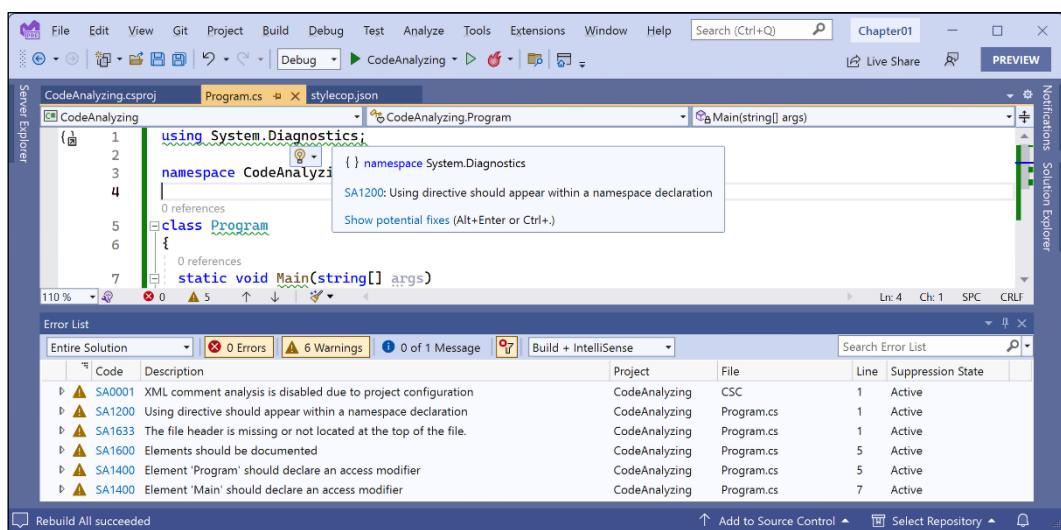
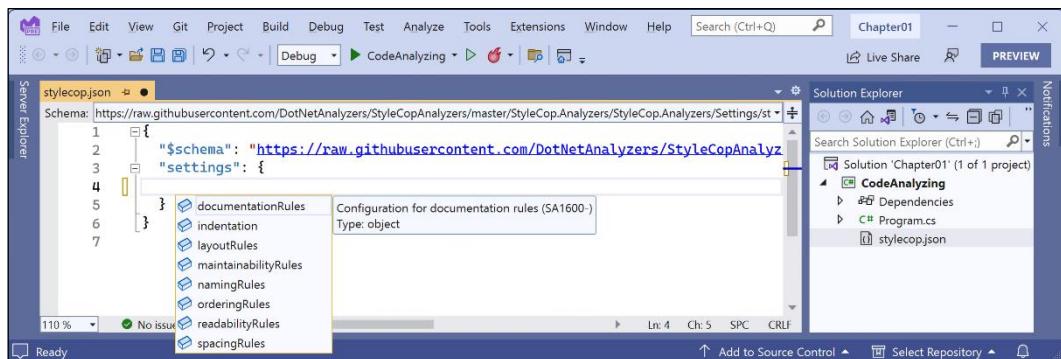
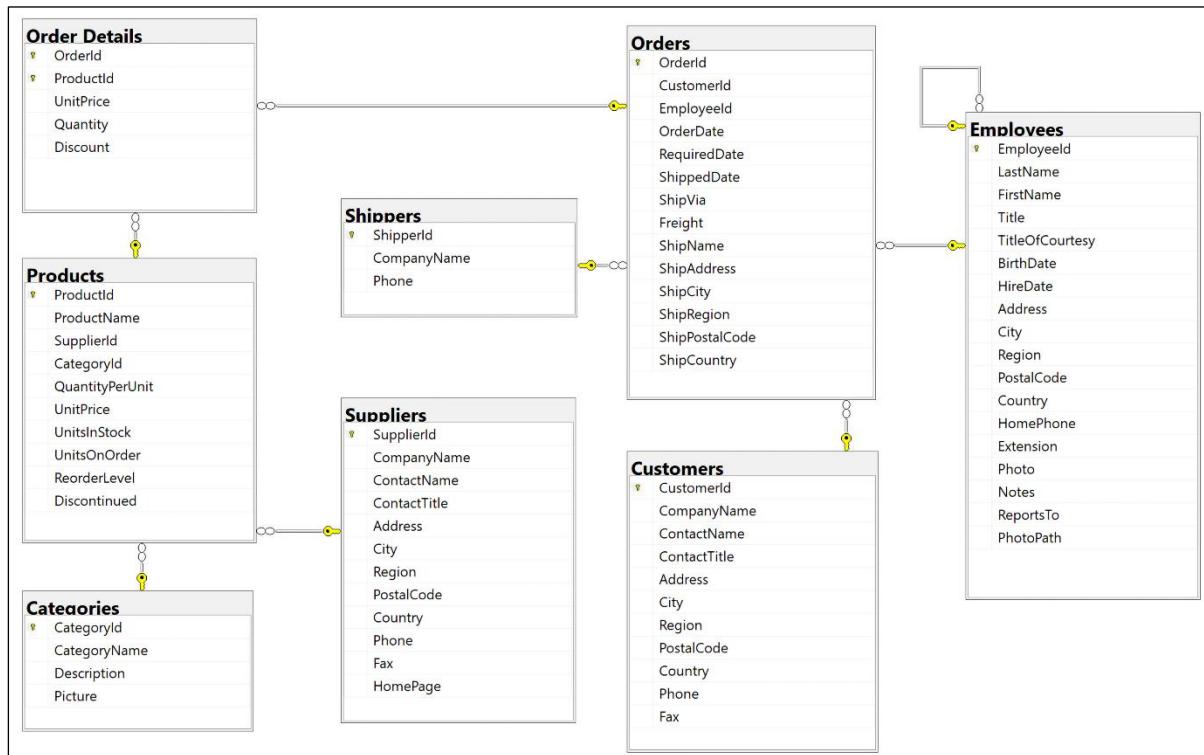


