

We have got the company!

- **Fruit flies** were the first living creatures to be sent into space. Lucky one!
- A **bee's** wings beat 190 times a second, that's 11,400 times a minute. OMG!
- **Caterpillars** have 12 eyes!
- One **dung beetle** can drag 1,141 times its weight – that's like a human pulling six double-decker buses!
- **Grasshoppers** existed before dinosaurs!

DotNetCore

Prepared for Vth semester DDU-CE students
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.NET Core

- .NET Core is a *software development framework* which is used to create different types of applications.
- There are many frameworks which are written on top of .NET Core for creating various applications.
- .NET Core is a **cross-platform**, **high-performance**, **open-source** framework for building modern, cloud-based, internet-connected applications.

Benefits and Features

Cross Platform

Unified
programming
model for MVC
and Web API

Dependency
Injection

Testability

Open Source

Modular

Command line tool
support

Cross Platform

- ASP.NET 4.x applications → windows platform
- .NET Core applications can be **developed** and **run** across different platforms like Windows, macOS, or Linux.
- ASP.NET 4.x applications can be hosted only on IIS.
- .NET Core applications can be hosted on IIS, Apache, Docker, or even self-host in your own process.
- From a development standpoint, you can either use Visual Studio or Visual Studio Code, Sublime, Bracket, Vim, Etc... for building .NET Core applications.

Unified programming model

- With ASP.NET core, we use the same unified programming model to create MVC style web applications and ASP.NET Web API's.

Dependency Injection

- ASP.NET Core has built-in support for dependency injection.

Testability

- With built-in dependency injection and the unified programming model for creating Web Applications and Web API's, unit testing ASP.NET Core applications is straight forward.

Open-source and community-focused

- <https://github.com/dotnet/core>
- ASP.NET Core is fully open source and is being actively developed by the .NET team in collaboration with a vast community of open source developers.
- ASP.NET Core is continually evolving as the vast community behind it is suggesting ways to improve it and help fix bugs and problems.
- This means we have a more secure and better quality software.
- MIT Licence (Private and Commercial use)

Modular HTTP Request Pipeline

- ASP.NET Core Provides Modularity with Middleware Components in ASP.NET Core
- We compose the request and response pipeline using the middleware components.
- It includes a rich set of built-in middleware components.
- We can also write our own custom middleware components.

Command line tool support

- .NET Core fully supports command line tool which is useful in complete cycle of development.
 - Create new project
 - Add package
 - Build
 - Run
 - Test
 - Deploy
 - Etc...

.NET Core CLI

- .NET CLI helps us to perform almost all the tasks which are required in order to work with .NET Core application.
- .NET CLI works with the command and these commands are applicable on all types of application of .NET Core.
- .NET CLI is a cross platform tool for developing .NET applications.

Download .NET

- <https://dotnet.microsoft.com/download>

Windows

Linux

macOS

Docker

.NET Core

.NET Core 3.1

.NET Core is a cross-platform version of .NET for building websites, services, and console apps.

Run Apps ⓘ

Download .NET Core Runtime

Build Apps ⓘ

Download .NET Core SDK

Advanced ⓘ

All .NET Core downloads...

.NET Framework

.NET Framework 4.8

.NET Framework is a Windows-only version of .NET for building any type of app that runs on Windows.

Run Apps ⓘ

Download .NET Framework Runtime

Build Apps ⓘ

Download .NET Framework Dev Pack

Advanced ⓘ

All .NET Framework downloads...

Let's Rain...

```
Command Prompt

C:\Users\AAM>dotnet

Usage: dotnet [options]
Usage: dotnet [path-to-application]

Options:
  -h|--help          Display help.
  --info             Display .NET Core information.
  --list-sdks        Display the installed SDKs.
  --list-runtimes    Display the installed runtimes.

path-to-application:
  The path to an application .dll file to execute.

C:\Users\AAM>dotnet --version
3.1.200

C:\Users\AAM>
```

Command Prompt

```
Microsoft Windows [Version 10.0.16299.15]  
(c) 2017 Microsoft Corporation. All rights reserved.
```

```
C:\Users\AAM>d:
```

```
D:\>cd DotNetCore
```

```
D:\DotNetCore>cd Apps
```

```
D:\DotNetCore\Apps>
```

