01 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 height: float or double

A person’s age: ushort or int

A person’s gender (Male, Female, Prefer Not To Answer): string

A person’s salary: decimal

A book’s ISBN: string

A book’s price: decimal

A book’s shipping weight: float or double

A country’s population: uint

The number of stars in the universe: ulong

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 int

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

**Value type**

* Directly contain their data
* Each has its own copy of data
* Operation on one can not effect another
* Stored in stack memory
* Will not be collected by garbage collector
* Can be created by Struct or Enum
* Cannot accept null value

**Reference type**

* Store references to their data
* Two reference variable can reference the same object
* Operation on one can effect another
* Stored in heap memory
* Will be collected by garbage collector
* Can be created by class, interface, delegate, or array
* Can accept null value

**Boxing**: Convert a value type to a reference type

**Unboxing**: Convert a reference type to a value type

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

**Managed resource**: Those are under control and will be collected by garbage collector

**Unmanaged resource**: Those are not under control and will not be collected by garbage collector

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

The garbage collector manages the allocation and release of memory for an application. This means that developers don't have to write code to perform memory management tasks. Automatic memory management can eliminate common problems, such as forgetting to free an object and causing a memory leak or attempting to access memory for an object that's already been freed.

**Controlling Flow and Converting Types**

Test your Knowledge

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

Get DivideByZeroException error

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

Get infinity

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

Get error message: Cannot implicitly convert type ‘long’ to ‘int’.

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

let say y = 1

If you put the ++ operator after the variable, it is incremented after, If x = y++, x=1

If we put the ++ operator before the variable, it is incremented first. If x = ++y, x= 2

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

**break**: used to exit the loop construct immediately.

**continue**: used to skip the current iteration and jump to the next iteration

of the loop.

**return**: If the loop is used inside of a function, return will terminate the both the loop and the function immediately.

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

* The first part initializes the variable(s) we want to use in the loop.
* The second part checks the loop’s condition before each loop cycle.
* And the last part changes the loop variable after each pass through the loop.

None of the three part is required.

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

‘=’ is an assignment operator and is used to assign the value on the right to the variable on the left., ‘==’ is used to check if two operands are equal or not

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

Yes

1. What does the underscore \_ represent in a switch expression?

The underscore (\_) character replaces the default keyword to signify that it should match anything if reached.

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

IEnumerable interface