# Chapter 1: Introducing Apps and Services with .NET



# Chapter 2: Managing Relational Data Using SQL Server



Screenshot of Visual Studio Code showing a query execution:

Query in the Editor:

```
SELECT TOP (1000) [CustomerId] Untitled-1
1  SELECT TOP (1000) [CustomerId]
2  ,[CompanyName]
3  ,[ContactName]
4  ,[ContactTitle]
5  ,[Address]
6  ,[City]
7  ,[Region]
8  ,[PostalCode]
9  ,[Country]
10 ,[Phone]
11 ,[Fax]
12  FROM [dbo].[Customers]
```

Results in the Terminal:

CustomerID	CompanyName	ContactName	ContactTitle
ALFKI	Alfreds Futterkiste	MARCUS	SALESREP
ANATR	Ana Trujillo Emparedados y helados	ANATR	SALESREP
ANTON	Antonio Moreno Taquería	ANTON	SALESREP
AROUT	Around the Horn	ANTONY	SALESREP
BERGS	Berglunds snabbköp	ERIKSSON	SALESREP
BLAUS	Blauer See Delikatessen	BLAUS	SALESREP
BLONP	Blondes dds l père et fils	BLONP	SALESREP
BOLID	Bólido Comidas preparadas	BOLID	SALESREP

Messages in the Terminal:

```
[17:24:50] Started executing query at Line 1
(91 rows affected)
```

The screenshot shows the Microsoft SQL Server Management Studio (SSMS) interface. In the center, there is a query window titled "SQLQuery1.sql - (local).Northwind (DESKTOP-J1PQHR7\markj (61)) - Microsoft SQL Server Management Studio". The query window contains the following T-SQL code:

```


***** Script for SelectTopNRows command from SSMS *****
SELECT TOP (1000) [ProductId]
    ,[ProductName]
    ,[SupplierId]
    ,[CategoryId]
    ,[QuantityPerUnit]
    ,[UnitPrice]
    ,[UnitsInStock]
    ,[UnitsOnOrder]
    ,[ReorderLevel]
    ,[Discontinued]
FROM [Northwind].[dbo].[Products]


```

Below the code, the results pane displays a table with four rows of data from the Northwind database's Products table. The columns are: ProductId, ProductName, SupplierId, CategoryId, QuantityPerUnit, UnitPrice, UnitsInStock, UnitsOnOrder, ReorderLevel, and Discontinued.

ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued
1	Chai	1	1	10 boxes x 20 bags	18.00	39	0	10	0
2	Chang	1	1	24 - 12 oz bottles	19.00	17	40	25	0
3	Aniseed Syrup	1	2	12 - 550 ml bottles	10.00	13	70	25	0
4	Chef Anton's...	2	2	48 - 6 oz jars	22.00	53	0	0	0

A status bar at the bottom indicates: "Query executed successfully." and "100%".

## Create SQL Database Server

Microsoft

**Server details**

Enter required settings for this server, including providing a name and location. This server will be created in the same subscription and resource group as your database.

**Server name \***  .database.windows.net

**Location \***

**Authentication**

Select your preferred authentication methods for accessing this server. Create a server admin login and password to access your server with SQL authentication, select only Azure AD authentication [Learn more](#) using an existing Azure AD user, group, or application as Azure AD admin [Learn more](#), or select both SQL and Azure AD authentication.

**Authentication method**

Use only Azure Active Directory (Azure AD) authentication  
 Use both SQL and Azure AD authentication  
 Use SQL authentication

**Server admin login \***

**Password \***  ✓

**Confirm password \***  ✓

**OK**

**Microsoft.SQLDatabase.newDatabaseNewServer\_5462f5474d034e4ebf9de | Overview**

Deployment

Search | Delete | Cancel | Redeploy | Download | Refresh

We'd love your feedback! →

### Deployment is in progress

Deployment name: Microsoft.SQLDat... Start time: 9/23/2022, 4:...  
Subscription: Pay-As-You-Go Correlation ID: f2287bc8-1  
Resource group: apps-services-net7

Deployment details

Resource	Type	Status
apps-services-net7/Client	Microsoft.Sql/servers/f...	Created
apps-services-net7/No...	Microsoft.Sql/servers/...	Accepted
apps-services-net7/Defa...	Microsoft.Sql/servers/...	OK
apps-services-net7	Microsoft.Sql/servers	OK
apps-services-net7	Microsoft.Sql/servers	Created

Microsoft Defender for Cloud  
Secure your apps and infrastructure  
[Go to Microsoft Defender for Cloud >](#)

Free Microsoft tutorials  
[Start learning today >](#)

Work with an expert  
Azure experts are service provider partners  
who can help manage your assets on Azure  
and be your first line of support.  
[Find an Azure expert >](#)

Home > Microsoft.SQLDatabase.newDatabaseNewServer\_5462f5474d034e4ebf9de | Overview >

**Northwind (apps-services-net7/Northwind)**

SQL database

Search | Copy | Restore | Export | Set server firewall | Delete | Connect with... | Feedback

This database was just created. Do you need any help [getting started?](#)

Overview

Activity log

Tags

Diagnose and solve problems

Getting started

Query editor (preview)

Power Platform

Power BI

Power Apps

Power Automate

Essentials

Resource group ([move](#))  
[apps-services-net7](#)

Status  
Ready

Location  
UK South

Subscription ([move](#))  
[Pay-As-You-Go](#)

Subscription ID  
dd2951b0-6892-42e8-a753-1daa6e8f9dc0

Tags ([edit](#))

Server name  
[apps-services-net7.database.windows.net](#)

Elastic pool  
[No elastic pool](#)

Connection strings  
[Show database connection strings](#)

Pricing tier  
[Basic](#)

Earliest restore point  
No restore point available

File Edit View Git Project Build

Server Explorer

- Data Connections
  - apps-services-net7.Northwind.dbo
    - Tables
    - Views
    - Stored Procedures
    - Functions
    - Synonyms
  - desktop-j1pqr7.Northwind.dbo
- Servers

Modify Connection

Enter information to connect to the selected data source or click "Change" to choose a different data source and/or provider.

