**What is C#**

* A programming language
* A syntax that allow to give instructions to the computer

C# features:

* Cutting edge language
* Extremely powerful
* Easy to learn
* Easy to read and understand
* Object-oriented

**What is .NET Frmework**

* Environment for execution of .NET programs
* Powerful library of classes
* Programming model
* Common execution engine for many programming languages

**What is CLR – The Heart of .NET Framework**

Common Language Runtime (CLR)

* Managed execution environment
  + Executes .NET applications
  + Controls the execution process
* Automatic memory management (garbage collection)
* Programming languages integration
* Multiple versions support for assemblies
* Integrated type safety and security

**What is Framework Class Library (FCL)**

Provides basic functionality to developers:

* Console applications
* WPF and Silverlight rich-media applications
* Windows Forms GUI applications
* Web applications (dynamic Web sites)
* Web services, communication and workflow
* Server & desktop applications
* Applications for mobile devices

**What is Visual Studio?**

* Compiling, Running and Debugging C# Programs
* Visual Studio is an Integrated Development Environment (IDE)
* Development tool that helps us to:
* Write code
* Design user interface
* Compile code
* Execute / test / debug applications
* Browse the help
* Manage project's files

**What is Compiling Source Code**

The process of compiling includes:

* Syntactic checks
* Type safety checks
* Translation of the source code to lower level language (MSIL)
* Creating of executable files (assemblies)

You can start compilation by

* Using Build->Build Solution/Project
* Pressing [F6] or [Shift+Ctrl+B]

**What is MSDN Library?**

* Complete documentation of all classes and their functionality
  + With descriptions of all methods, properties, events, etc.
  + With code examples
* Related articles
* Library of samples

**Variables** have name, data type and value

**What Is a Data Type?**

* A domain of values of similar characteristics
* Defines the type of information stored in the computer memory (in a variable)

**The default value of integer types is:**

* 0 – for integer types
* except 0L – for the long type

sbyte (signed 8-bit)

* Min: -128
* Max: 127

byte (unsigned 8-bit)

* Min: 0
* Max: 255

short (signed 16-bit)

* Min: -32,768
* Max: 32,767

ushort (unsigned 16-bit)

* Min: 0
* Max: 65,535

int (signed 32-bit)

* Min: -2,147,483,648
* Max: 2,147,483,647

uint (unsigned 32-bit)

* Min:0
* Max: 4,294,967,295

long (signed 64-bit)

* Min: -9,223,372,036,854,775,808
* Max: 9,223,372,036,854,775,807

ulong (unsigned 64-bit)

* Min: 0
* Max: 18,446,744,073,709,551,615

**Floating-point types are:**

float (32-bits)

* Min: ±1.5 × 10-45
* Max: ±3.4 × 1038
* Precision: 7 digits

double (64-bits)

* Min: ±5.0 × 10-324
* Max: ±1.7 × 10308
* Precision: 15-16 digits

The default value of floating-point types:

* Is 0.0F for the float type
* Is 0.0D for the double type

Real numbers are by default interpreted as double!

decimal (128-bits)

* Min: ±1,0 × 10-28
* Max: ±7,9 × 1028 -Precision: 28-29 digits

**The character data type:**

* Represents symbolic information
* Is declared by the char keyword
* Gives each symbol a corresponding integer code
* Has a '\0' default value
* Takes 16 bits of memory (from U+0000 to U+FFFF)

**The object type:**

* Is declared by the object keyword
* Is the base type of all other types
* Can hold values of any type

**What Is a Variable**?

* Placeholder of information that can usually be changed at run-time
* Variables allow you to:
  + Store information
  + Retrieve the stored information
  + Manipulate the stored information

**Literals are:**

* Representations of values in the source code
* There are six types of literals
  + Boolean
  + Integer
  + Real
  + Character
  + String
  + The null literal

The **'0x' and '0X'** prefixes mean a hexadecimal value 0xA8F1

* int numberInHex = -0x10;
* int numberInDec = -16;

**The 'u' and 'U'** suffixes mean a ulong or uint type 12345678U

**The 'l' and 'L'** suffixes mean a long or ulong type 9876543L

**Escaping sequences are:**

Means of presenting a symbol that is usually interpreted otherwise (like ')

Means of presenting system symbols (like the new line symbol)

**Common escaping sequences are:**

* \' for single quote \" for double quote
* \\ for backslash \n for new line
* \uXXXX for denoting any other Unicode symbol
* Benefits of quoted strings (the @ prefix):In quoted strings \" is used instead of ""!

Escape Everithing in the string without double quotes "

We use " to escape "

**What is an Operator?**

* Operator is an operation performed over data at runtime
* Takes one or more arguments (operands)
* Produces a new value
* Operators have precedence
* Precedence defines which will be evaluated first
* Expressions are sequences of operators and operands that are evaluated to a single value

**Operators in C# :**

* Unary – take one operand
* Binary – take two operands
* Ternary (?:) – takes three operands
* Except for the assignment operators, all binary operators are left-associative
* The assignment operators and the conditional operator (?:) are right-associative

Precedence Operators

Highest () . []

++ -- (postfix) new typeof

++ -- (prefix) + - (unary) ! ~

\* / %

+ -

<< >>

< > <= >= is as

== !=

Lower &

Higher ^

|

&&

||

?:

Lowest = \*= /= %= += -= <<= >>= &= ^= |=

**Which of the following statements are TRUE about the .NET CLR?**

* **It provides a language-neutral development & execution environment.**
* **2.It ensures that an application would not be able to access memory that it is not authorized to access.**
* **3.It provides services to run "managed" applications.**
* **4.The resources are garbage collected.**

5.It provides services to run "unmanaged" applications.

* **Indicate the incorrect purpose of the Framework Class Library (FCL)?**
  1. **Provides functionality for creating console applications**
  2. **Provides functionality for creating WPF and Silverlight rich-media applications**
  3. **Provides functionality for creating iOS and Android applications**
  4. **Provides functionality for creating Windows Forms GUI applications**

**Provides functionality for creating web applications (dynamic Web sites)**

* **What will Console.ReadLine() return when there aren't any available lines to read?**

NULL

**!!!! False and True are printed with first capital letter on the console**

**int i = 1;**

**int j = 1;**

**switch (i)**

**{**

**case 1:**

**i = 1;**

**break;**

**case j:**

**i = 2;**

**break; The case value must be a constant**

**case i:**

**i = 3;**

**break;**

**default:**

**i = 4;**

**break;**

**}**

**Console.WriteLine(i); => Compilation error**

**--------------------------------------------------------------------------------------------------**

**int number = 5;**

**if (number++ == ++number)**

**{**

**Console.WriteLine(number + 1);**

**}**

**else**

**{**

**Console.WriteLine(number + 2);**

**}**

**cw(number)=> 9;**

**int count = 0;**

**for (int i = 1, j = 2; i < j; i++, j++)**

**{**

**count++;**

**if (i == 3) i++; break;**

**}**

**Console.WriteLine(count); => 1**

**count =1**

**int sum = 0;**

**while (sum < 10)**

**for (int i = 0; i <= 2; i++)**

**sum += i;**

**Console.WriteLine(sum); =>12**