

CO550 – Web Applications

Unit 1 - Intro to Server Side
Programming



Module Plan

- Learning objectives
- ASP.NET tutorials
- Assignment Schedule
- Logbook



HISTORICAL PERSPECTIVE

- Static Websites and HTML
- Client Side Scripting and JavaScript
- Some Dynamic Web Applications

- Databases in Web Applications and SQL
- Server Side Scripting
- Client / Server Technology

Client Side Technology: HTML

- HyperText Markup Language
- Current version is ...
- Uses pairs of tags (elements)
- Creates the application interfaces
- Provides an ability to navigate between pages
- Provides a means of capturing data via forms

Client Side Technology

- Downloaded to the client machine
- Executed by the client browser
- HyperText Markup Language
- Formatting language (CSS)
- Interface, Navigation, Data Capture
- Common client side scripting languages
 - JavaScript (heard of jQuery?)
 - VBScript (only kidding!)
- Uses
 - Validation of data entered into forms

Server Side Scripting

- Executed on server
- Provides connectivity to databases
- Implements the systems business logic
- Generates dynamic web pages
- Examples are ASP, PHP, Python, etc...

Interacting With Databases

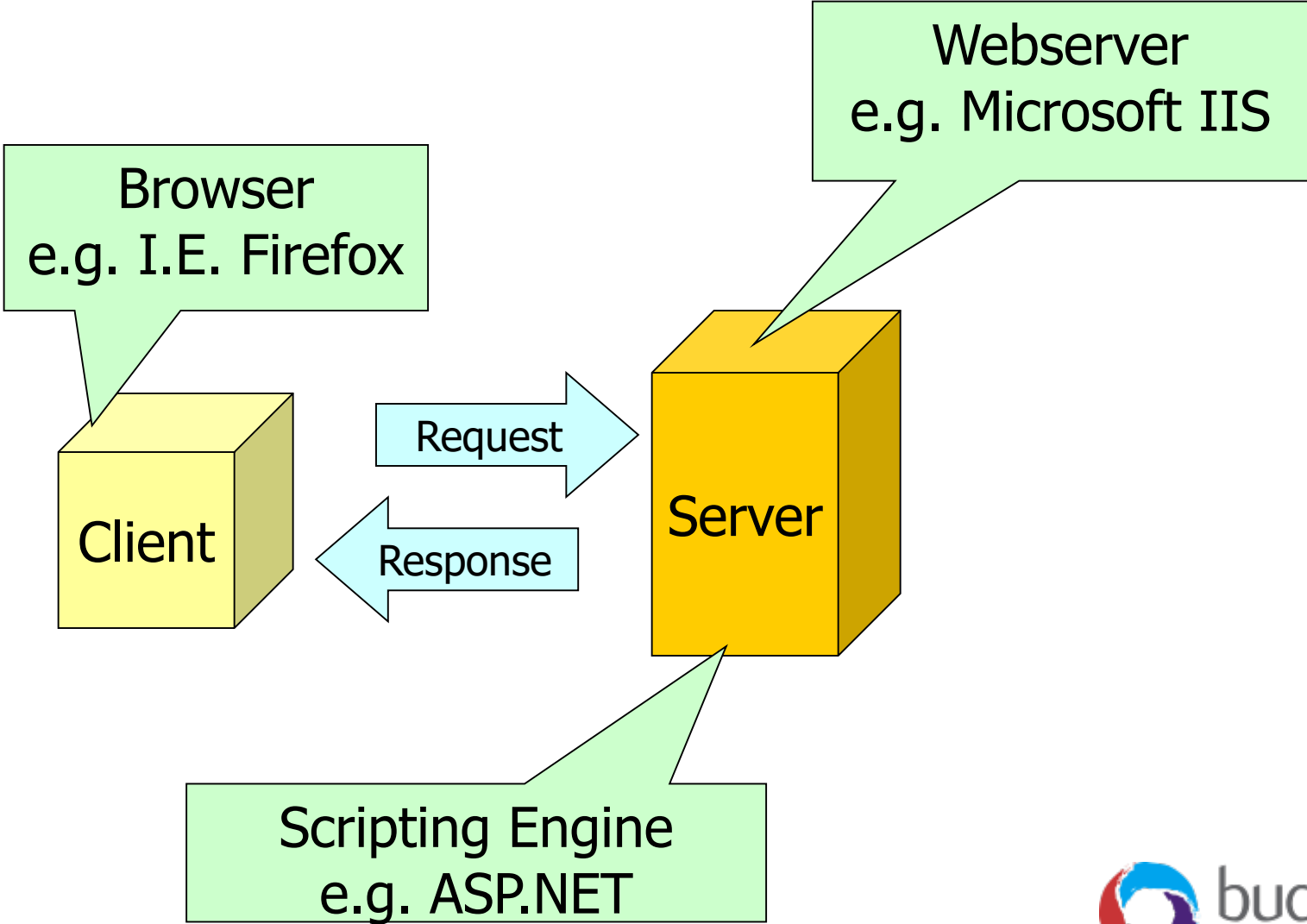
A key characteristic of web applications is that they interact with databases.