Data source:  
[Microsoft SQL Server \(SqlClient\)](#)

Server name:  
tcp:apps-services-net7.database.windows.net,1433

Log on to the server

Authentication: SQL Server Authentication

User name: markjprice

Password:

Save my password

Connect to a database

Select or enter a database name:  
Northwind

Chapter07

Live Share

PREVIEW

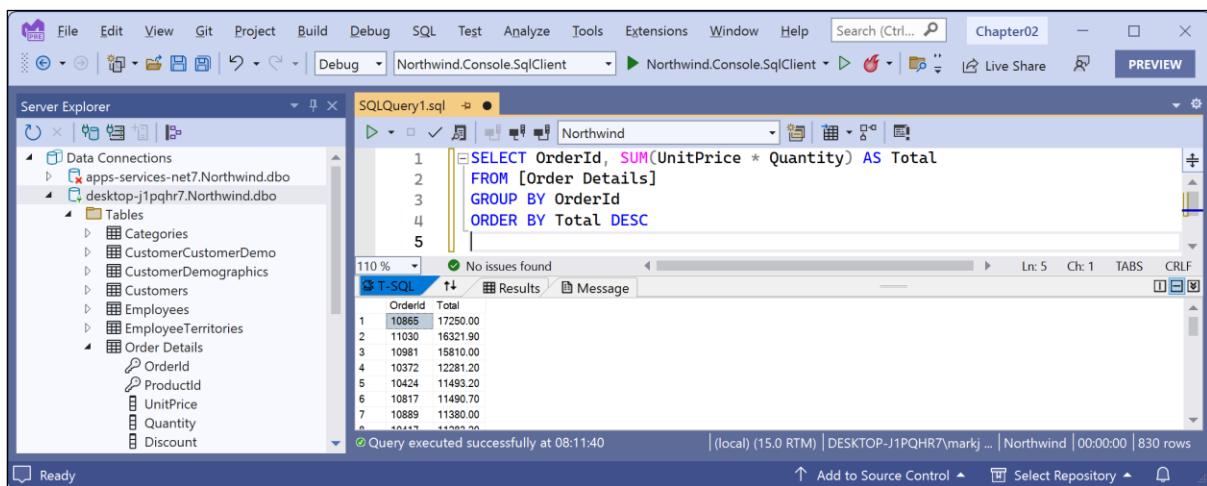
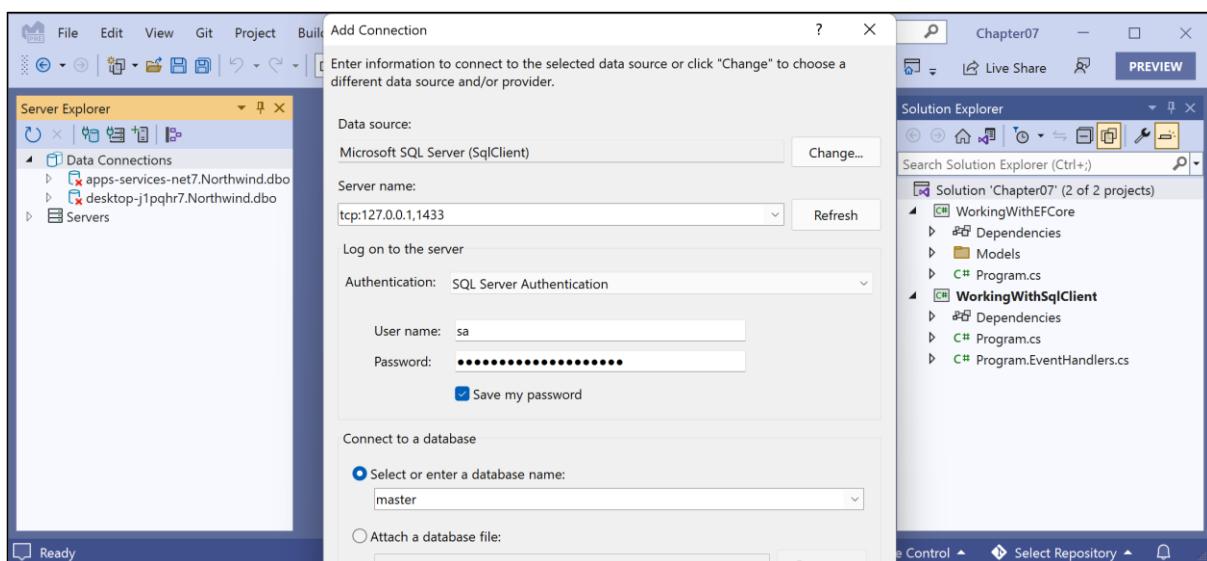
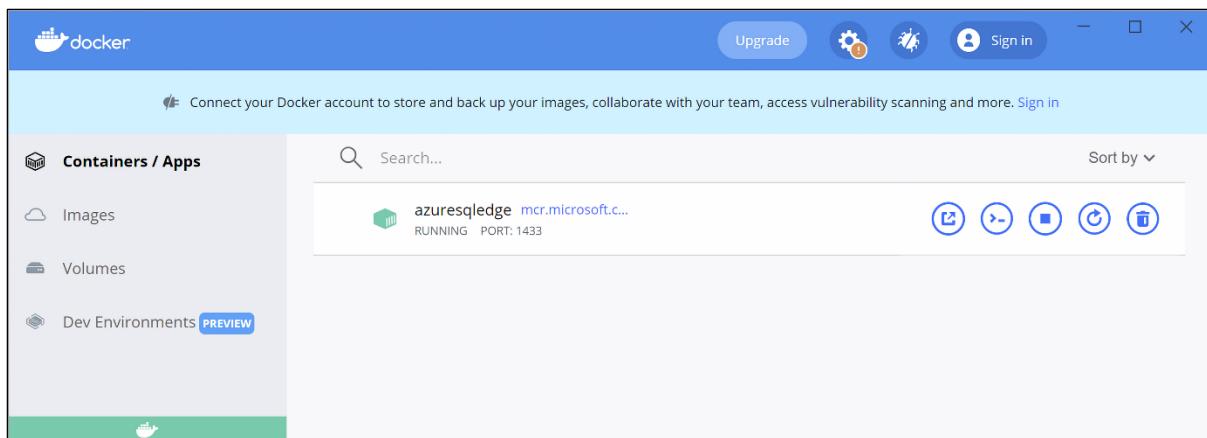
Explorer (Ctrl+)

