```
namespace HelloWorld;

internal static class Program
{
    private static void Main()
    {
        Console.WriteLine("Hello, world!");
    }
}
```

Introduction to C#

C# Fundamentals – .NET Development

Agenda

- C# Background
  - What Is C#?
  - Compilation
  - History
  - Design Principles
- C# Design
  - Language Type
  - Why Static Types?
- C# Project Structure

C# Background

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- System independent, and code can be analyzed and changed at runtime

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- *.NET Core* is the current implementation of .NET
- .NET's bytecode is called *common-intermediate-language (CIL) code*
- The virtual machine used to execute .NET applications is known as the *common language runtime (CLR)*

C# Compilation

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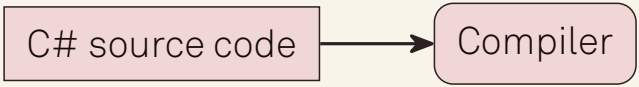
C# source code

C# Compilation



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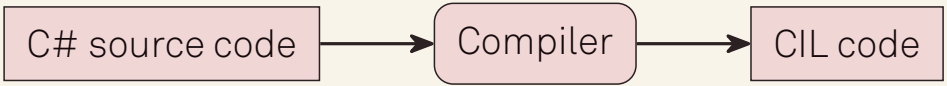

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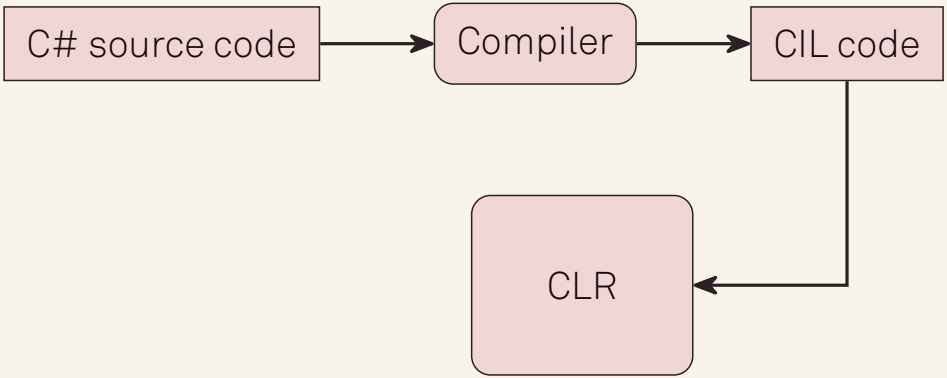

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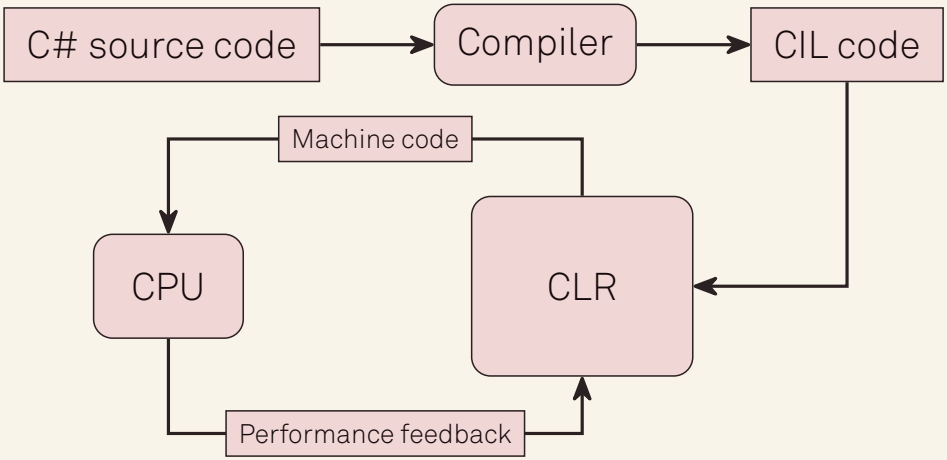

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- C# is ECMA-standardized (ECMA-334)

Design Principles

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- The language is intended to be a simple, modern, general-purpose programming language
- The language, and implementations thereof, should provide support for software engineering principles such as strong type checking, array bounds checking, detection of attempts to use uninitialized variables, and automatic garbage collection. Software robustness, durability, and programmer productivity are important.

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- Portability is very important for source code and programmers, especially those already familiar with C and C++.
- Support for internationalization is very important.