Command Prompt

```
D:\DotNetCore\Apps>dotnet new  
Getting ready...  
Usage: new [options]
```

Templates	Short Name	Language

Console Application	console	[C#], F#, VB
le Class library	classlib	[C#], F#, VB
ry WPF Application	wpf	[C#]
WPF Class library	wpflib	[C#]
WPF Custom Control Library	wpfcustomcontrollib	[C#]
WPF User Control Library	wpfusercontrollib	[C#]
Windows Forms (WinForms) Application	winforms	[C#]
rms Windows Forms (WinForms) Class library	winformslib	[C#]
rms Worker Service	worker	[C#]
r/web Unit Test Project	mstest	[C#], F#, VB


```
D:\DotNetCore\Apps>dotnet new console
The template "Console Application" was created successfully.

Processing post-creation actions...
Running 'dotnet restore' on D:\DotNetCore\Apps\Apps.csproj...
  Restore completed in 177.25 ms for D:\DotNetCore\Apps\Apps.csproj.

Restore succeeded.
```

```
D:\DotNetCore\Apps>dir
Volume in drive D is D
Volume Serial Number is 4684-394D
```

```
Directory of D:\DotNetCore\Apps
```

08-07-2020	04:11 PM	<DIR>	.
08-07-2020	04:11 PM	<DIR>	..
08-07-2020	04:11 PM		178 Apps.csproj
08-07-2020	04:11 PM	<DIR>	obj
08-07-2020	04:11 PM		186 Program.cs
	2 File(s)		364 bytes
	3 Dir(s)	325,871,345,664 bytes free	

```
D:\DotNetCore\Apps>
```

```
D:\DotNetCore\Apps>type Apps.csproj
<Project Sdk="Microsoft.NET.Sdk">
  <PropertyGroup>
    <OutputType>Exe</OutputType>
    <TargetFramework>netcoreapp3.1</TargetFramework>
  </PropertyGroup>
</Project>
D:\DotNetCore\Apps>
```

```
D:\DotNetCore\Apps>type Program.cs
```

```
using System;
```

```
namespace Apps
```

```
{  
    class Program
```

```
{  
    static void Main(string[] args)
```

```
{  
        Console.WriteLine("Hello World!");  
    }
```

```
}
```

```
}
```

```
D:\DotNetCore\Apps>
```

```
D:\DotNetCore\Apps>dotnet build
Microsoft (R) Build Engine version 16.5.0+d4cbfca49 for .NET Core
Copyright (C) Microsoft Corporation. All rights reserved.

    Restore completed in 41.58 ms for D:\DotNetCore\Apps\Apps.csproj.
    Apps -> D:\DotNetCore\Apps\bin\Debug\netcoreapp3.1\Apps.dll

Build succeeded.
    0 Warning(s)
    0 Error(s)

Time Elapsed 00:00:06.88

D:\DotNetCore\Apps>dotnet run
Hello World!

D:\DotNetCore\Apps>
```

