



# What's cool with C# 11 and .NET 7

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## Christian Nagel

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- Training
  - Coaching
  - Consulting
  - Development
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- Microsoft MVP
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Professional

C# and .NET

2021 5th





# Topics

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- C# Language Enhancements
- What's new?
- What's coming?
- How does it help?

# Auto Default Struct

## C# 10 added

- struct records
- with expressions with structs
- custom parameterless constructors

## C# 11 enhanced

- auto default struct





# Required Modifier

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- Nullable reference types solves problems
- Constructors adds complexity
- required: Initialize with *constructor* or *object initializer*
- Modifier for properties and fields
- *SetsRequiredMembers* Attribute on constructor

# Interface Enhancements

- C# 8 added implementation in interfaces
  - Versioning
  - Mixin functionality
- C# 11 adds static members
  - Constraints with generic types



# Generic Math

- Numeric interfaces

- INumber, IMinMaxNumber, IAdditiveIdentity, IBinaryInteger, IFloatingPoint...

- Operator interfaces

- IAdditionOperators, IBitwiseOperators, IIncrementOperators...

- Function interfaces

- IExponentialFuncations, ILogarithmicFunctions, IPowerFunctions, ITrigonometricFunctions...

- Parsing and formatting interfaces

- IParsable, ISpanParsable, IFormattable, ISpanFormattable

# Pattern Matching Enhancements

- List Patterns
  - Apply a pattern on any element in the sequence
  - Discard pattern to match any element
  - Slice pattern to match zero or more elements
- Matching on Span<T>



# Strings

- Utf8 String literals
  - U8 suffix
  - `ReadOnlySpan<byte>`
- Raw string literals
  - Three or more quotes
  - span multiple lines
  - Indentation based on end quotes
  - Combine with interpolated strings

# Native AOT Deployment

- Self-contained
- AOT compiled to native code
- Quick startup, less memory
- Can run where JIT is not allowed
- No dynamic loading
- No reflection emit
- No C++/CLI
- Requires trimming
- Compilation into a single file
- Includes runtime-libraries
- ASP.NET Core not supported (yet)

# .NET 7 Source Generators

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Logging

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Regex

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JSON Serialization

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Platform Invoke

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JavaScript Interop

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More at 7 PM





# Upgrade

- dotnet CLI upgrade-assistant
- .NET Upgrade Assistant – Extension with Visual Studio
- WPF
- ASP.NET MVC
- Libraries
- UWP to WinUI
- Xamarin.Forms to .NET MAUI

# What's next?

- Semi-auto properties (field keyword)
- Primary constructors
- params Span<T>
- lambda default parameters
- Default in deconstruction
- Collection literals
- Roles (extend everything, implement interfaces on behalf of the underling type – act as adapters)

# Summary

- What's new with C#?
- Required...interfaces...pattern matching...strings...AOT...
- Directions going forward
- Source code: <https://github.com/cnilearn/bastaspring2023>
- Blog: <https://csharp.christiannagel.com>





Questions?