



Programming With
Microsoft Visual
Basic 2015

Introduction to VB.NET 2015

Assistant Lecturer

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مفردات المحاضرة *Outline*

Introduction:

- Computers, Information, and Information Processing
- Software vs. Hardware
- Programming Languages
- Interpreted vs. Compiled Languages

Visual Basic (VB)

- VB.NET

- Our IDE for Windows Applications: **Visual Studio.NET**

 - Introduction

 - Basic Operation

Introduction to Basic Program Design

- Basic process for program preparation

- Simple Example: 'Hello World'

 - Program design

 - Form and Controls arrangement

 - Adding code

- Running, Testing, and Saving the Program

What is a Computer?

A computer is a logical device for processing information.

Specifically, computers process data.

Data = structured information

Base: Silicon VLSI technology

VLSI = Very Large Scale Integrated circuits

Computers are Powerful!

Can perform logical computations much faster than Humans.

Current speed (desktop!): 4×10^9 basic operations/sec (GHz)

Each a simple logical operation (division, shift, write, etc)

Computers are Limited...

Computation basically sequential...

One operation at a time.

In contrast, Humans use parallel processing (by neurons).

We are better at complex tasks (e.g., Vision, Pattern Recognition)

Computers not very 'adaptive'...

Standard computers mainly do what they are told.

Communication difficult (computers think logically):

Programming languages (and programmers) required!

Software vs. Hardware

At the most basic level computers can be broken down into two components:

Hardware and Software

Hardware = the physical components of the computer system.

Data Processing: The Central Processing Unit (CPU)

Data Storage: Memory storage devices:

RAM (primary), Hard drive (secondary), flash disks (peripheral), etc

Data Communication: Devices for Input/Output:

Input: Keyboard, mouse, etc

Output: Display, printer, speaker

Software = the computer programs that run on a computer

These establish logical control over the hardware:

Manage the details of Data Processing, Storage, and Communication.

The Operating System (OS): primary system control

Windows, Ubuntu Linux, Mac OS X, Unix, etc

Application Software: MS-Word, PowerPoint, Excel, etc

User-built Applications: using a Programming Language

Computer Languages

Computer languages can be classified into 3 types:

Machine Languages:

Languages that the Computer can directly understand...

Each operation a string of digits (1's and 0's)

Machine Dependent: only usable on one platform.

Difficult for humans to freely use.

Assembly Languages:

More 'English-like': Uses words from natural languages...

Each an abbreviation for a single machine language operation.

Translated to Machine Language by special programs:

Assemblers

Still not convenient for Humans.

High-Level Languages (HLLs):

So-called Programming Languages.

Single statements can accomplish bigger tasks:

Groups of a set of related basic operations.

Much more convenient for Humans.

Programming Languages

Many Programming Languages have been developed.

Some well-known compiled High Level Languages include (older to newer):

High-Level Language	Primary Usage (General)
FORTTRAN (FORMula TRANslation)	Scientific (matrix) Calculations
COBOL (Common Business Oriented Language)	Office Computing
C	Operating System Development
Ada	Embedded Systems, Industry
BASIC (Beginner's All-purpose Symbolic Instruction Code)	Education, Windows Applications
C++	Information Processing, Engineering and Scientific Applications
JAVA	Web-based Systems, etc

Many others, including interpreted languages: **Python, Perl, Ruby, etc**
Languages allow communication between humans and computers...

This involves converting abstract **algorithms** for solving problems into a form understandable by the computer.

An '**executable**' (i.e., run-able) form.

Such a converted algorithm is called a **program**.

The people that do the conversion (at the high level) are us...the **programmers**.

Interpreted vs. Compiled Languages

Before execution, instructions in a program must also be converted:

from a text file (human-readable words in a HLL)...

...to an executable form (first to assembly, then to machine language)

Two flavors exist for this conversion process:

In advance (compiled all at once):

Conversion by a program called a 'compiler'.

Faster, but less adaptable

...better for Engineering.

'On the fly' (interpreted one instruction at a time):

Conversion by a program called an 'interpreter'.

Slower, but programs may be changed at run-time

...better for real-time Analysis and Management.

Programming languages may be of either type...

Interpreted: Python, Perl, bash scripting (linux), javascript

Compiled: C, C++, C#, and VB .NET (visual basic)

Some (JAVA, VB .NET, C#) are essentially a combination of both:

VB .NET: code first compiled into 'Common Intermediate Language'...

