Using Partially Applied Functions in Modeling

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```
17
18      public Part Part { get; set; } = null!;
19      public FileContent BarcodeImage { get; set; } = null!;
20
21      public void OnGet(Guid id)
22      {
23          this.Part = this.Parts.Find(id);
24          this.BarcodeImage = this.Part.Sku.ToCode39(this.Margins, this.Style);
25      }
26
27      private BarcodeGeneration.Margins Margins => new(
28          Horizontal: 20, Vertical: 10, BarHeight: 200);
29
30      private BarcodeGeneration.Style Style => new(
31          ThinBarWidth: 4, ThickBarWidth: 10, GapWidth: 6, Padding: 6, Antialias: false);
32  }
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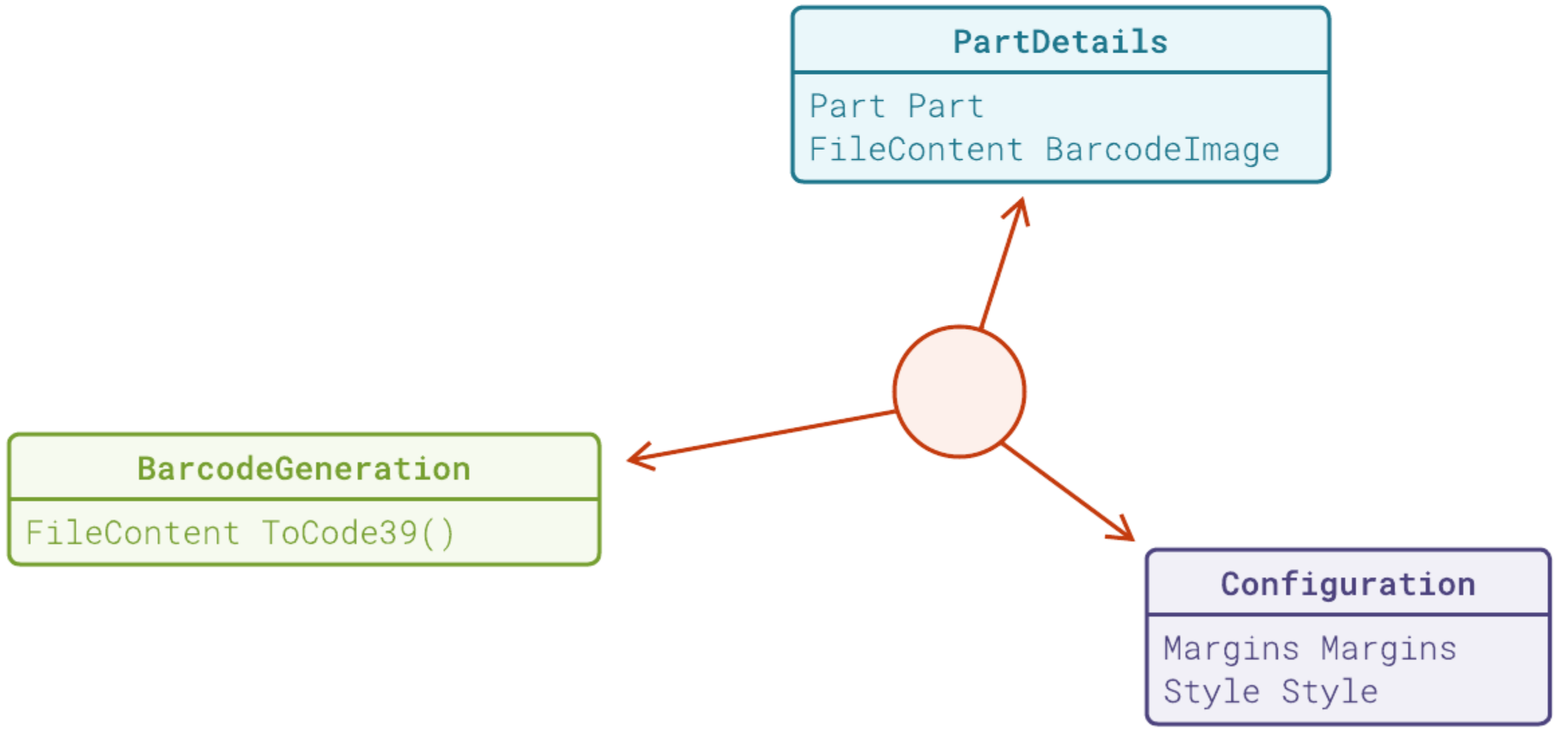
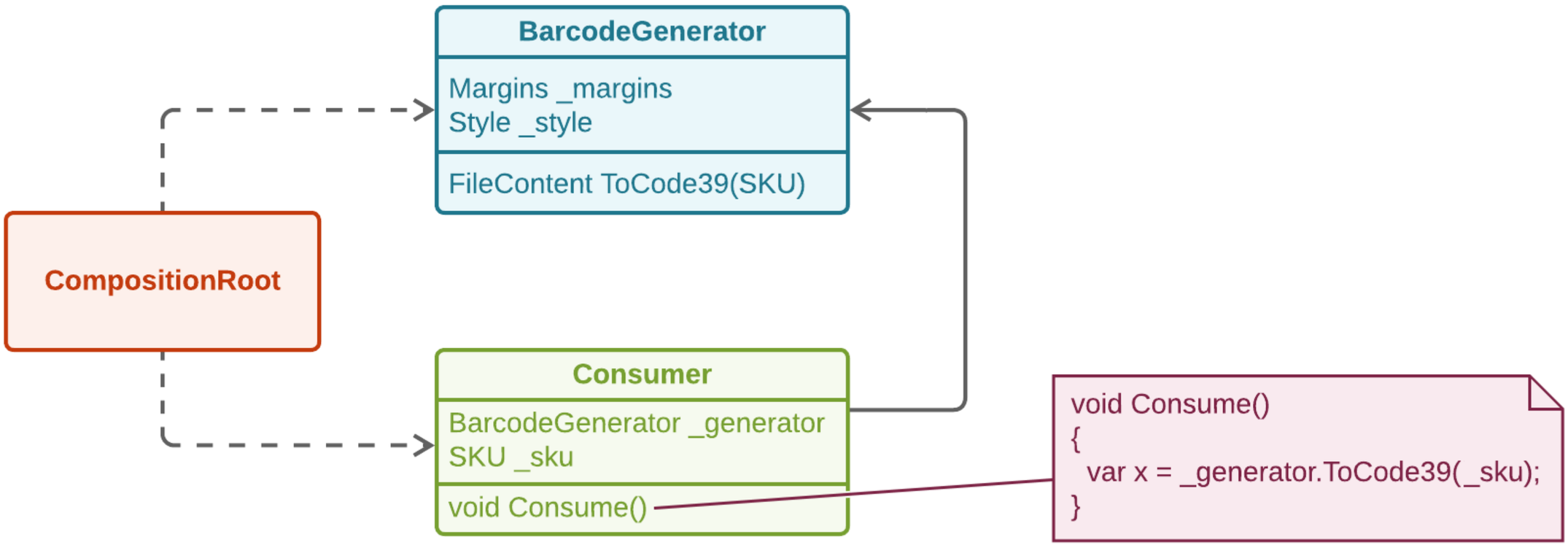