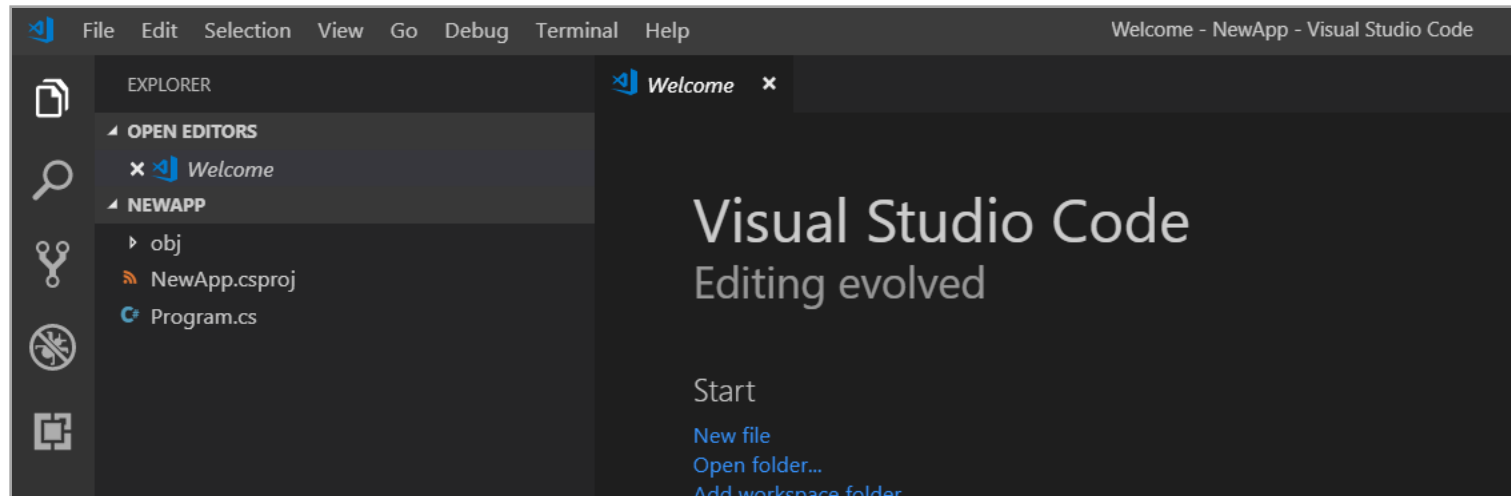
C:\ Command Prompt

```
D:\DotNetCore\NewApp>dotnet new console
The template "Console Application" was created successfully.

Processing post-creation actions...
Running 'dotnet restore' on D:\DotNetCore\NewApp\NewApp.csproj...
  Restore completed in 133.69 ms for D:\DotNetCore\NewApp\NewApp.csproj.

Restore succeeded.

D:\DotNetCore\NewApp>code .
D:\DotNetCore\NewApp>
```



Welcome

C# Program.cs X

C# Program.cs

```
1  using System;
2
3  namespace NewApp
4  {
5      class Program
6      {
7          static void Main(string[] args)
8          {
9              Console.WriteLine("Hello World!");
10         }
11     }
12 }
13
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

Windows PowerShell

Copyright (C) Microsoft Corporation. All rights reserved.

PS D:\DotNetCore\NewApp> dotnet run

Hello World!

PS D:\DotNetCore\NewApp>

```
D:\DotNetCore>dotnet new console --name cApp1
The template "Console Application" was created successfully.
```

```
Processing post-creation actions...
Running 'dotnet restore' on cApp1\cApp1.csproj...
    Determining projects to restore...
    Restored D:\DotNetCore\cApp1\cApp1.csproj (in 140 ms).
```

```
Restore succeeded.
```

```
D:\DotNetCore>code .
```

```
D:\DotNetCore>dotnet new classlib --name cl1
The template "Class library" was created successfully.
```

```
Processing post-creation actions...
Running 'dotnet restore' on cl1\cl1.csproj...
    Determining projects to restore...
    Restored D:\DotNetCore\cl1\cl1.csproj (in 4.81 sec).
```

```
Restore succeeded.
```


```
D:\DotNetCore>cd cApp1
```

```
D:\DotNetCore\cApp1>dotnet add reference ../cl1/cl1.csproj
Reference `..\cl1\cl1.csproj` added to the project.
```