Visual Basic vs. VB .NET

BASIC

Beginner's All-purpose Symbolic Instruction Code

Developed as an extension of C, to be a general-purpose programming language.

Visual BASIC (VB)

BASIC + a Graphical User Interface (GUI)

Greatly eases the creation of **Windows applications**

Especially, by facilitating the use of re-usable components

Visual BASIC .NET

A programming language based on VB 6.0

Working on the **.NET framework** of the Microsoft Corporation

A Platform for cross-language development (C#, VB. NET, C++, F#)

Includes a large standard library called the **BCL** (**B**ase **C**lass **L**ibrary)

Visual Studio

Microsoft's Integrated Development Environment (IDE) for VB .NET.

Intended mainly for **Windows Applications** and **Web Applications**.

We will use **Visual Studio 2015** to create all of our programs.

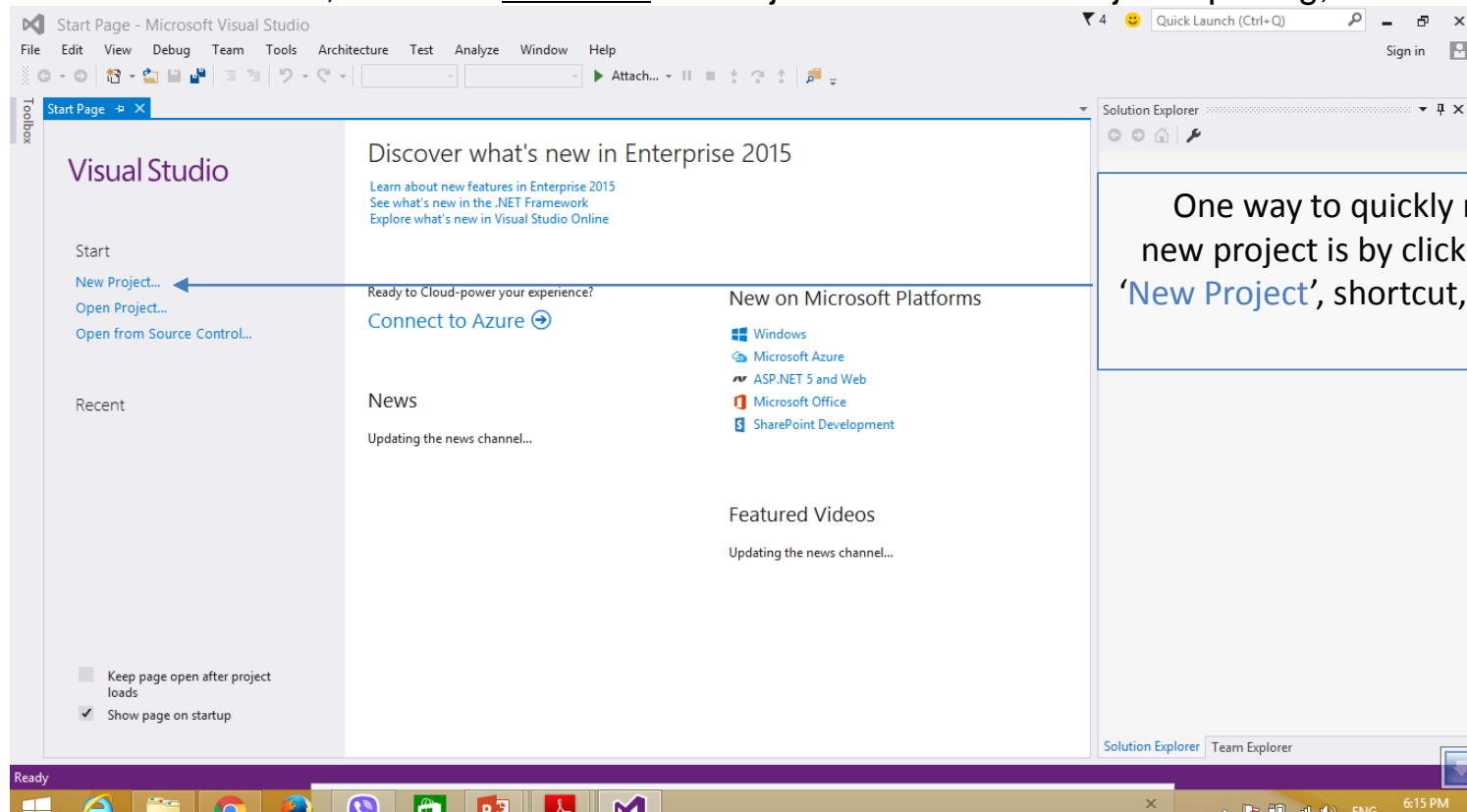
Starting Visual Studio 2015

Go to Programs > All Programs > Microsoft Visual Studio 2015 (click)

After a few moments, Visual Studio 2015 (VS 2015) should open...

