000-9999) | Name | Status | State |
| 2000 | Mike Smith | Freshman | NY |
| 4444 | Alice Smith | Sophomore | NC |
| 2002 | Tom Brown | Freshmen | NY |
| 3000 | Sarah Smith | Senior | NY |
| 1001 | Samantha Green | Junior | MD |
| 4004 |  | Junior | NJ |
| 1000 |  | Frehmen | NJ |

1. Write a C# program with collection class [List<T>](https://docs.microsoft.com/en-us/dotnet/api/system.collections.generic.list-1?view=netcore-3.1) and use the collection to store all student data. Then utilize [ToLookup extension method](https://docs.microsoft.com/en-us/dotnet/api/system.linq.enumerable.tolookup?view=net-5.0) to list all the students
   1. students with freshman status
   2. Students from NY state
2. Write another C# program but this time use the collection class [SortedList<TKey,TValue>](https://docs.microsoft.com/en-us/dotnet/api/system.collections.generic.sortedlist-2?view=netcore-3.1) to store the student data where TKey will be the id of a student and TValue will be the student object for each student data.
   1. Then list all of the student data sorted by id
   2. Ask the user for entering an id to search and then look up the id in the collection. If id is found, then display all of the data for the student, if not display an appropriate “not found” message
3. Write one other C# program but this time use the collection class [Dictionary<TKey,TValue> Class](https://docs.microsoft.com/en-us/dotnet/api/system.collections.generic.dictionary-2?view=netcore-3.1) where TKey will be the id of a student and TValue will be the student object for each student data.
   1. Then list all of the student data sorted by id
   2. Ask the user for entering an id to search and then look up the id in the collection. If id is found, then display all of the data for the student, if not display an appropriate “not found” message