APPLICATION DEVELOPMENT TOOLS

Practical-1
Introduction

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AIM OF PRACTICAL-1

1. What is IDE? Give its examples and advantages.

2. What is GUI?

3. What types of applications can be developed by using Visual studio?

4. Which languages are supported by Visual studio?

5. List down .NET Framework versions and Visual studio version.

6. List out the features of Visual studio and new features of Visual studio 2012.

7. Compare Visual studio with other IDE.

8. Write advantages of C# language over other languages.

What is .NET ?

Microsoft.NET is a Framework

– Microsoft .NET is a Framework which provides a common platform to Execute or, Run the applications developed in various programming languages.

– Microsoft announced the .NET initiative in July 2000.

– The main intention was to bridge the gap in **interoperability** between services of various programming languages.

.NET Objectives

- **The .NET Framework is designed to fulfill the following objectives:**

  – Provide object-oriented programming environment

  – Provide environment for developing various types of applications, such as Windows-based applications and Web-based applications

  – Code Reusability

  – Platform Independence

  – Supports multiple languages

IDE

- An integrated development environment (IDE) is a software application that provides facilities to computer programmers for software development.

- An IDE normally consists of a source code editor, automation tools, and a debugger. Most modern IDEs have intelligent code completion.

- Some IDEs, such as Net Beans and Eclipse.

IDE

- Sometimes a version control system or various tools to simplify the construction of a Graphical User Interface (GUI), are integrated. Many modern IDEs also have a class browser, an object browser, and a class hierarchy diagram, for use in object-oriented software development.

Advantages and Disadvantages of IDE

➢ Advantages: -

• Less time and effort

• Enforce project or company standards

• Project management

➢ Disadvantages:-

• Learning curve

Graphical User Interface

➢ **GUI**:-

• It is a human-computer interface (i.e., a way for humans to interact with computers) that uses windows, icons and menus and which can be manipulated by a mouse (and often to a limited extent by a keyboard as well).

• GUIs stand in sharp contrast to command line interfaces (CLIs), which use only text and are accessed solely by a keyboard. The most familiar example of a CLI to many people is MS-DOS. Another example is Linux when it is used in console mode (i.e., the entire screen shows text only).

Types of Applications

- ✓ Console Applications
- ✓ Windows Services
- ✓ Client/ Desktop Applications
  - • Win Forms
  - • WPF
- ✓ Server/ Web Applications
  - • ASP.NET Web Forms
  - • ASP.NET MVC
  - • XML Web Services
  - • WCF Services
- ✓ Win Store Apps
- ✓ Smart Device Applications

Types of Applications

✓ **Console Applications:** A console application, in the context of C#, is an application that takes input and displays output at a command line console with access to three basic data streams: standard input, standard output and standard error.

✓ **Windows Service:** Example: Background services like driver, Remote access service

✓ **Windows Presentation Foundation:** Graphical subsystem by Microsoft for rendering user interfaces in Windows-based applications.

• **Features:** 3D graphics, Data binding, Media services, Animation, Effects etc.

• **Example :** XAML – Creates User Interface such as controls, shapes, text, and other content presented on the screen

Cont…

ASP.Net MVC (Model View Controller) :

- MVC patterns separate input, processing and output of an application

- Model is responsible for maintaining application data and business logic.

- View is a user interface of the application, which displays the data.

- Controller: it is really the heart of the MVC, the intermediary that ties the Model and the View together, it takes user input, manipulates the model & causes the view to update

✓ **WCF: Windows Communication Foundation**

- It is unified framework for creating secure, reliable, transacted, and interoperable distributed applications.

Languages used to develop .Net Application

- ✓ Visual C#
- ✓ VB.Net
- ✓ VC++.Net
- ✓ F#
- ✓ JavaScript
- ✓ Java
- ✓ HTML
- ✓ Python
- ✓ Ruby

- ✓ PowerShell
- ✓ SQL
- ✓ JSON
- ✓ XML
- ✓ PHP
- ✓ Go
- ✓ R
- ✓ Perl

Features of vs

- [Develop:](#) Navigate, write, and fix your code fast.

- [Debug:](#) Debug, profile, and diagnose with ease.

- [Test:](#) Write high-quality code with comprehensive testing tools.