With the **Start Page** shown in the central window.

As shown, there are shortcuts for Project Creation and Project Opening, here...

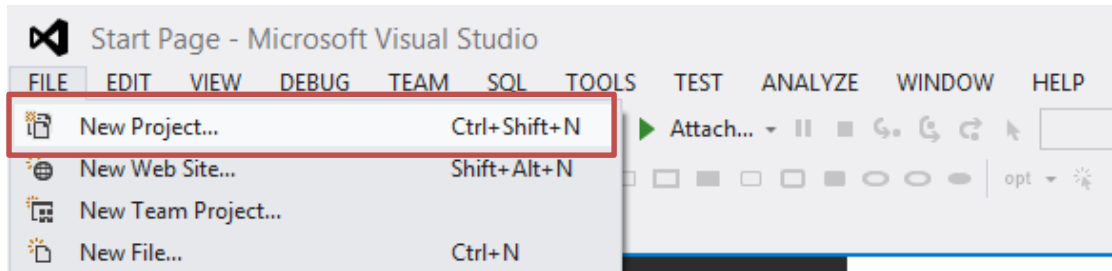


One way to quickly make a new project is by clicking the 'New Project', shortcut, here...

Creating a New Project

Instead, let's create a new Visual Basic Project using the VS Menu....:

First, open the VS 2015 Menu > File Tab and click 'New Project'...

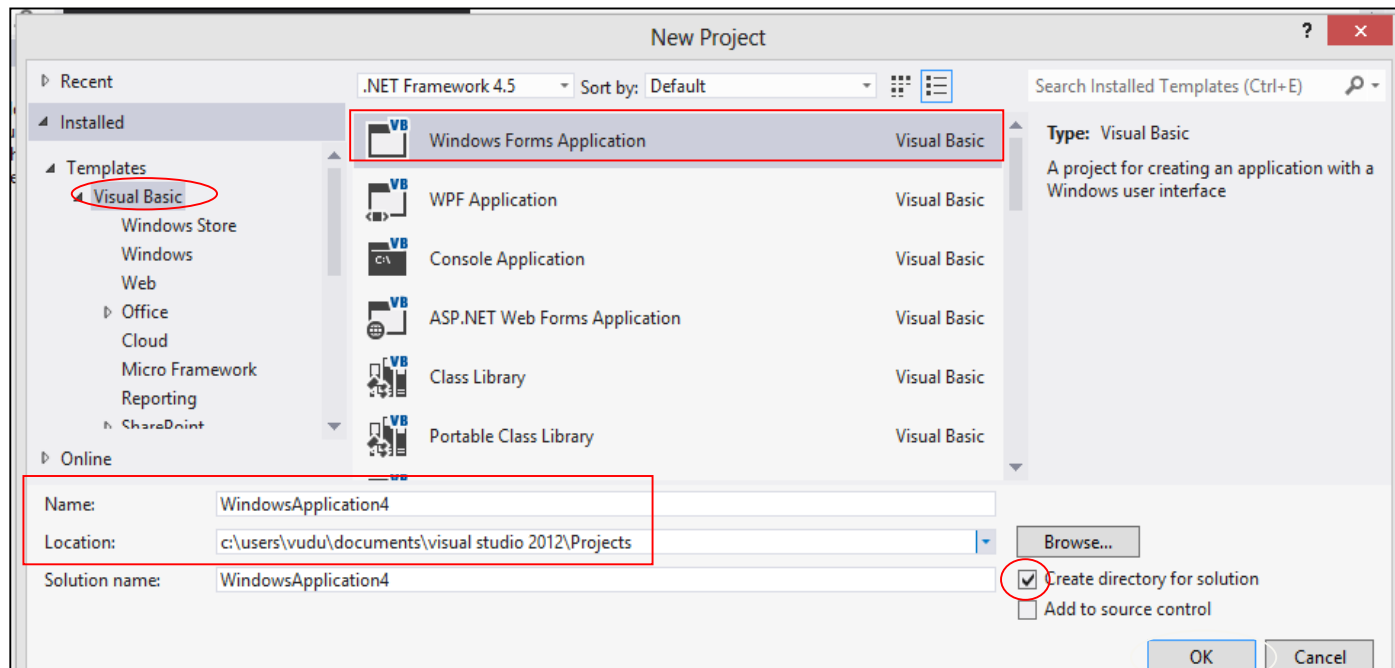


The [New Project Dialog](#) will appear (see next slide)...

