Module 2

"Hello, World"

TEKNOLOGISK
INSTITUT

Agenda

- Anatomy of a C# Program
- Basic Input and Output in C#
- Best Practices
- Lab 2
- Discussion and Review

“Hello, World” in C#

```
using System;

namespace SimpleCSharpApp
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.WriteLine( "Hello, World from C#" );
        }
    }
}
```

Basic Structure

- A C# application can consist of many files, usually **`.cs`**-files
- A C# program consists of classes, structures, and other types
- The '**`{`**' and '**`}`**' characters are the foundational block delimiters
- The '**`;`**' character separates statements of the language, if needed
- A class is a unit of data members and "methods"
- *Classes will be treated in much more details later*

TEKNOLOGISK INSTITUT

The `Main()` Method

- The **`Main()`** method has a special meaning
  - When the program starts, **`Main()`** is executed
  - When **`Main()`** finishes execution, the program terminates
- Multiple classes can each have a **`Main()`** method
  - Designate a unique **`Main()`** as the entry point
- Declare **`Main()`** to be **`static void Main`**
- Note that C# is
  - Case-sensitive!
  - Whitespace-insensitive!

Namespaces and `using`

- .NET comes equipped with thousands of classes organized into namespaces
  - **`System`** is the main namespace with core functionality
- Classes are referred to by their namespace

```
System.Console.WriteLine( "Hello, World from C#" );
```

- Using statements brings classes into scope

```
using System;

Console.WriteLine( "Hello, World from C#" );
```

Creating a C# Project in Visual Studio

- Projects and Solutions in Visual Studio
  - Solution Explorer
    - Solutions
    - Projects
    - Files
- A brief overview of Visual Studio features and contents
  - Common development environment for
    - Programming languages
    - Project types
    - Data sources
    - …
- Compiling a simple C# program
- Locating errors
- Running programs with or without the Visual Studio debugger

Agenda

- Anatomy of a C# Program
- **Basic Input and Output in C#**
- Best Practices
- Lab
- Discussion and Review

The `System.Console` Class

- Appropriate for "Console Applications"
- Write output to the screen by
  - `Console.Write()`
  - `Console.WriteLine()`
- These methods are overloaded
- Read from the keyboard via
  - `Console.Read()`
  - `Console.ReadLine()`
- Console in fact supports colors!

Formatting Console Output

- Use **{0}**, **{1}**, **{2}** etc. as placeholders for **Console.WriteLine()**

```
Console.WriteLine(
   "My favorite number is {0}. Not {1}",
   87, 42
);
```

```
My favorite number is 87. Not 42
```

- In Module 4 we will encounter an alternate – and perhaps better – way of formatting such strings

Formatting Numerical Data

- The placeholder can be further refined by
  - '**C** 'or '**c**' Currency
  - '**D**' or '**d**' Decimal numbers
  - '**E**' or '**e**' Exponential notation
  - '**F**' or '**f**' Floating point
  - '**N**' or '**n**' Number
  - '**X**' or '**x**' Hexadecimal

```
Console.WriteLine(
   "My favorite number is {0:x}",
   87);
```

```
My favorite number is 57
```

- Precision of formatting can be specified after the format character

- Strings can be formatted in a similar fashion using **string.Format()**

```
Console.WriteLine( "Pi is {0:f2}", Math.PI );
```

Agenda

- Anatomy of a C# Program
- Basic Input and Output in C#
- **Best Practices**
- Lab
- Discussion and Review

Comments

- Remember to write your comments when you write your code!
- Single-line comments

```
// Input the user's name
Console.WriteLine( "Please input your name: " );
string name = Console.ReadLine();
```

- Multi-line comments

```
/* In the section below, we iterate through the list
   of all the elements. We then compute their values
   one-by-one before returning the overall value */
DoStuff();
```

TEKNOLOGISK INSTITUT

XML Documentation

- Use `///` to generate XML comments

```
/// <summary>
/// This is an example program for use with
/// the "Grundlæggende C# 6.0" course.
/// </summary>
class Program
{
   /// <summary>
   /// This is the entry point of the application.
   /// </summary>
   /// <param name="args">Command-line arguments
   /// supplied to the application</param>
   static void Main( string[] args )
   {
      Console.WriteLine( ... );
   }
}
```