- [Collaborate:](#) Use version control, be alert, collaborate efficiently

New features of vs 2012

- ➢ **Windows Store Apps**
- • Debugging, optimizing, and publishing Windows Store apps
- • Testing, optimizing, and publishing Windows Phone apps
- ➢ **Visual Studio IDE**
- • Projects and Solutions
- • Window Management
- ➢ **ASP.NET 4.5 and Web Development**
- • ASP.NET 4.5 Web Forms
- • General Enhancements for Web Development
- • IIS Express for Web Development
- • ASP.NET Web API

Comparison with other IDE

Category	Visual Studio	other IDE(Net Beans)
>Operating System	Windows	WindowsMac OS
		Mac OS
	Linux	Linux
	Cross-Plateform	
>Progrmming Language	C#	JAVA
	C++	
>Difficulty Level	Advance	Master
>Scripting Language	All	C#/C++
		PHP
		JAVA
		JAVA SCRIPT

Advantages of C# with other language

- C# is pure object-oriented, but C++ is a mixture of object-oriented and procedure-oriented.

- C# is more type safe

- You need not put much attention on such problems as memory leak, which is troubling problem for C++ programmer.

- Ease-to-development, the rich class library makes many functions easy to be implemented.

- Cross-platform. your application will run well only if the machine installed the .NET framework.

- Good support for distributed system.

.NET Framework
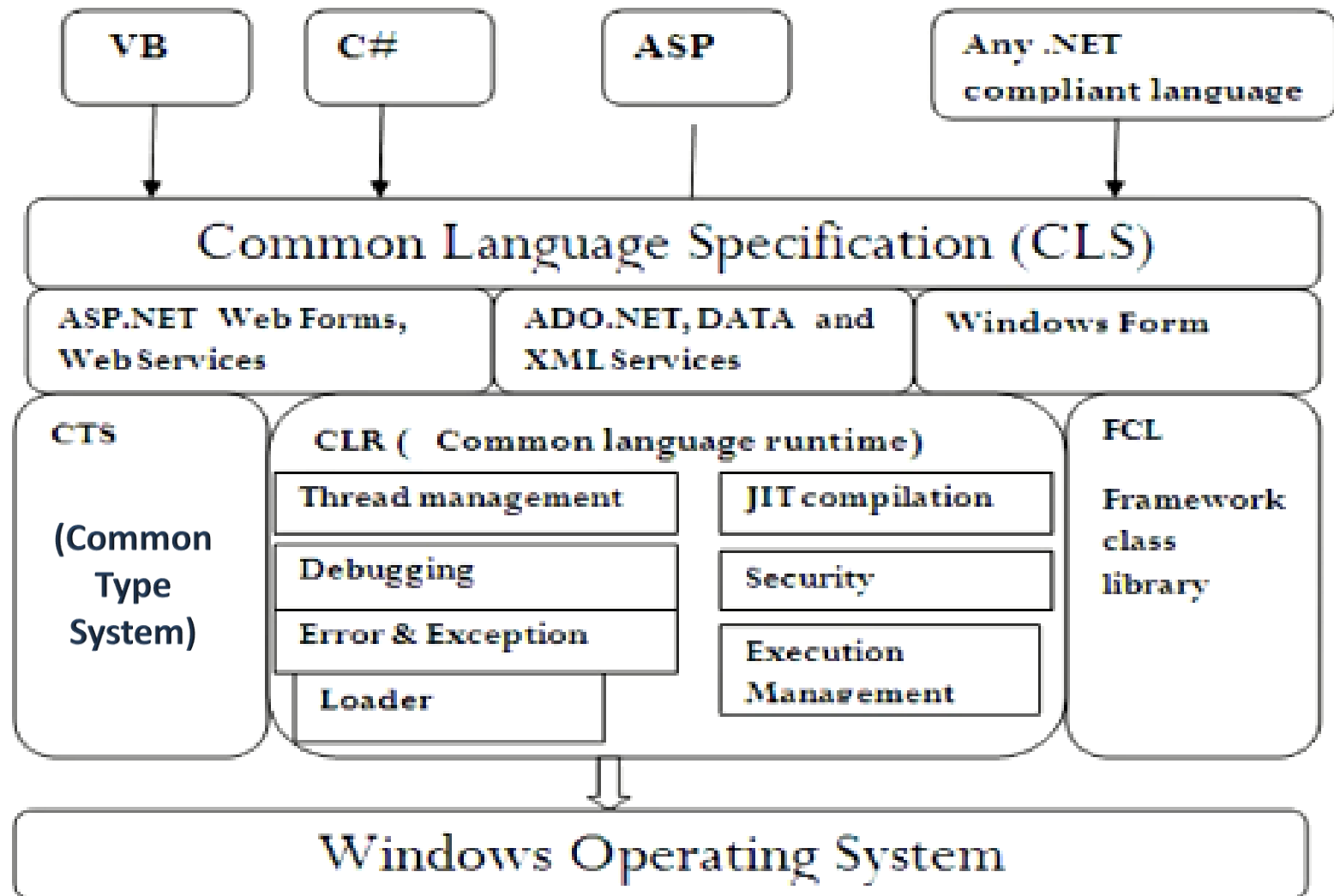
Components of .NET Framework