Chapter07' (1 of 1 project)

gWithSqlClient

Dependencies

Program.cs



The screenshot shows a Visual Studio Code interface with a SQL Server connection named "LocalSqlServer". A query is being run:

```

SELECT OrderId, SUM(UnitPrice * Quantity) AS Total
FROM [Order Details]
GROUP BY OrderId
ORDER BY Total DESC

```

The results are displayed in a table:

OrderId	Total
10865	17250.00
11030	16321.90
10981	15810.00
10372	12281.20
10424	11493.20
10817	11490.70
10889	11380.00
10417	11283.20

Messages at the bottom indicate the query was started at 08:17:35, 830 rows affected, and total execution time 00:00:00.065.

The screenshot shows the "WorkingWithSqlClient" project in Visual Studio. In the Server Explorer, a stored procedure named "GetExpensiveProducts" is selected. Its T-SQL code is displayed in the center pane:

```

CREATE PROCEDURE [dbo].[GetExpensiveProducts]
    @price money,
    @count int OUT
AS
    SELECT @count = COUNT(*)
    FROM Products
    WHERE UnitPrice > @price

    SELECT *
    FROM Products
    WHERE UnitPrice > @price

    RETURN 0

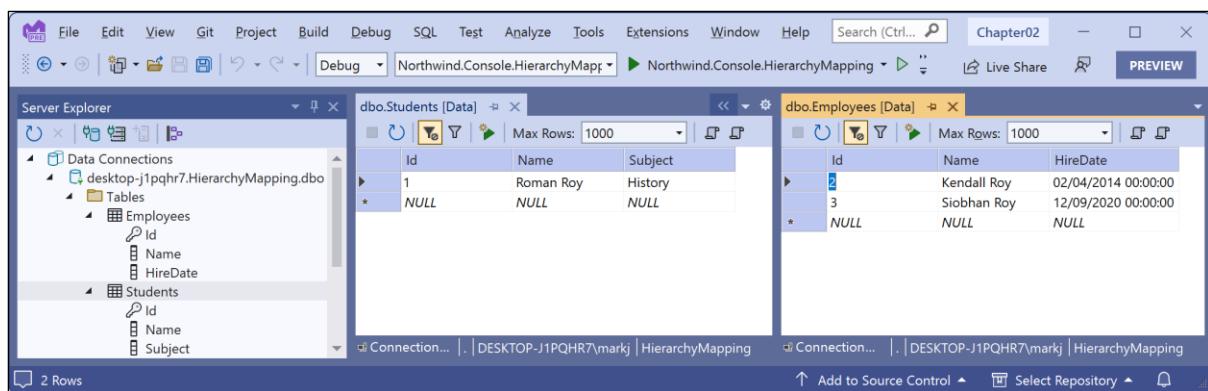
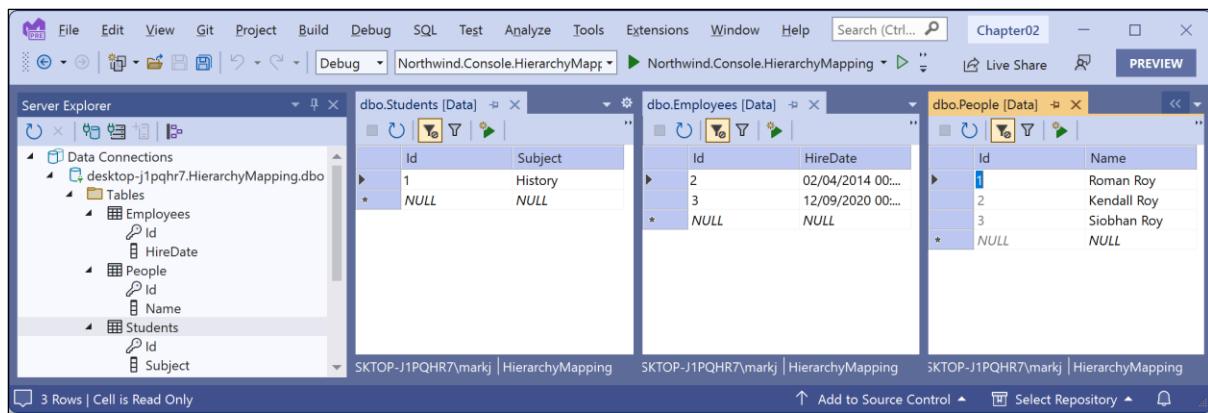
```

The Solution Explorer on the right shows the project structure with files like "Program.cs" and "Program.EventHandler.cs".

