Assignment 1

■ Understanding Data Types:

1. What type would you choose for the following “numbers”?
   A person’s telephone number: String
   A person’s height: Int
   A person’s age: Int
   A person’s gender (Male, Female, Prefer Not To Answer): Enum
   A person’s salary: Double
   A book’s ISBN: String
   A book’s price: Float
   A book’s shipping weight: Float
   A country’s population: Long
   The number of stars in the universe: Long
   The number of employees in each of the small or medium businesses in the United Kingdom (up to about 50,000 employees per business): ushort

2. What are the difference between value type and reference type variables? What is boxing and unboxing?
   Ans: 1.Value type will directly hold the value while reference type would store the memory address for the value; 2.Value type is stored in stack memory while reference type is stored in heap memory; 3. Value type will not be collected by GC while reference type will; 4. Value type will be created using Enum and Struct while reference will be created by class, delegate, interface and array; 5. Value type cannot accept null value but reference type can.
   Boxing is the process to convert a value type into an object, and unboxing is to extract the value from an object.

3. What is meant by the terms managed resource and unmanaged resource in .NET
   Ans: Managed resources basically mean anything managed by the CLR. Unmanaged resources typically mean native resources that are created and lifetime managed outside the CLR and not under the control of garbage collector.

4. What’s the purpose of Garbage Collector in .NET?
   Ans: GC manages the allocation and release of memory for your application on the managed heap.

■ Controlling Flow and Converting types

1. What happens when you divide an int variable by 0?
   Would raise an Error CS0020: Division by constant zero.

2. What happens when you divide a double variable by 0?
   Dividing a floating-point value by zero doesn't throw an exception; it results in positive infinity, negative infinity, or NAN.

3. What happens when you overflow an int variable, that is, set it to a value beyond its range?
   We would get a negative value.

4. What is the difference between x = y++; and x = ++y;?
   X = y++ -> first x = y, then y++
   X = ++y -> first y++, then x = y

5. What is the difference between break, continue, and return when used inside a loop statement?
   Break is to directly jump out of a loop, continue is to jump out of this iteration and continue to do next one, and return is to return a value and terminate the function.

6. What are the three parts of a for statement and which of them are required?
   Initialize, test and update.
   All three parts are optional.

7. What is the difference between the = and == operators?
   = is to assign value and == is to compare 2 values.

8. Does the following statement compile? for (; true;) ;
   Yes

9. What does the underscore _ represent in a switch expression?
   _ represent a default situation.

10. What interface must an object implement to be enumerated over by using the foreach statement?
   IEnumerable