Creating a New Project

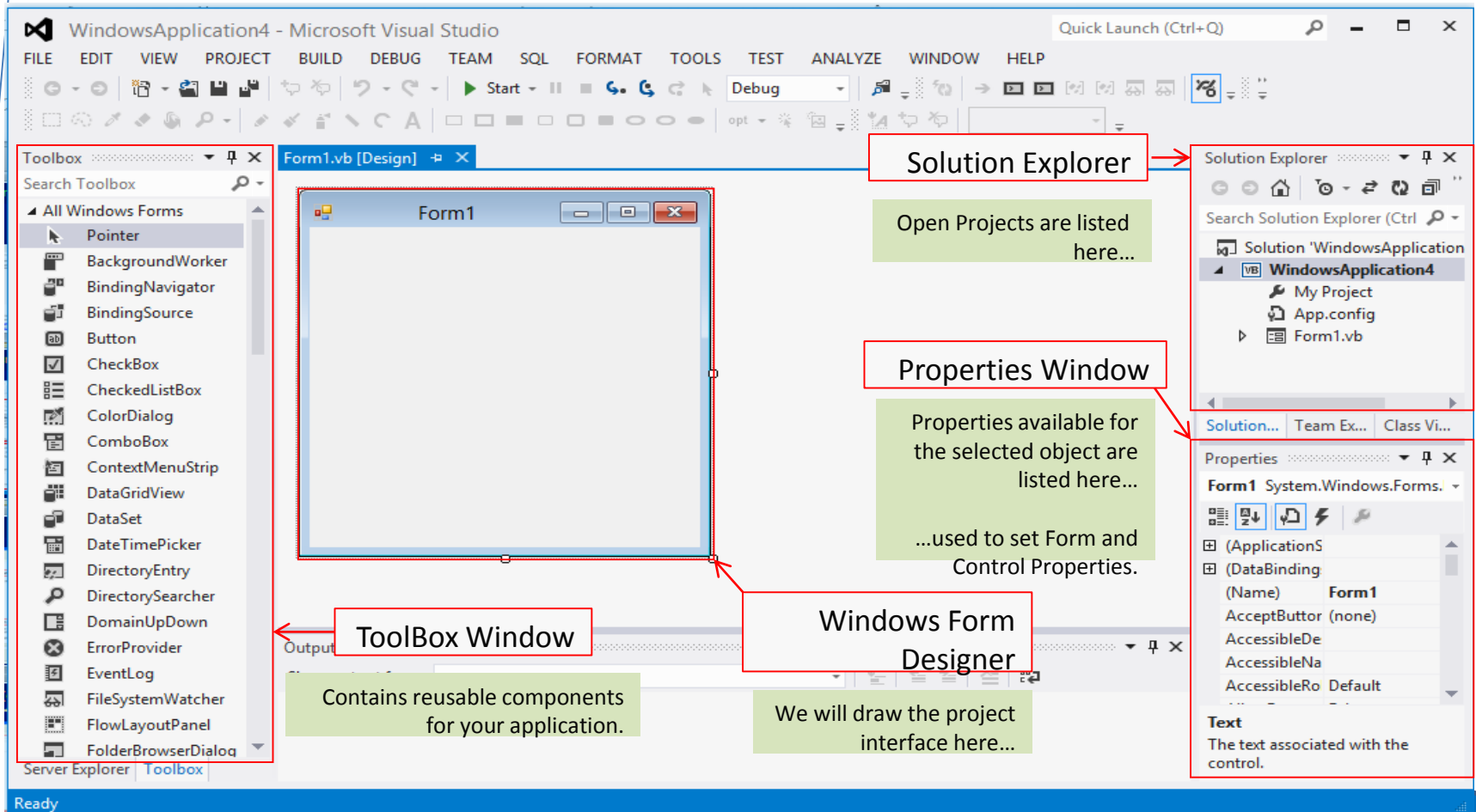
Use the 'New Project' Dialog to set the new project's type, name, etc:

1. Select the Visual Basic Templates from the left-hand window...
Then, select 'Windows Forms Application' as our project type.
2. Choose a Name and Location to store your Project; for now...
Keep the default Project Name (WindowsApplication1) and Location (later, copy to your USB)
3. Finally, make sure 'Create directory for Solution' is checked...
And press OK ...