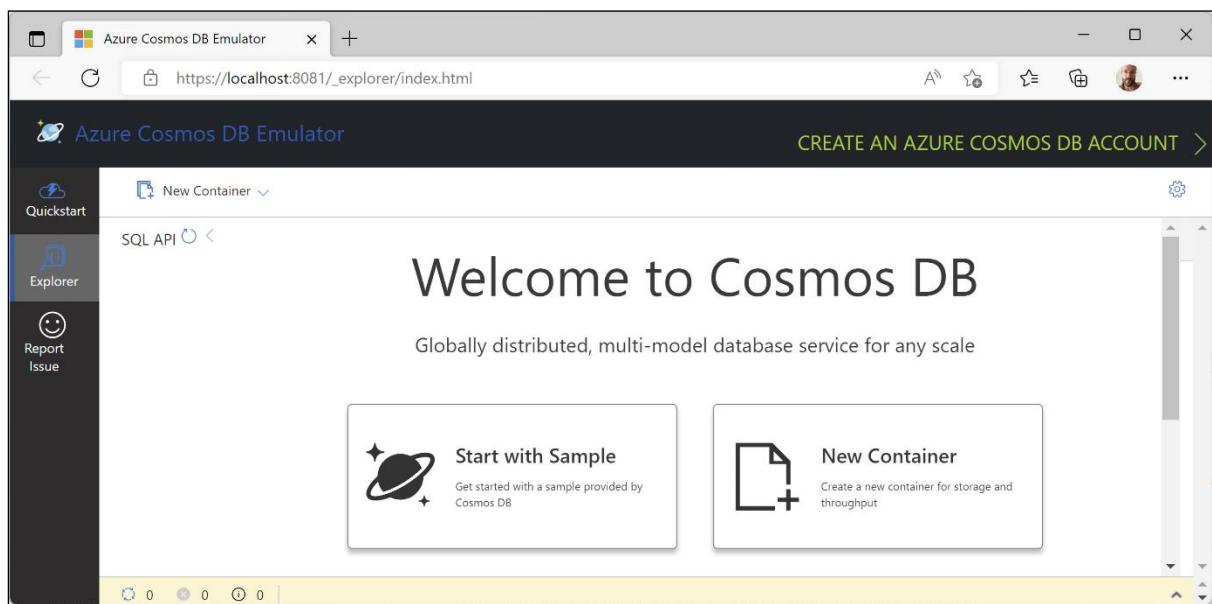
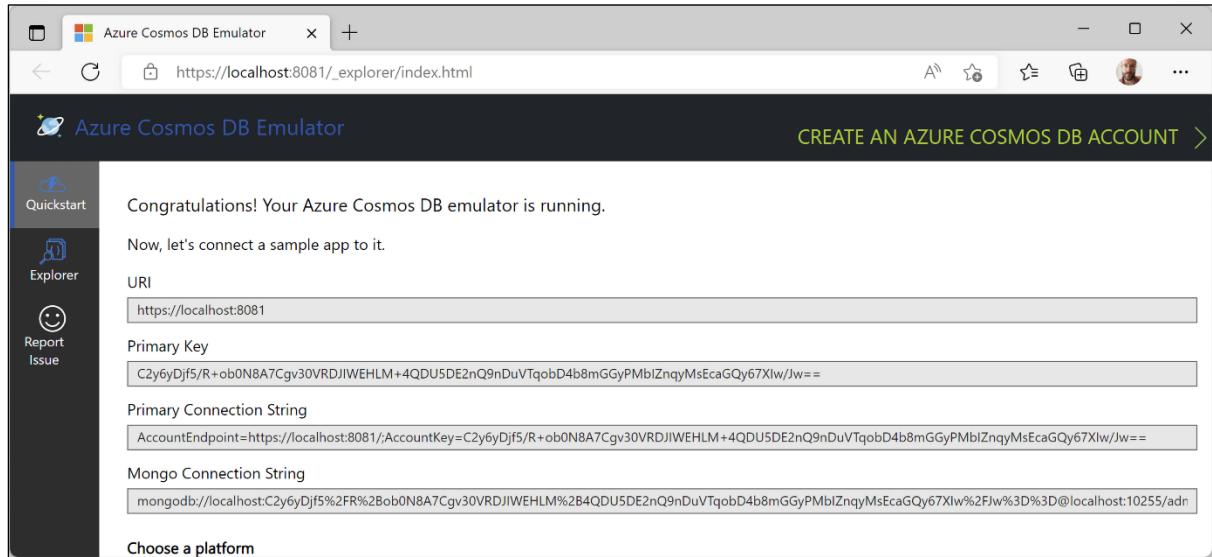
The screenshot shows the "Northwind.Console.HierarchyMapping" project in Visual Studio. In the Server Explorer, a table named "People" is selected. The data grid shows the following rows:

ID	Name	Discriminator	HireDate	Subject
1	Roman Roy	Student	NULL	History
2	Kendall Roy	Employee	02/04/2014 00:00:00	NULL
3	Siobhan Roy	Employee	12/09/2020 00:00:00	NULL
NULL	NULL	NULL	NULL	NULL

The status bar at the bottom indicates "Connection Ready".



# Chapter 3: Managing NoSQL Data Using Azure Cosmos DB



SQL API

Northwind

Products

Items

id /productId

Load more

Settings

Stored Procedures

User Defined Functions

Triggers

Create new or work with existing document(s).