```
D:\DotNetCore\cApp1>
```

EXPLORER



✓ OPEN EDITORS

✕  cApp1.csproj cApp1


✓ DOTNETCORE

✓ cApp1

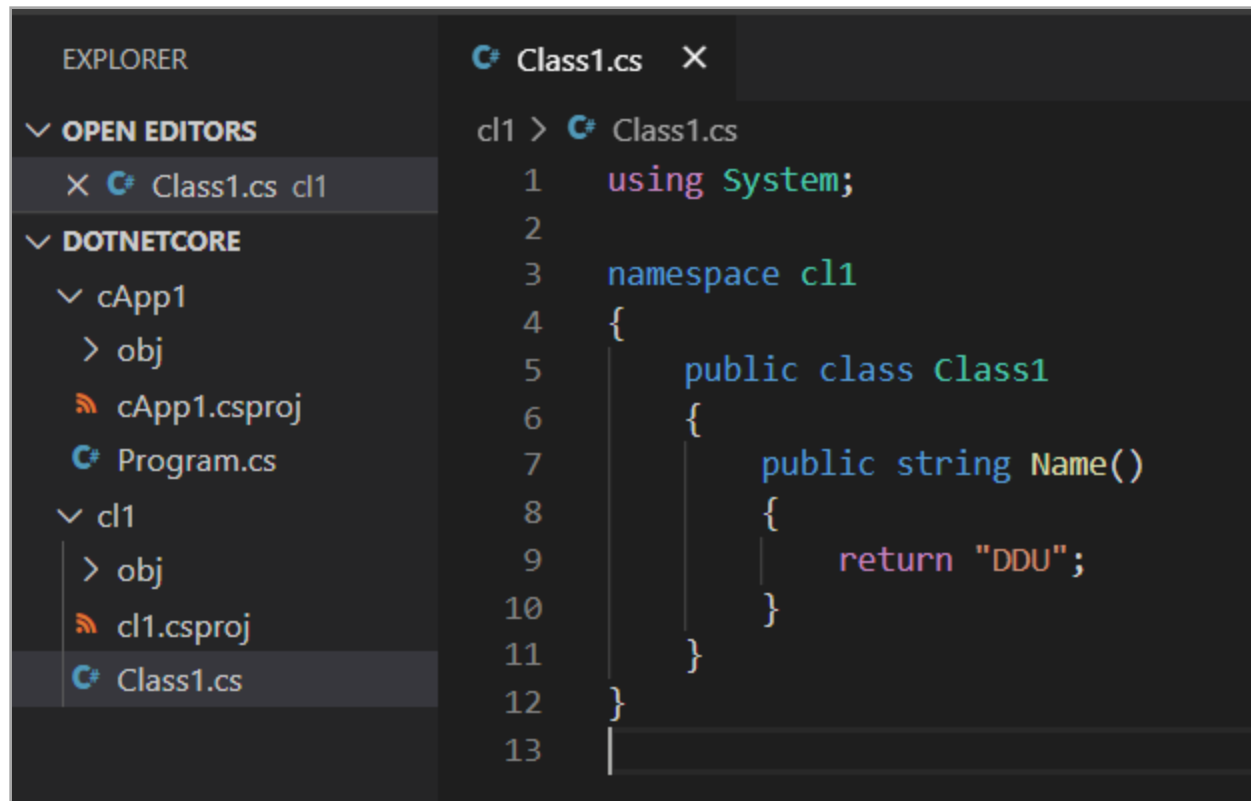
> obj

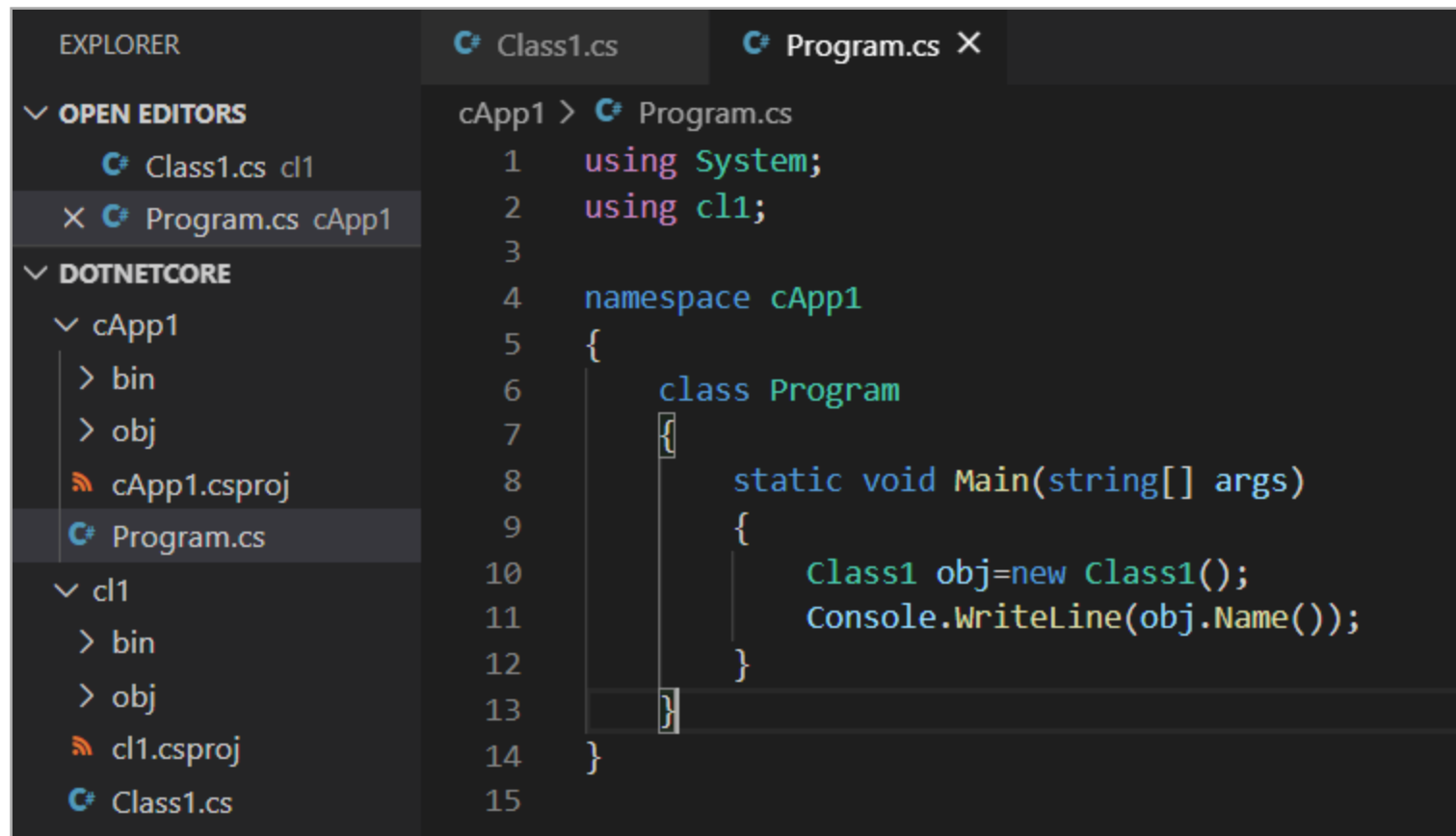
 cApp1.csproj Program.cs

> cl1

 cApp1.csproj ✕cApp1 >  cApp1.csproj