1. Common Language Runtime (CLR)
2. .Net Framework Class Library (FCL)
3. Common Type System (CTS)
4. Common Language Specification (CLS)

Execution in CLR

Microsoft Intermediate Language (MSIL):

- Known as intermediate Language (IL) or Common Intermediate Language (CIL).
- During compile time, the compiler convert the source code into MSIL.
- MSIL is CPU/Language independent set of instructions.
- It includes instructions for loading, storing, initializing & calling methods on objects, as well as instructions for arithmetic and logical operations, control flow, direct memory access, exception handling, and other operations.
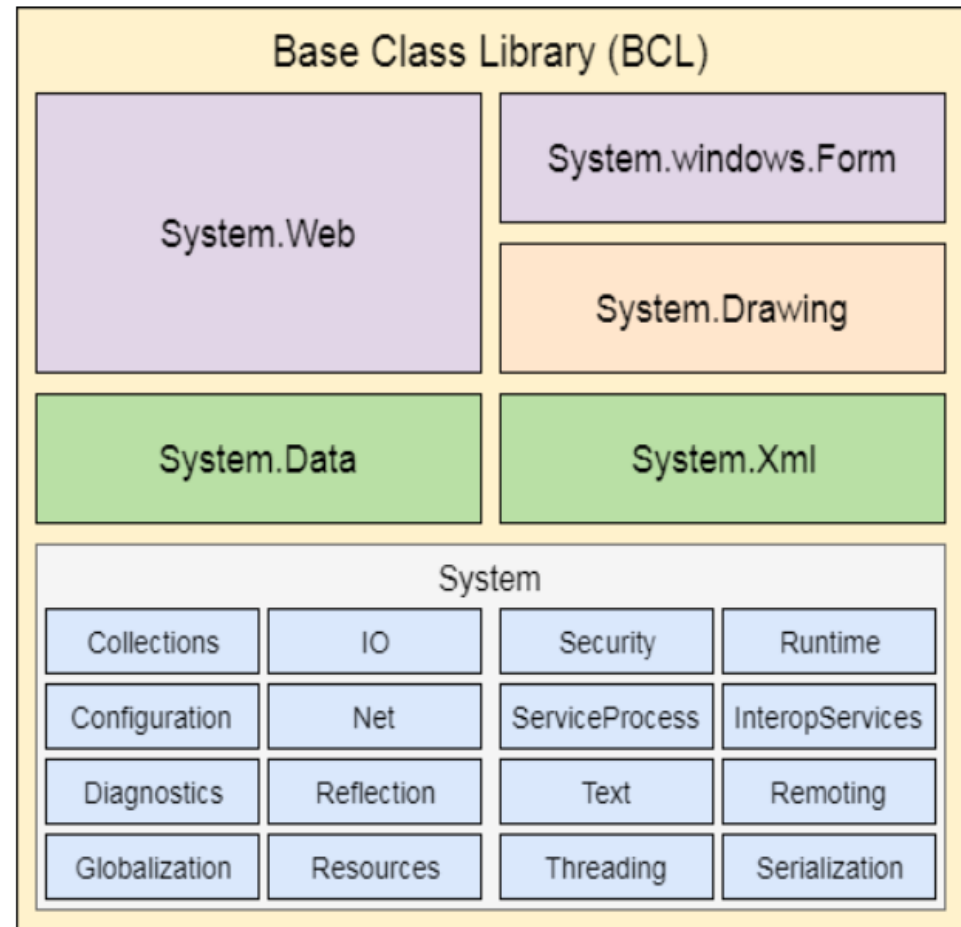- Generates the required metadata.
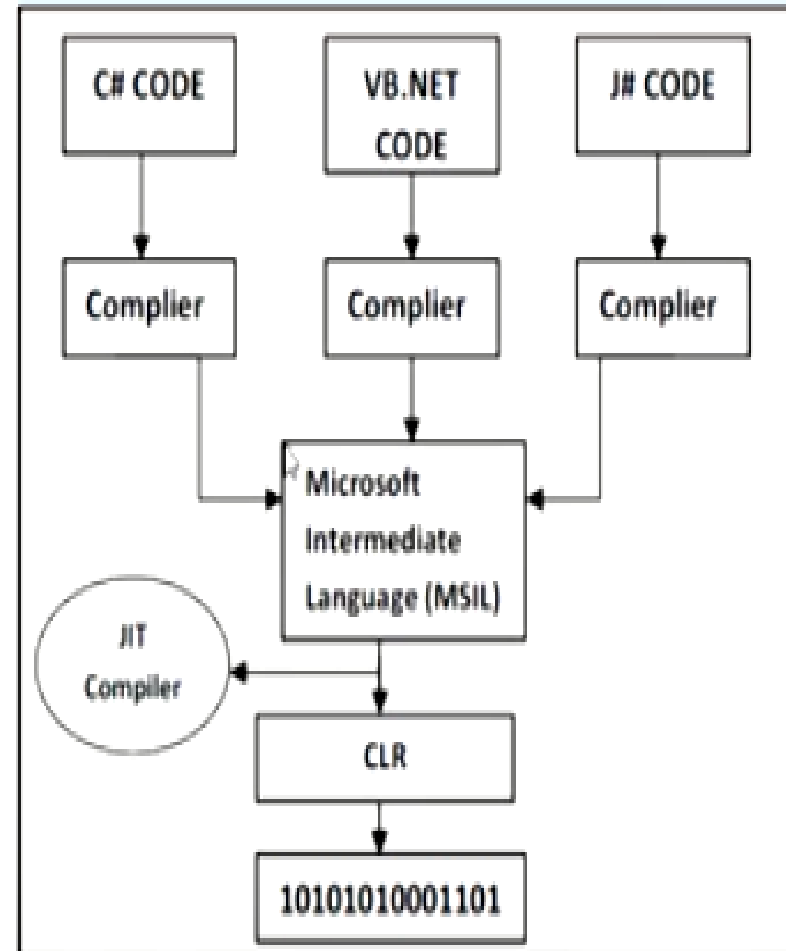
.NET Framework Class Library

