Introduction to C# and Data Types

Understanding Data Types

Test your Knowledge

1. What type would you choose for the following “numbers”?

A person’s telephone number - string

A person’s heightA person’s age - int

A person’s gender (Male, Female, Prefer Not To Answer) – int or string

A person’s salary – int, double, decimal

A book’s ISBNA book’s price – isbna string, price int/double/decimal

A book’s shipping weight int/double/decimal

A country’s population int/double/decimal

The number of stars in the universe int/double/decimal

The number of employees in each of the small or medium businesses in the United Kingdom (up to about 50,000 employees per business) - int

2. What are the difference between value type and reference type variables? What is boxing and unboxing?

Value type assign value directly to a variable, at same location. Reference type will store value in a reference where the actual value is, variable in local but actual value in heap.

All data type can be in value type except for object and string.

Class, string, object, array, etc are reference type

Boxing converts **value type to reference type (int num = 23, object obj = num)**

Unboxing converts **reference type to value type (int num = 23, object obj = num, int i = (int)obj)**

3. What is meant by the terms managed resource and unmanaged resource in .NET

Managed resources is also “managed memory,” and is managed by garbage collector. Unmanaged source is are those garbage collector does not know how to handle, such as file, network connection, database connection.

4. Whats the purpose of Garbage Collector in .NET?

Automatic memory manager, allocate and release of memory for application.

As long as address space available, garbage collection and allocate new object.

Release object memory based on root.

Controlling Flow and Converting Types

Test your Knowledge

1. What happens when you divide an int variable by 0?

System will throw exception message “System.DivideByZeroException.”

1. What happens when you divide a double variable by 0?

Double type defines a value infinitely while int does not. therefore double will give infinitely sign.

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

If the function does not have a statement to stop when reach the end of range, it will run infinitely.

4. What is the difference between x = y++; and x = ++y;?

++y or y++ are the same. Both show increment of the iterator.

--y or y-- : decrement of iterator

5. What is the difference between break, continue, and return when used inside a loop statement?

**Break:** terminates loop/switch statement when condition becomes false

**Continue:** it will continue to next (else if or else) statement when previous one (if) not met

**Return:** it will terminate the whole function and return a result

6. What are the three parts of a for statement and which of them are required?

Initializer (declared only once), condition (always true), iterator

7. What is the difference between the = and == operators?

= will return calculation result or value assign to a variable.

== will return true or false

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

It will work and only returned blank result.

9. What does the underscore( \_) represent in a switch expression? Defaults

The underscore in switch expression is default. When there are no matches in the cases, it will fall into default to avoid “unreachable” error.

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

Ienumerable<T> interface

Arrays and Strings

Test your Knowledge

1.When to use String vs. StringBuilder in C# ?

Stringbuilder is mutable, string is immutable

String use more memories than stringbuilder

2. What is the base class for all arrays in C#?

Array Class

3. How do you sort an array in C#?

Use in-built function .Sort()

4. What property of an array object can be used to get the total number of elements in an array?

The Length function will count total number of elements in an array.

5. Can you store multiple data types in System.Array?

No, array can only store single datatype. arrayList can store multiple datatype.

6. What’s the difference between the System.Array.CopyTo() and System.Array.Clone()?

**System.Array.CopyTo():** copy original array to a destination array. Takes two parameters (new array of same datatype, index where we want to start copy from original array)

**System.Array.Clone():** copy the whole array to a new object. One parameter.

Var new\_arr = (\*\*upcast datatype)arr.clone();

When perform clone, must have upcast datatype.

Upcast is convert from one datatype to another.