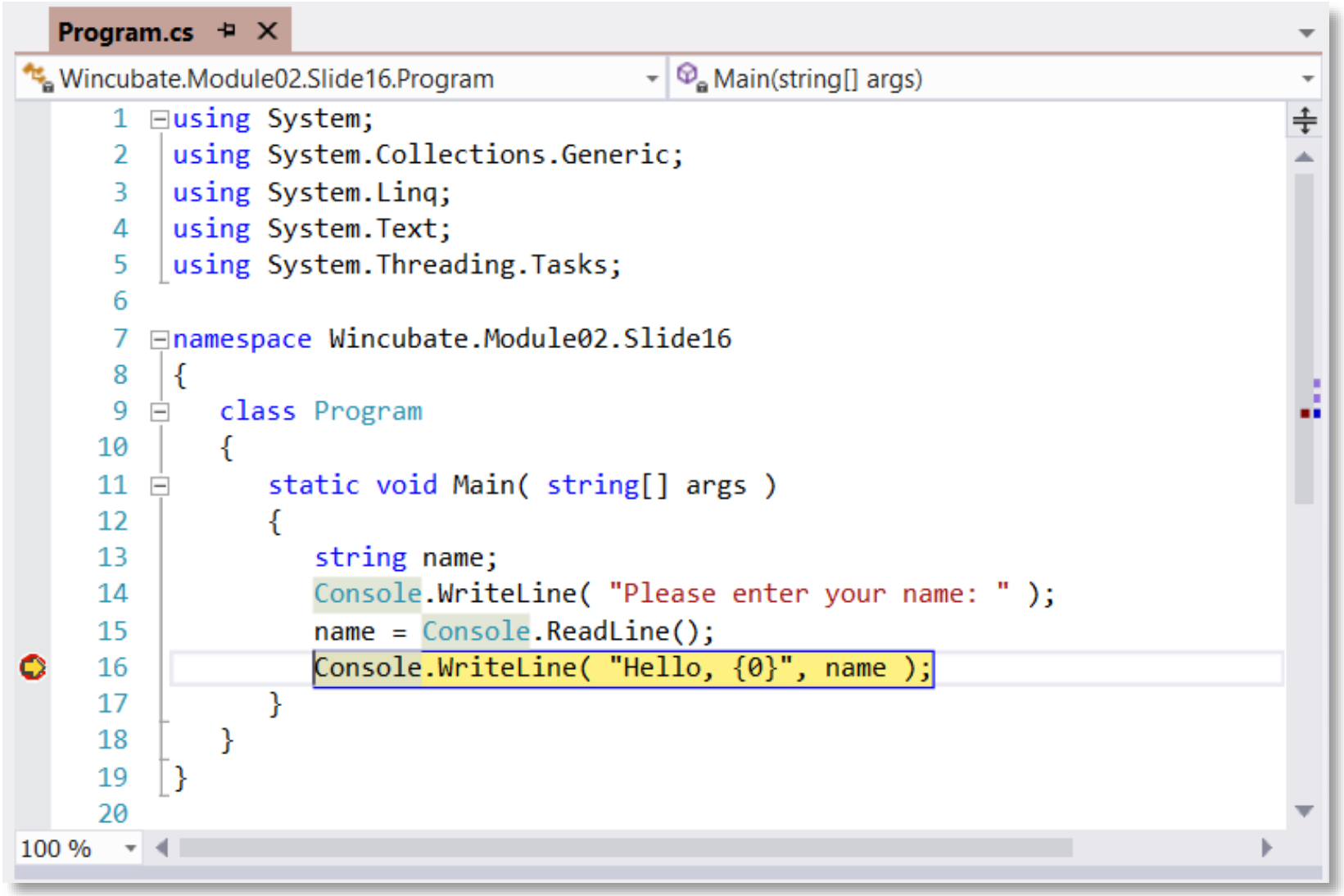
The Integrated .NET Framework Documentation System

- Extremely valuable documentation while programming
- A must to use for any programmer!

- "HELP" menu item in Visual Studio
- Press F1 on C# keyword or .NET type

TEKNOLOGISK INSTITUT

Using the Visual Studio Debugger



Customizing Visual Studio

- Tools -> Options
- Millions of commands and shortcuts
  - Shortcuts can be (re)defined at will
- Customizations
- Code Snippets
- Extensions and Updates

- Old, but still very good: "Sara Ford's Tips 'n Tricks"
  - http://channel9.msdn.com/Blogs/NicFill/Sara-Fords-101-Visual-Studio-Tips-in-55-Minutes-Challenge

- Reset everything(!) either via the UI or using
  - `devenv /ResetSettings`

TEKNOLOGISK INSTITUT

Lab 2: Creating and Debugging C# Programs using Visual Studio

Discussion and Review

- Anatomy of a C# Program
- Basic Input and Output in C#
- Best Practices


WINCUBATE
Jesper Gulmann Henriksen
PhD, MCT, MCSD, MCPD
Phone : +45 22 12 36 31
Email : jgh@wincubate.net
WWW : http://www.wincubate.net
Hasselvangen 243
8355 Solbjerg
Denmark