In our case ASP scripts and .NET environment will be responsible for carrying out the typical database interactions:

- retrieving records from tables in database
- updating, inserting and deleting records

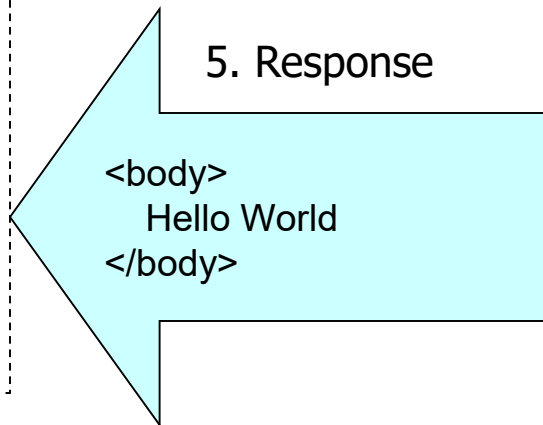
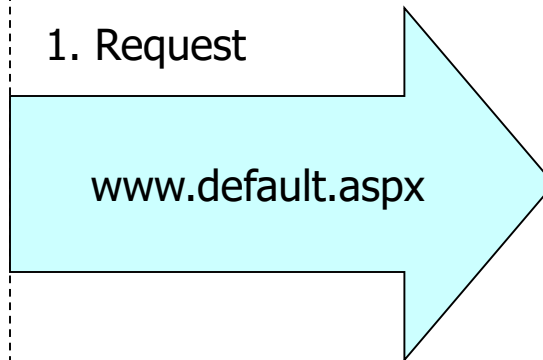
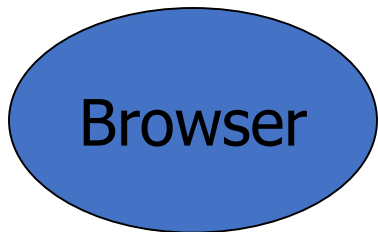
It is also possible to write scripts that create tables dynamically.