- .NET Framework Class Library is the collection of classes, namespaces, interfaces and value types that are used for .NET applications.

- It contains thousands of classes that supports the following functions.

    1. Base and user-defined data types
    2. Support for exceptions handling
    3. input/output and stream operations
    4. Communications with the underlying system
    5. Access to data
    6. Ability to create Windows-based GUI applications
    7. Ability to create web-client and server applications
    8. Support for creating web services

.NET Framework Class Library

.NET Framework Base Class Library:

- .NET Base Class Library is the sub part of the Framework that provides library support to Common Language Runtime to work properly.

- It includes the System namespace and core types of the .NET framework.

Base Class Library (BCL)	
System.Web	System.windows.Form
	System.Drawing
System.Data	System.Xml

System			
Collections	IO	Security	Runtime
Configuration	Net	ServiceProcess	InteropServices
Diagnostics	Reflection	Text	Remoting
Globalization	Resources	Threading	Serialization

Visual Studio

Microsoft has introduced **`Visual Studio.NET`**, which is a tool (also called Integrated Development Environment) for developing .NET applications by using programming languages such as **`VB, C#, C++ and J#.`** etc.

.NET Framework and Visual Studio

- .NET Framework is far different from Visual Studio.

- .NET Framework is the "Engine" on which the .NET applications run. A .NET application cannot run on any machine unless it has .NET Framework installed.

- Visual Studio is an editor that helps you write .NET programs.

- .NET applications can be written without using Visual Studio.

- We can call compiler commands from command prompt, and also can use NOTEPAD to write .NET applications.

Example

- If you are a developer, you will probably install Visual Studio on your computer so that you can easily write code and compile.

- When you install Visual Studio, it automatically installs .NET Framework on your computer so that you can compile and execute your applications.

- When you deploy your application on a client's computer, you will need to install only the .NET Framework on the computer.

- All .NET applications can execute on a computer without having the Visual Studio installed on that machine.

Questions and Comments