SQL API

Northwind

Products

Items

id /productId

7e0f6c72-899a-4377-9... 1

4a453d5a-ec1a-444b-b... 2

3ae8f3d8-11b8-4421-b... 3

Settings

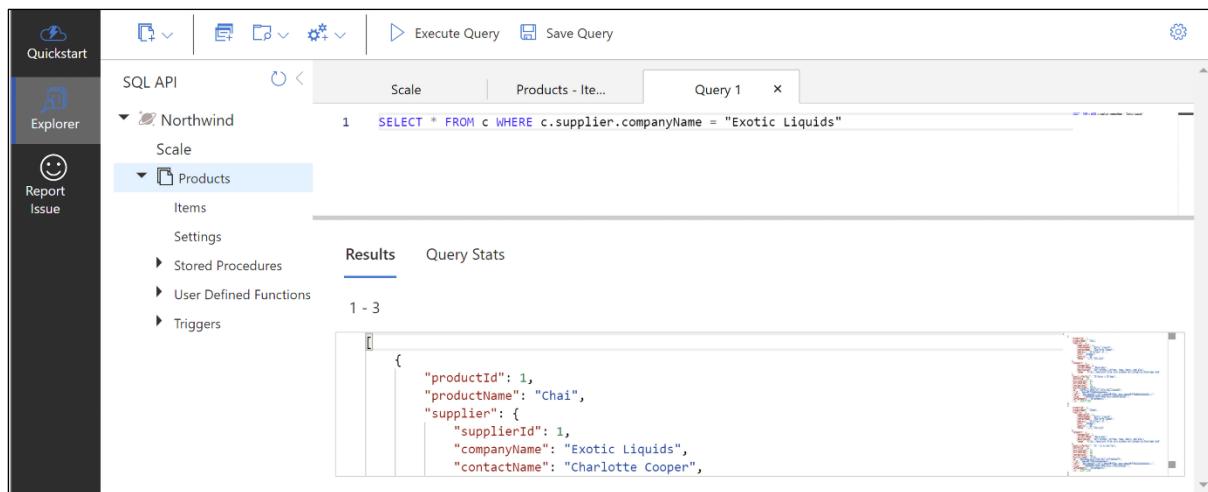
Stored Procedures

User Defined Functions

Triggers

Load more

```
1 "productId": 1,
2   "productName": "Chai",
3   "supplier": {
4     "supplierId": 1,
5     " companyName": "Exotic Liquids",
6     "contactName": "Charlotte Cooper",
7     "address": "49 Gilbert St.",
8     "city": "London",
9     "country": "UK",
10    "phone": "(171) 555-2222"
11  },
12  "category": {
13    "categoryId": 1,
14    "categoryName": "Beverages",
15    "description": "Soft drinks, coffees, teas, !",
16    "image": "https://myaccount.blob.core.windows.net"
17  },
18  "quantityPerUnit": "10 boxes x 20 bags",
19  "unitPrice": 18,
20  "unitsInStock": 39,
21  "unitsOnOrder": 0,
22  "reorderLevel": 10,
23  "discontinued": false,
24  "id": "7e0f6c72-899a-4377-95fe-0e5713cee6d3",
25  "_rid": "bmAUAMrF98wBAAAAAAA==",
26  "_self": "dbs/bmAUAMrF98wBAA==/colls/bmAUAMrF98wBAA=/docs/bmAUAMrF98wBAA==/_rid",
27  "_etag": "\"00000000-0000-0000-8e1e-206e007a01d8\"",
28  "_attachments": "attachments/",
29  "_ts": 1656771305
30 }
31 ]
```



A screenshot of the Microsoft Azure portal. The top navigation bar shows 'Microsoft Azure', a search bar, and a user profile. The URL indicates the user is on the 'Create a resource' page. The main content is titled 'Select API option' with a sub-section 'Which API best suits your workload?'. It lists five options: 'Core (SQL) - Recommended', 'Azure Cosmos DB API for MongoDB', 'Cassandra', 'Azure Table', and 'Gremlin (Graph)'. Each option has a 'Create' button and a 'Learn more' link. The 'Core (SQL) - Recommended' section describes it as a fully managed NoSQL database service for building scalable, high performance applications.

**Core (SQL) - Recommended**  
Azure Cosmos DB's core, or native API for working with documents. Supports fast, flexible development with familiar SQL query language and client libraries for .NET, JavaScript, Python, and Java.

**Azure Cosmos DB API for MongoDB**  
Fully managed database service for apps written for MongoDB. Recommended if you have existing MongoDB workloads that you plan to migrate to Azure Cosmos DB.

**Cassandra**  
Fully managed Cassandra database service for apps written for Apache Cassandra. Recommended if you have existing Cassandra workloads that you plan to migrate to Azure Cosmos DB.

**Azure Table**  
Fully managed database service for apps written for Azure

**Gremlin (Graph)**  
Fully managed graph database service using the Gremlin

Home > Create a resource > Select API option >

## Create Azure Cosmos DB Account - Core (SQL)

Validation Success

Basics Global Distribution Networking Backup Policy Encryption Tags **Review + create**

**Creation Time**

Estimated Account Creation Time (in minutes) 2

**i** The estimated creation time is calculated based on the location you have selected

**Basics**

Subscription	Pay-As-You-Go
Resource Group	apps-services-net7
Location	UK West
Account Name	(new) apps-services-net7
API	Core (SQL)
Capacity mode	Provisioned throughput

**Create** **Previous** **Next** Download a template for automation

### apps-services-net7

Azure Cosmos DB account

Search (Ctrl+ /) Add Container Refresh Move Data Explorer Enable geo-redundancy Delete Account

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Cost Management Quick start Notifications Data Explorer Settings Features