The Architecture

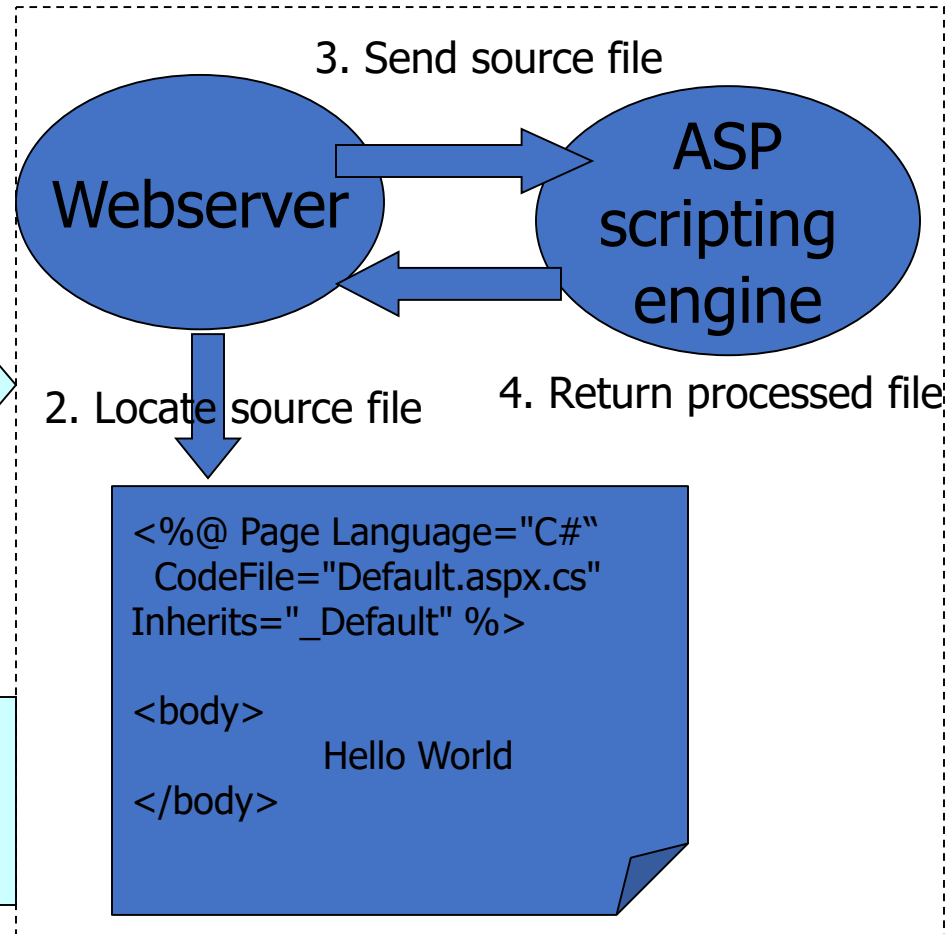


Client Server Interaction

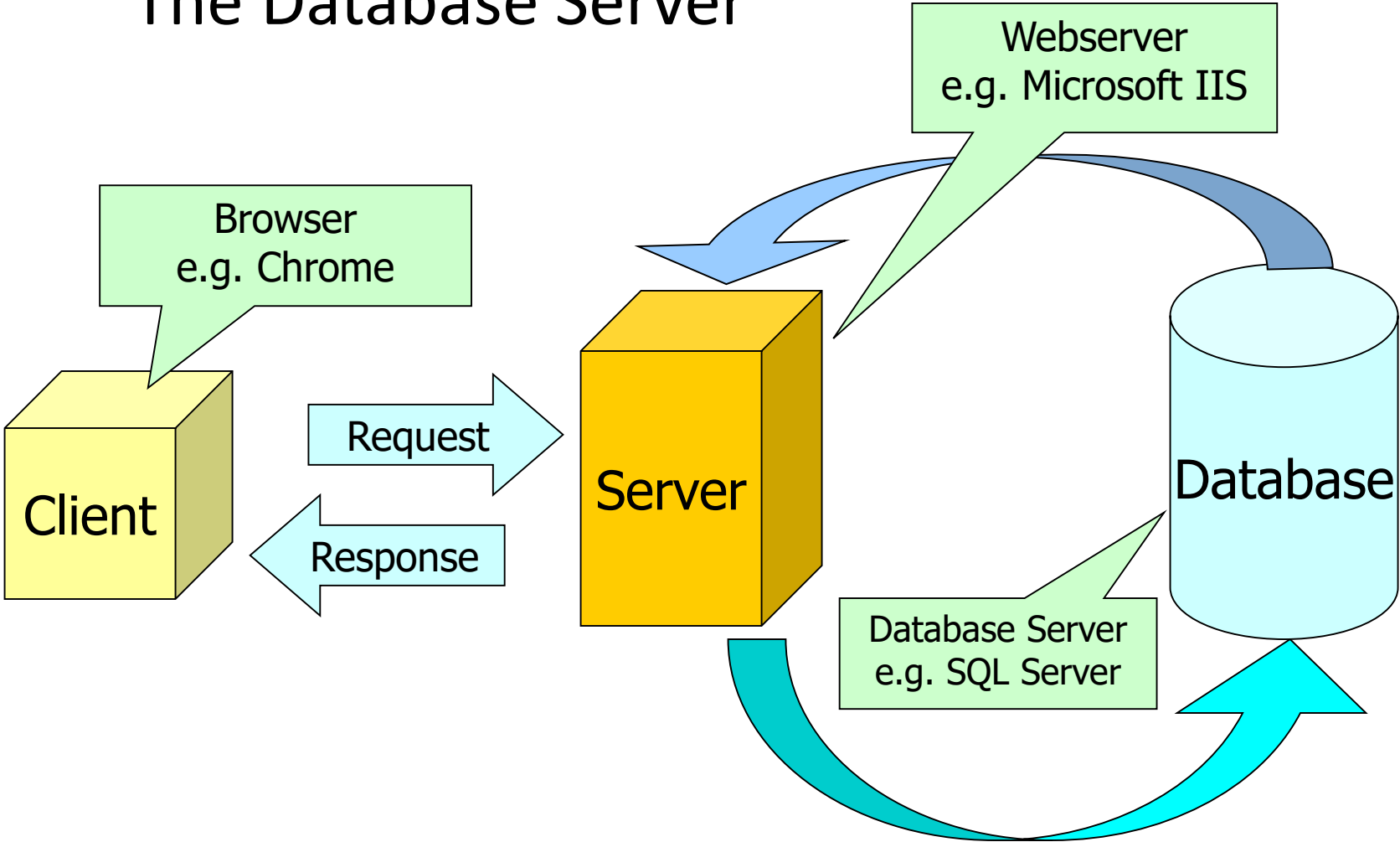
Client



Server



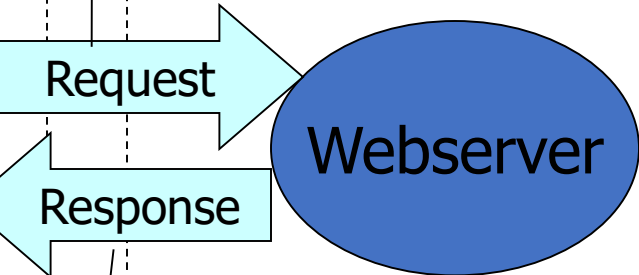
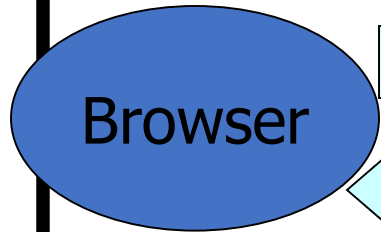
The Database Server