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- C# is intended to be suitable for writing applications for both hosted and embedded systems, ranging from the very large that use sophisticated operating systems, down to the very small having dedicated functions.
- Although C# applications are intended to be economical with regard to memory and processing power requirements, the language was not intended to compete directly on performance and size with C or assembly language.

C# Design

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- C# is an application programming language
  - Console apps
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  - Desktop and mobile apps (.NET MAUI)
- It's a *high-level* language compared to C and a *very high-level* language compared to Assembly language

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    - Remove details about hardware control

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  - High level (Java, Python, C#)
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    - Automated memory management (garbage collector)

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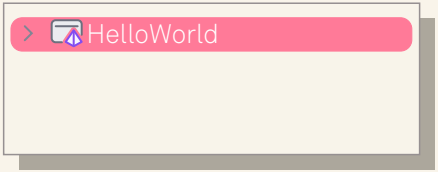
    - TypeScript/JSDoc comments

C# Project Structure

Project Structure



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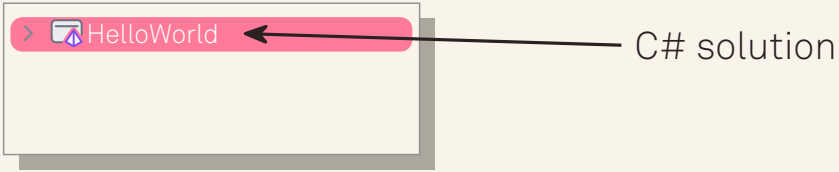

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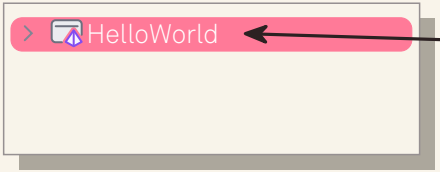
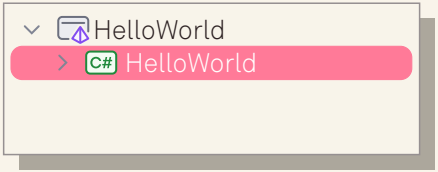


- Solutions are containers for one or more related projects

Project Structure



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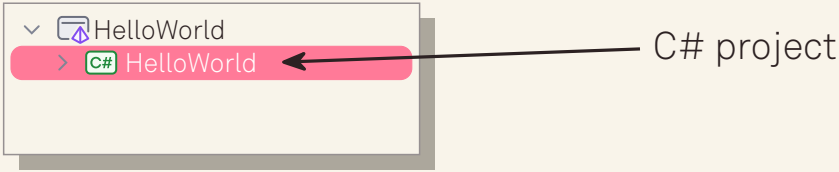
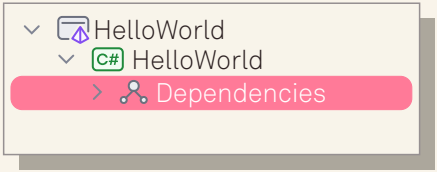


Project Structure

C# project

- Projects contain all code compiled into an executable, library, or website

Project Structure



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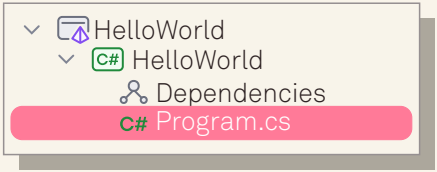

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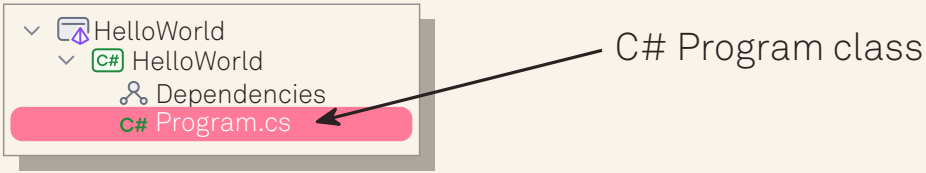

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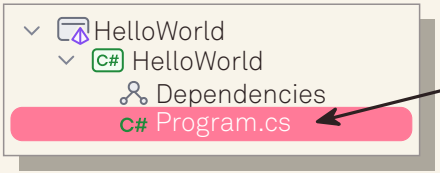

C# Program class

- This is the main class for a basic console application

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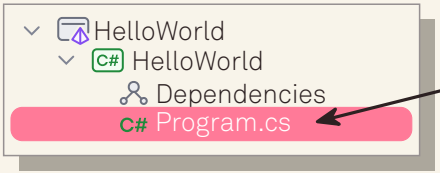

C# Program class

- This is the main class for a basic console application
- This is where the code from the title slide goes

Any Questions?