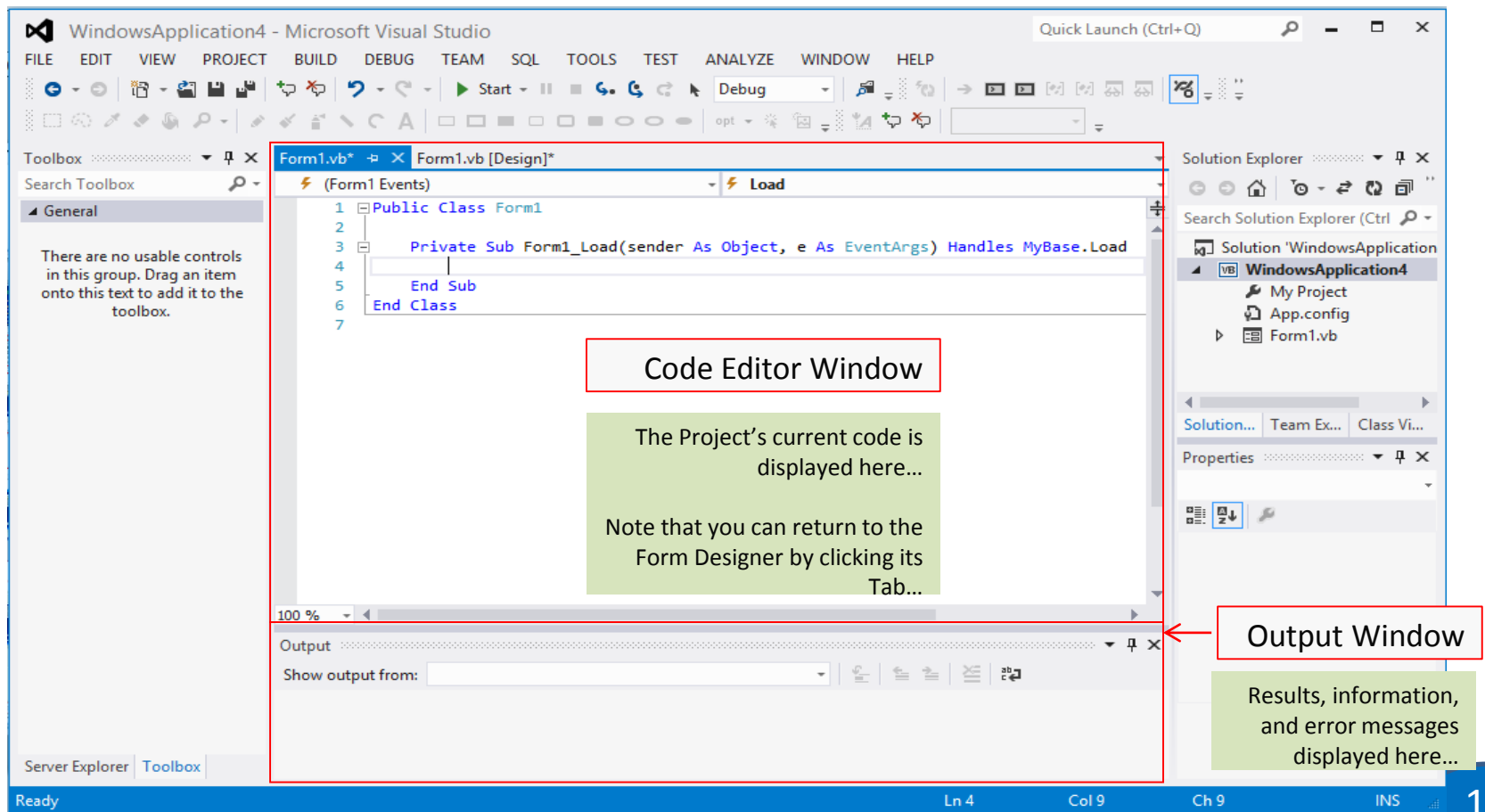
Visual Studio 2015 Main Screen

The main screen will appear:



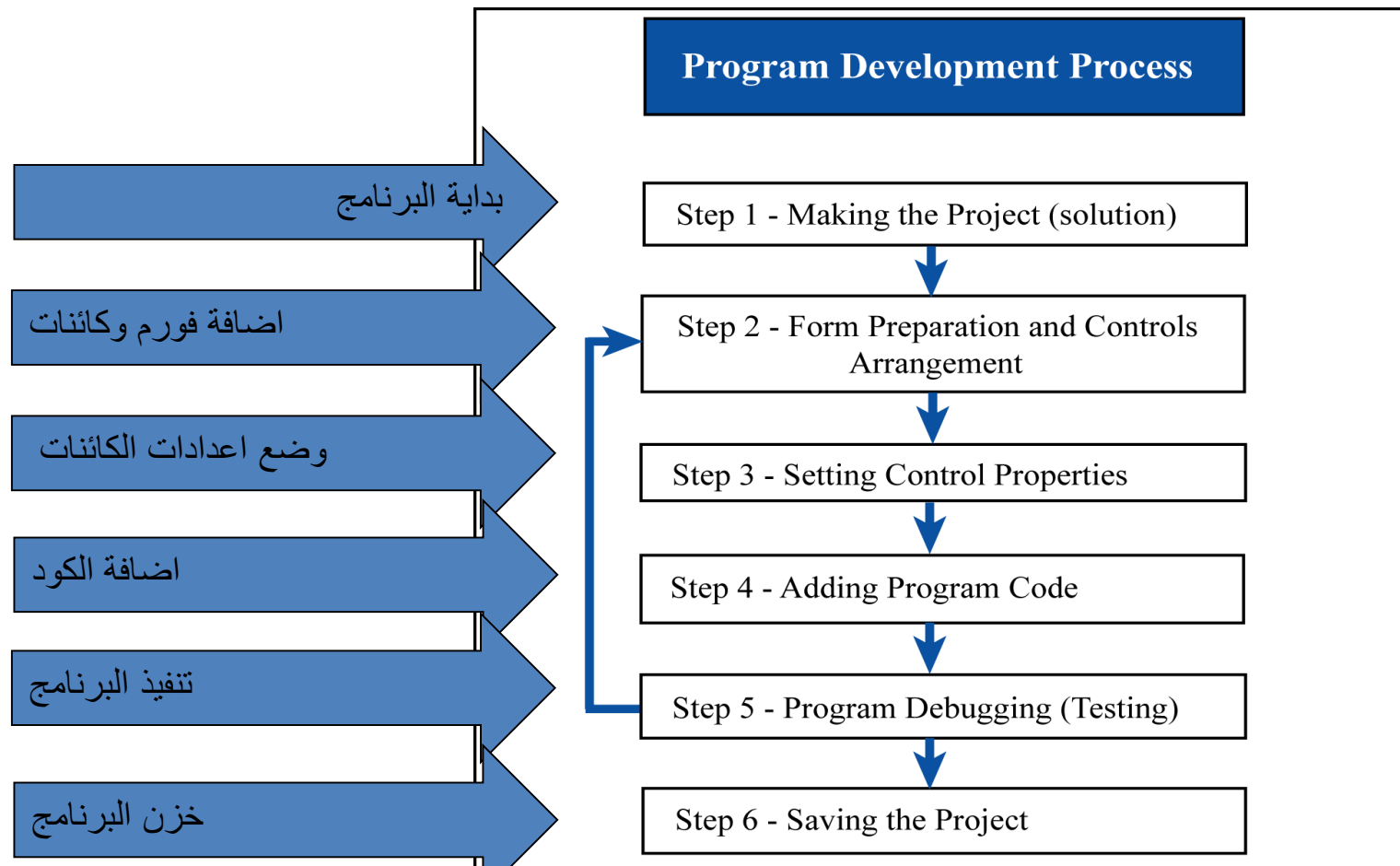
Visual Studio 2015 Main Screen

Double-clicking the Design Window brings up the Code Editor.
This shows your project's current VB code.



Flow Chart for Program Preparation

In this course, we will build VB projects by Incremental Development Process



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Thank You

A horizontal bar at the bottom of the slide. It consists of a solid blue section on the right and a lime green section on the left. A thin grey line runs along the bottom edge of the blue section.