**Request for
www.MyWebsite.com/default.aspx**

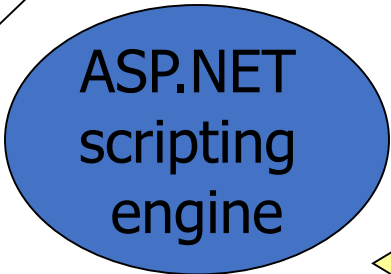
Client

Web Server

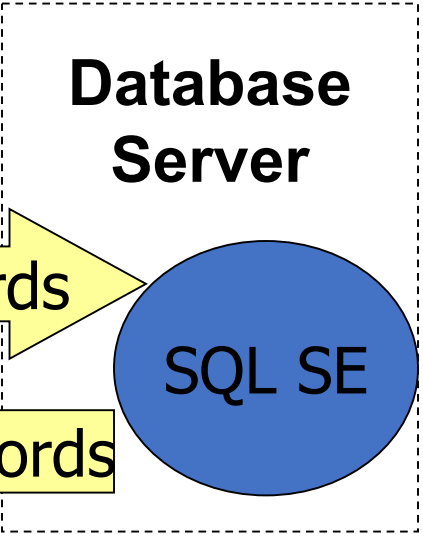


**Response
HTML page**

**HTML page
containing
details**

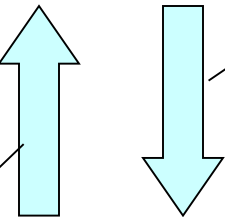


**Send default.aspx to
ASP.NET engine**

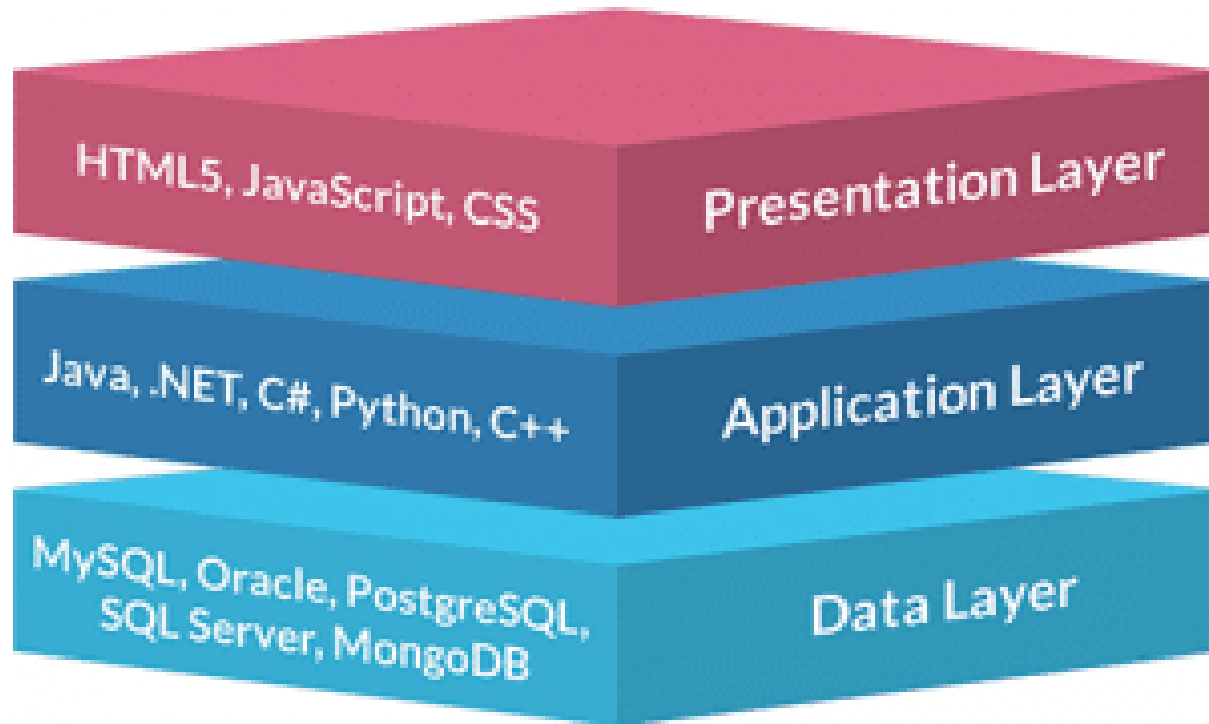


Select Records

Return Records



3-tier architecture



Source: <https://www.jinfonet.com/resources/bi-defined/3-tier-architecture-complete-overview/>

Dynamic Web Page

The screenshot shows a browser window with multiple tabs open. The active tab is Amazon.co.uk. The page displays the product details for 'UML Distilled: A Brief Guide to the Standard Object Modeling Language (Addison-Wesley Object Technology Series) 3rd Edition, Kindle Edition' by Martin Fowler. The product is available in Kindle Edition for £20.09. The page also shows the author's name, ratings, and a 'Buy now' button. The Amazon.co.uk logo and navigation menu are visible at the top. The bottom of the page shows the Windows taskbar with the date 27/09/2019 and time 18:47.