Essentials

Status	Read Locations
Online	UK West
Resource group (move)	Write Locations
apps-services-net7	UK West
Subscription (move)	URI
Pay-As-You-Go	https://apps-services-net7.documents.azure.com:443/
Subscription ID	Free Tier Discount
dd2951b0-6892-42e8-a753-1daa6e8f9dc0	Opted Out
Total throughput limit	Capacity mode
4000 RU/s	Provisioned throughput

See more

Containers

Looks like you don't have any containers yet. **Data Explorer**

**apps-services-net7 | Keys** ...  
Azure Cosmos DB account

Search (Ctrl+ /) <

**Settings**

- Features
- Replicate data globally
- Default consistency
- Backup & Restore
- Networking
- CORS
- Dedicated Gateway
- Keys**
- Advisor Recommendations

**Read-write Keys** **Read-only Keys**

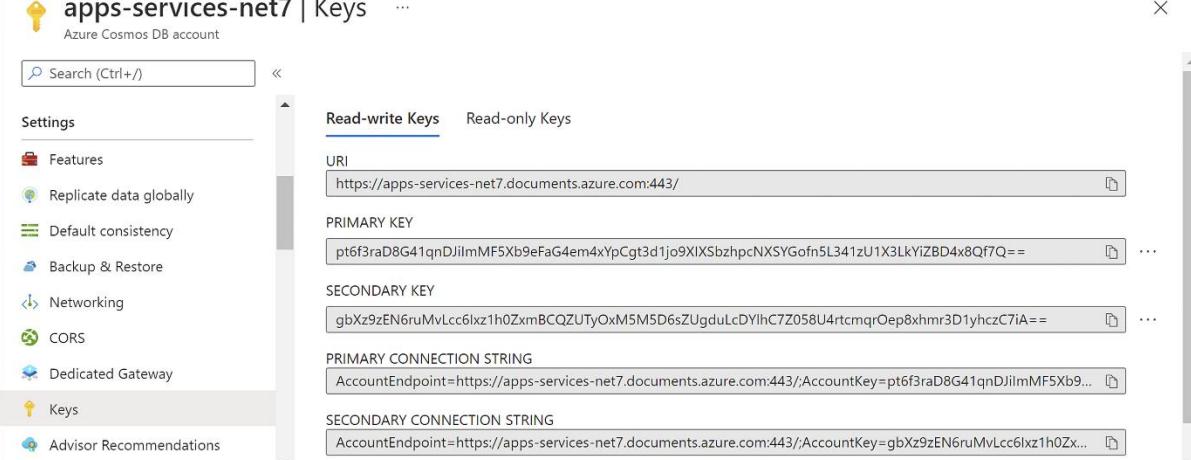
**URI**  
https://apps-services-net7.documents.azure.com:443/

**PRIMARY KEY**  
pt6f3raD8G41qnDjilmMF5Xb9eFaG4em4xYpCgt3d1jo9XIXSbzhpNXSYGofn5L341zU1X3LkYZBD4x8Qf7Q=

**SECONDARY KEY**  
gbXz9zEN6ruMvLcc6lxz1h0ZxmBCQZUTyOxM5M5D6sZUgduLcDYlhC7Z058U4rtcmqrOep8xhmr3D1yhczC7iA==

**PRIMARY CONNECTION STRING**  
AccountEndpoint=https://apps-services-net7.documents.azure.com:443/;AccountKey=pt6f3raD8G41qnDjilmMF5Xb9...

**SECONDARY CONNECTION STRING**  
AccountEndpoint=https://apps-services-net7.documents.azure.com:443/;AccountKey=gbXz9zEN6ruMvLcc6lxz1h0Zx...



**Quickstart**

**Explorer**

**Report**

**Issue**

**SQL API**

Northwind

Scale

Products

Items

Settings

Stored Procedures

User Defined Functions

Triggers

Execute Query Save Query

Products - It...

Query 1

```
1 SELECT p.id, p.productName, p.unitPrice FROM Items p
2 WHERE p.category.categoryName = 'Beverages'
```