```
1  <Project Sdk="Microsoft.NET.Sdk">
2
3    <ItemGroup>
4      <ProjectReference Include="..\cl1\cl1.csproj" />
5    </ItemGroup>
6
7    <PropertyGroup>
8      <OutputType>Exe</OutputType>
9      <TargetFramework>netcoreapp3.1</TargetFramework>
10    </PropertyGroup>
11
12  </Project>
13
```



EXPLORER

OPEN EDITORS

- Class1.cs cl1
- Program.cs cApp1

DOTNETCORE

- cApp1
 - bin
 - obj
 - cApp1.csproj
 - Program.cs
- cl1
 - bin
 - obj
 - cl1.csproj
 - Class1.cs

Class1.cs Program.cs X

cApp1 > Program.cs

```
1 using System;
2 using cl1;
3
4 namespace cApp1
5 {
6     class Program
7     {
8         static void Main(string[] args)
9         {
10             Class1 obj=new Class1();
11             Console.WriteLine(obj.Name());
12         }
13     }
14 }
15
```

```
D:\DotNetCore\cApp1>dotnet run
DDU
```

```
D:\DotNetCore\cApp1>
```

```
D:\DotNetCore>dotnet new console --name mySampleApp
The template "Console Application" was created successfully.

Processing post-creation actions...
Running 'dotnet restore' on mySampleApp\mySampleApp.csproj...
    Determining projects to restore...
    Restored D:\DotNetCore\mySampleApp\mySampleApp.csproj (in 145 ms).