Object-oriented Composition



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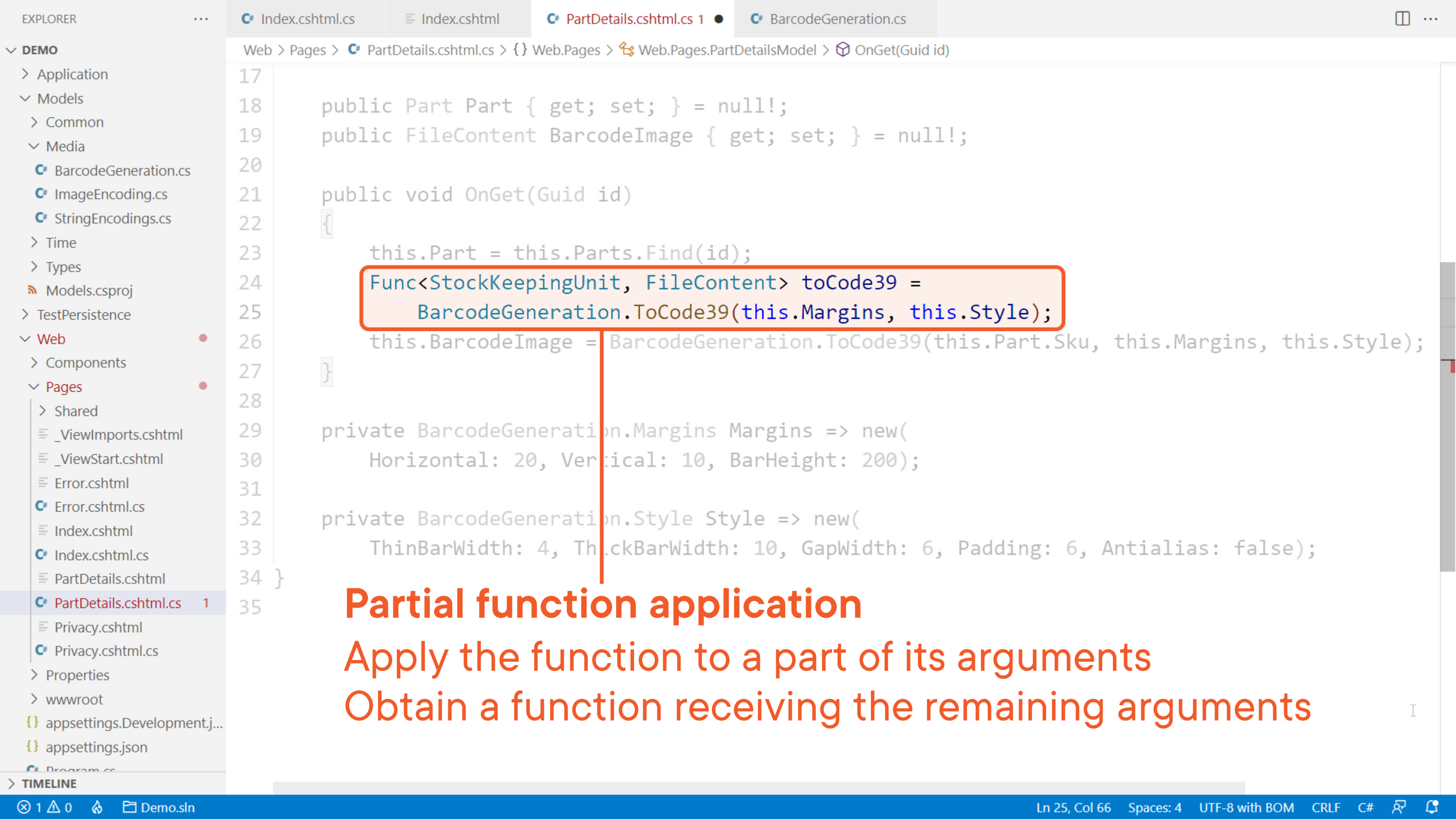
EXPLORER
Index.cshtml.cs
Index.cshtml
PartDetails.cshtml.cs 1
BarcodeGeneration.cs
Web > Pages > PartDetails.cshtml.cs > { } Web.Pages > Web.Pages.PartDetailsModel > OnGet(Guid id)
DEMO
Application
Models
Common
Media
BarcodeGeneration.cs
ImageEncoding.cs
StringEncodings.cs
Time
Types
Models.csproj
TestPersistence
Web
Components
Pages
Shared
_ViewImports.cshtml
_ViewStart.cshtml
Error.cshtml
Error.cshtml.cs
Index.cshtml
Index.cshtml.cs
PartDetails.cshtml
PartDetails.cshtml.cs 1
Privacy.cshtml
Privacy.cshtml.cs
Properties
wwwroot
appsettings.Development.j...
appsettings.json
TIMELINE
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Partial function application
Apply the function to a part of its arguments
Obtain a function receiving the remaining arguments
1 0
Demo.sln
Ln 25, Col 66
Spaces: 4
UTF-8 with BOM
CRLF
C#

```
class SomeClass
{
  public SomeClass(
    Func<int, int> dependency) =>
    Dependency = dependency;

  private Func<int, int> Dependency
    { get; }
}
```

- **Inject a** Func/Action **delegate like a dependency**

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class SomeClass
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- **Delegate is an object, like any other**

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  private void Demo()
  {
    var y = this.Dependency.Invoke(5);
  }
}
```

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private Func<int, int, int> f;

private Func<FileContent,
             StockKeepingUnit> g;
```

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- **Delegate is an object, like any other**
  - It may include captured variables (the closure)
- **Call the delegate's** Invoke **method to execute it**
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- **Arguments have no names**
- **Argument types can help avoid mistakes**

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  Still possible to inject *any* function with this signature

Summary

Partial function application

- Supply a sublist of function's arguments
- Obtain a function receiving the rest

Partial function application in C#

- Transform a static method into
  a delegate with shorter argument list

Using strongly-typed delegates

- Allow extension methods on themselves
- We can transform functions
  into new functions

Summary

Practical use of partial application

- Separated configuration arguments from the function's primary target
- Injected partially-applied function as a dependency

Important takeaway

- Partial function application simplifies code

Up Next:

Substituting Inheritance with Discriminated Unions