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A BRIEF GUIDE TO THE STANDARD
OBJECT MODELING LANGUAGE

MARTIN FOWLER

Forewords by Chris Kobryn, Grady Booch,
Ivar Jacobson, and Jim Rumbaugh

UML

OBJECT TECHNOLOGY
SERIES

BOOCH
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RUMBAUGH

UML Distilled: A Brief Guide to the Standard Object Modeling Language (Addison-Wesley Object Technology Series) 3rd Edition, Kindle Edition

by Martin Fowler (Author)

★★★★☆ 37 ratings

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ASP.NET

ASP.NET CORE vs ASP.NET

ASP.NET Core	ASP.NET
Build for Windows, macOS, or Linux	Build for Windows
Razor Pages is the recommended approach to create a Web UI as of ASP.NET Core 2.x. See also MVC , Web API , and SignalR .	Use Web Forms , SignalR , MVC , Web API , WebHooks , or Web Pages
Multiple versions per machine	One version per machine
Develop with Visual Studio, Visual Studio for Mac , or Visual Studio Code using C# or F#	Develop with Visual Studio using C#, VB, or F#
Higher performance than ASP.NET	Good performance
Choose .NET Framework or .NET Core runtime	Use .NET Framework runtime

Source: <https://docs.microsoft.com/en-us/aspnet/core/fundamentals/choose-aspnet-framework?view=aspnetcore-2.1>

ASP.NET Framework

A collection of several technologies:

- The .NET Languages
- The Common Language Runtime (CLR)
- The .NET Framework class library

The .NET Languages

- .NET environment supports many Microsoft languages:
 - Visual Basic,
 - C#,
 - F#,
 - C++
 - ASP
- However, third-party developers have created many more

The Common Language Runtime (CLR)

- the engine that executes all .NET programs
- provides automatic services for these applications, such as:
 - security checking
 - memory management
 - Optimization
- More info: <https://docs.microsoft.com/en-us/dotnet/standard/clr>

The .NET Framework class library

- The class library holds prebuilt functionality that you can simply add to your applications
- e.g. reading an XML file to sending an e-mail message.
- These features are sometimes organized into technology sets, such as ADO.NET (the technology for creating database applications)
- Windows Presentation Foundation (WPF, the technology for creating desktop user interfaces).



Advantages of using the class library

- Any .NET language can use library's features
- by interacting with the right objects. This helps encourage consistency among different .NET languages and
- removes the need to install numerous components on your computer or web server.
- parts of the class library are targeted directly at web development.
- Some classes aren't specific to web or Windows development.
- E.g. base set of classes that define common variable types and
- Database-type classes for data access, for example, database transactions and concurrency, ensuring multiple, simultaneous users can request the same web page at once.

ASP.NET

- This is the engine that hosts the web applications created with .NET technology,
- It supports most features found with the .NET Framework class library.
- It also includes a set of web-specific services, which include things like:
 - secure authentication
 - data storage

Visual Studio

- Powerful development tool
- Allows for rapid development of sophisticated applications
- contains a rich set of productive tools and debugging features.
- We can access the complete .NET Framework through VS
- Available on MacOS (kind of...)

Advantages of using visual studio

- Page design implemented through drag-and-drop using an integrated web form designer
- HTML system-generated, less emphasis on hand scripting
- VS automatically reports errors before applications run
- Potential problems are highlighted and solutions proposed,
- As well as traditional debugging (checking contents of variables e.g.), web apps can be debugged via built-in web server
- Intelligent code completion for recognized objects and automatically lists e.g. function parameters: Intellisense

Summary

- Web applications are web sites with business logic
- Incorporate client and server-side script
- Usually connected to database
- They generate dynamic web pages
- ASP.NET vs ASP.NET Core
- Visual Studio

Next...

- Allocate groups / pairs
- Start thinking about your project ideas
- Start reading up on Razor Pages for Unit 2