# Exercises 10 and 11

### 10. Provide a short list with information about the most popular programming languages. How do they differ from C#?

TIOBE Programming Community Index for October 2013 shows that the most used 10 languages for October 2013 are:

1. **C** - Popular language, especially in game programming, because it doesn't have the extra packaging of the object-oriented C++. Programmers use C because it makes programs slightly faster and smaller than programs written in C++.
2. **Java** - multi-platform language that is especially useful in networking. Of course, the most famous usage of Java is on the web, with Java applets, but Java is also used to build cross-platform programs that stand alone. Since it resembles C++ in syntax and structure, learning Java is usually quite easy for most C++ programmers.
3. Objective-C - is a general-purpose, object-oriented programming language that adds Smalltalk-style messaging to the C programming language.
4. **C++** - well-suited for large projects because it has an object-oriented structure. People can collaborate on one program by breaking it up into parts and having a small group or even one individual work on each part.
5. **PHP** - common language for webpage design that is sometimes used as a scripting language in \*nix. PHP is designed for rapid website development, and as a result contains features that make it easy to link to databases, generate HTTP headers, and so forth.
6. **C#** - is a multi-paradigm programming language encompassing strong typing, imperative, declarative, functional, procedural, generic, object-oriented (class-based), and component-oriented programming disciplines.
7. **VisualBasic** - event-driven programming language and integrated development environment (IDE) from Microsoft for its COM programming model first released in 1991.
8. **Python** - widely used general-purpose, high-level programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C.
9. **Transact – SQL -** Microsoft's and Sybase's proprietary extension to SQL. SQL, often expanded to Structured Query Language, is a standardized computer language that was originally developed by IBM for querying, altering and defining relational databases, using declarative statements.
10. **JavaScript -** interpreted computer programming language. As part of web browsers, implementations allow client-side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document content that is displayed. It has also become common in server-side programming, game development and the creation of desktop applications

Differences between some of them and C# are as follow:

#### C C++ and C#

C and C++ - give you a lower level of abstraction that, with increased complexity, provides a breadth of access to underlying machine functionality that is not necessarily exposed with other languages.

C and C++ are cross platform

C# is better than C++ in that:

It has native garbage-collection.

It allows you to treat class-methods' signatures as free functions .It has a huge standard library with so much useful stuff that's well-implemented and easy to use.It allows for both managed and native code blocks. Assembly versioning easily remedy DLL hell problems. You can set classes, methods and fields to be assembly-internal (which means they are accessible from anywhere within the DLL they're declared in, but not from other assemblies).

#### C# and Java

Java and C# are similar programming languages that are statically, strongly, and manifestly typed, both are class-based object-oriented, both are designed with semi-interpretation or runtime compilation in mind, both use garbage-collection, and both are "curly brace languages" .

Java is cross platform while C# is tied to Windows although there is Mono framework for Linux.

C# is better than Java in that:

Instead of a lot of noise (EJB, private static class implementations, etc) you get elegant and friendly native constructs such as Properties and Events.

#### C# and Python

Python is winner in: ease of learning, cross platform development, availability of open source libraries

C# is winner in: standard library, language features, development process and tools, performance, language evolution speed

Roughly even: syntax (Python is better in readability, C# has more consistent syntax), adoption.

#### C# and PHP

PHP is popular and modern cross-platform common and scripting language. Web developers will tend to favor PHP (or Ruby or Python) since historically its cheaper to run as it didn't require a Windows Server but have some inherited design flows. C# is more general language and can be used for almost anything while PHP is mostly used for web.

### 11. Describe the difference between C# and .NET Framework.

C# is a programming language while .NET Framework is an application framework library.

The .NET Framework is a software framework developed by Microsoft that runs primarily on Microsoft Windows. It includes a large library and provides language interoperability (each language can use code written in other languages) across several programming languages.

Programs written for the .NET Framework execute in a software environment (as contrasted to hardware environment), known as the Common Language Runtime (CLR), an application virtual machine that provides services such as security, memory management, and exception handling. The class library and the CLR together constitute the .NET Framework.

The .NET Framework's Base Class Library provides user interface, data access, database connectivity, cryptography, web application development, numeric algorithms, and network communications. Programmers produce software by combining their own source code with the .NET Framework and other libraries. The .NET Framework is intended to be used by most new applications created for the Windows platform.