Assignment#1 – Generics & Linear Data Structure

Due Date: Midnight of May 24, 2024 (Friday)

Purpose: The purpose of this assignment is to help you:

- Become familiar with Linear data structure
- Have solid understanding of collections

Instructions: Be sure to read the following general instructions carefully:

This assignment should be completed individually by all the students. You are encouraged to demonstrate your solution during lab session, and submit your solution **through the dropbox**. You must name your submission according to the following rule: **studentID(yourlastname)_ASSnumber.zip**. e.g., 300123456(**smith)_ASS#1**.zip

Rubric

	Functionality	**Marks**
Q1	1.1 Stack vs Queue	4
	1.2 type constraints	2
Q2	2.1 Implementation of the extension method	1.5
	2.2 Consume the extension method	0.5
Q3	3.1 Finish class SinglyLinkedList<E>	10+4
	3.2 Load data from Auto_mpg.csv, and insert them into a Singly Linked list, you can either add vehicle info at the first or at the end 3.2.1 Modelling the data in Auto_mpg.csv 3.2.2 load data from csv file 3.2.3 insert vehicles' info to a ***SinglyLinkedList*** 3.2.4 print out all vehicles on the screen in a good format	 2 2 1 1

Question 1 [6 marks]

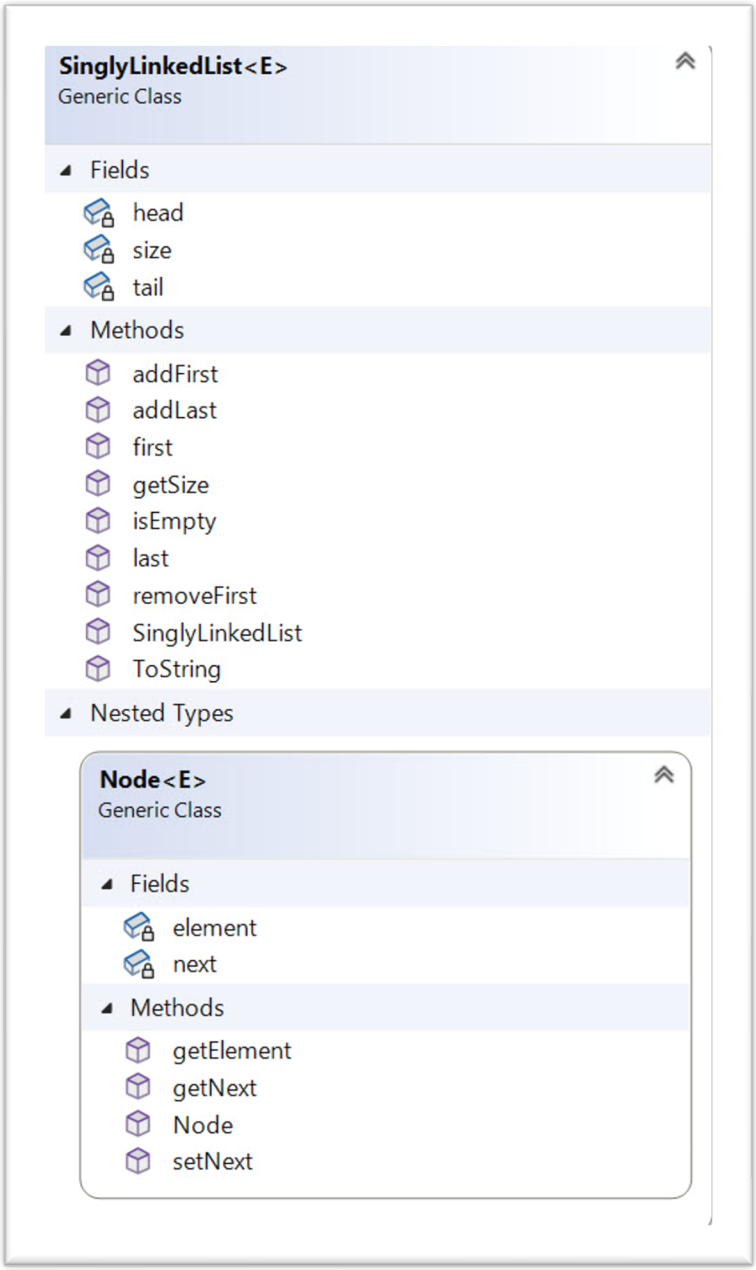
1.1 Use examples to illustrate the features of stack and queue [4 marks]
1.2 Use example to demonstrate what a type constraint is [2 marks]

Question 2 [2 marks]

Implement an extension method for ***ObservableCollection<T> class to*** add all elements in a List<T> to the end of the ObservalableCollection<T> object. Test the implemented extension method.

Question 3[20 marks]

Implement generic class ***SinglyLinkedList<E>***, including its nested class ***Node<E>***



Implement a C# application to consume the implemented ***SinglyLinkedList<E>***. More specifically, load the data from ***Auto_mpg.csv*** and store those data into a singly linked list.
1. Insert data line by line, the insertion can be occurred at the head of your singly linked list, ***or*** at the end of your singly linked list
2. print out all elements in the singly linked list in a good format (e.g., one line per vehicle).