Restore succeeded.
```

NuGet Gallery | bootstrap 5.0.0-alpha1

← → ↻ 🔒 nuget.org/packages/bootstrap/5.0.0-alpha1

Apps

⚠ NuGet.org had TLS 1.0 and 1.1 disabled. Please refer to our blog post if you are having issues.

 nuget

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[Upload](#)

[Statistics](#)

[Documentation](#)

[Downloads](#)

[Blog](#)



bootstrap

5.0.0-alpha1

The most popular front-end framework for developing responsive, mobile first projects on the web.

ⓘ This is a prerelease version of bootstrap.


Package Manager

.NET CLI

PackageReference

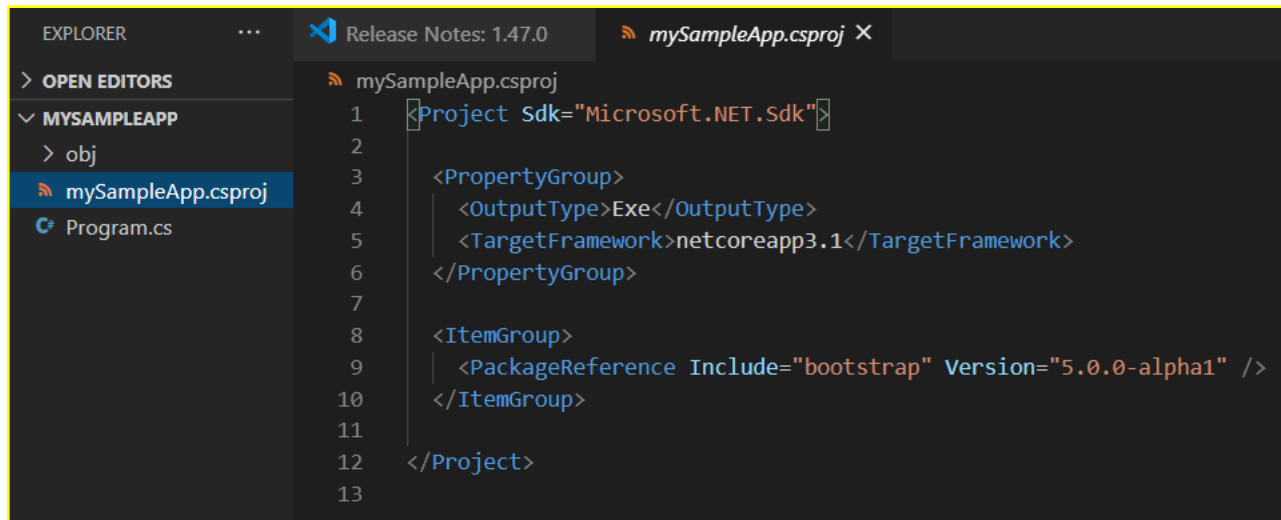
Paket CLI

```
> dotnet add package bootstrap --version 5.0.0-alpha1
```



```
D:\DotNetCore>cd mySampleApp
```

```
D:\DotNetCore\mySampleApp>dotnet add package bootstrap --version 5.0.0-alpha1
```



The screenshot shows the Visual Studio IDE with the Explorer pane on the left and the Solution Explorer on the right. The Explorer pane shows the project structure with 'mySampleApp.csproj' selected. The Solution Explorer shows the 'mySampleApp.csproj' file with the following XML content:

```
1 <Project Sdk="Microsoft.NET.Sdk">
2
3   <PropertyGroup>
4     <OutputType>Exe</OutputType>
5     <TargetFramework>netcoreapp3.1</TargetFramework>
6   </PropertyGroup>
7
8   <ItemGroup>
9     <PackageReference Include="bootstrap" Version="5.0.0-alpha1" />
10  </ItemGroup>
11
12 </Project>
```

.NET Core vs .NET Framework^{server apps}

- There are two supported .NET implementations for building server-side apps
 - .NET Framework
 - .NET Core.
 - Both share many of the same components and you can share code across the two.
 - However, there are fundamental differences between the two and your choice depends on what you want to accomplish.

.NET Core^{When}

- You have cross-platform needs.
- You're targeting microservices.
- You're using Docker containers.
- You need high-performance and scalable systems.
- You need side-by-side .NET versions per application.

.NET Framework^{When}

- Your app currently uses .NET Framework (recommendation is to extend instead of migrating).
- Your app uses third-party .NET libraries or NuGet packages not available for .NET Core.
- Your app uses .NET technologies that aren't available for .NET Core.
- Your app uses a platform that doesn't support .NET Core.
 - Windows, macOS, and Linux support .NET Core.

What is the difference between SDK
and Runtime in .NET Core?

What is CoreCLR?