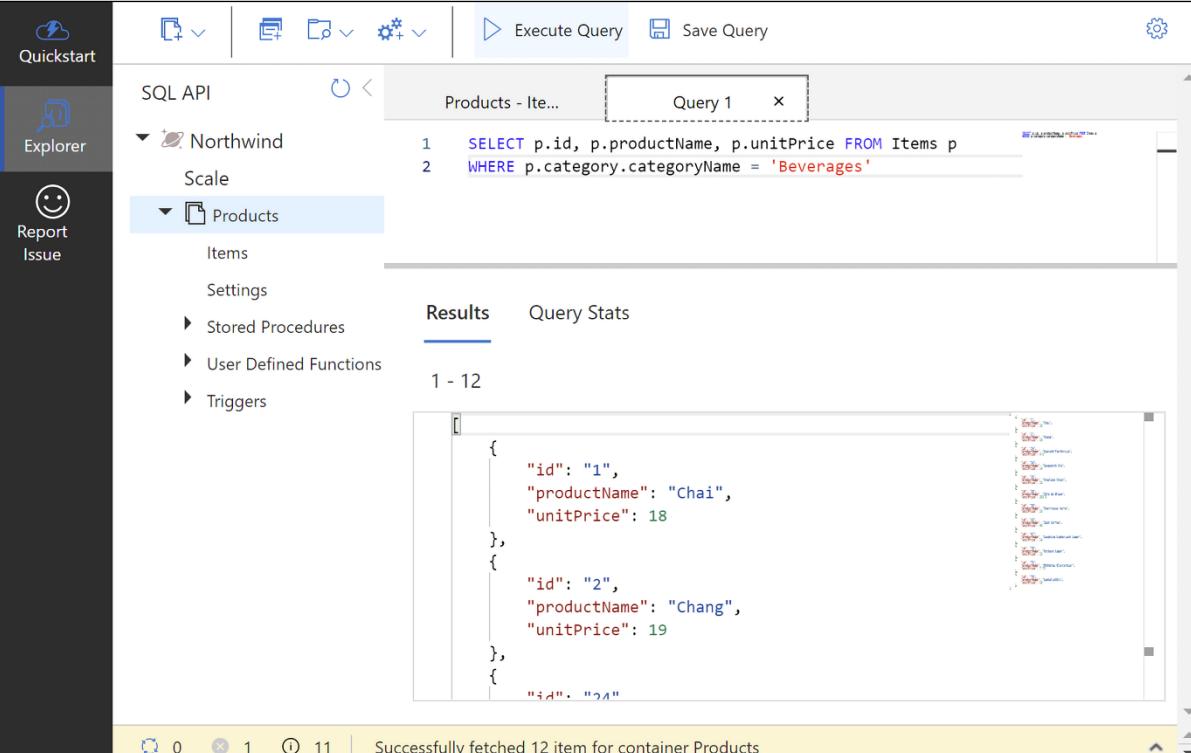
Results

Query Stats

1 - 12

```
{
  "id": "1",
  "productName": "Chai",
  "unitPrice": 18
},
{
  "id": "2",
  "productName": "Chang",
  "unitPrice": 19
},
{
  "id": "24"
}
```

0 1 11 | Successfully fetched 12 item for container Products



The screenshot shows the Azure portal's SQL API interface. On the left, there's a dark sidebar with icons for Explorer, Report Issue, and Quickstart. The main area has a title bar with "SQL API" and "Products - It...". Below the title bar, the database "Northwind" and collection "Products" are selected. A query editor window contains the following T-SQL code:

```
1  SELECT p.id, p.productName, p.unitPrice FROM Items p
2  WHERE p.category.categoryName = 'Beverages'
```

Below the query editor, there are two tabs: "Results" and "Query Stats". The "Query Stats" tab is active, displaying performance metrics:

Metric	Value
Request Charge	3.19 RUs
Showing Results	1 - 12
Retrieved document count	12
Retrieved document size	9787 bytes
Output document count	12
Output document size	752 bytes

A vertical bar chart on the right side visualizes the request charge distribution.

This screenshot is similar to the one above, showing the Azure portal's SQL API interface. The "Products" collection is selected. A query editor window contains the following T-SQL code:

```
1  SELECT AVG(p.unitPrice) AS A
```

A context menu is open over the results table, with options visible: "New Container", "New SQL Query", "Open Query", "New Stored Procedure", "New Stored Procedure" (selected), "New UDF", and "New Trigger".

## Chapter 4: Benchmarking Performance, Multitasking, and Concurrency

 **Carl T. Bergstrom** @CT\_Bergstrom · Dec 17

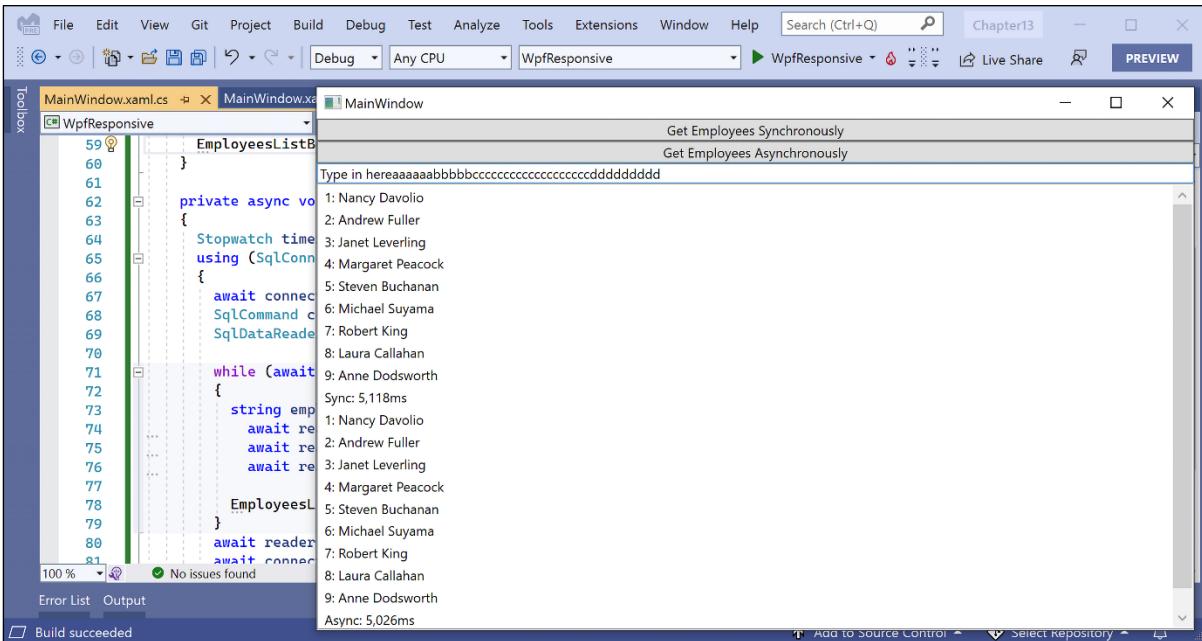
My son clearly has a better grasp on the real world than his teacher does.

8. If 6 workers can make a car in 90 hours, how long would it take 12 workers to make the same car?

(A) 12 hours  
(B) 25 hours  
(C) 30 hours  
(D) 45 hours  
(E) 180 hours

A large red X is drawn over the question and the options. The correct answer, (E) 180 hours, is circled in black.

◀ 253   ▶ 10K   ❤ 16K   ...

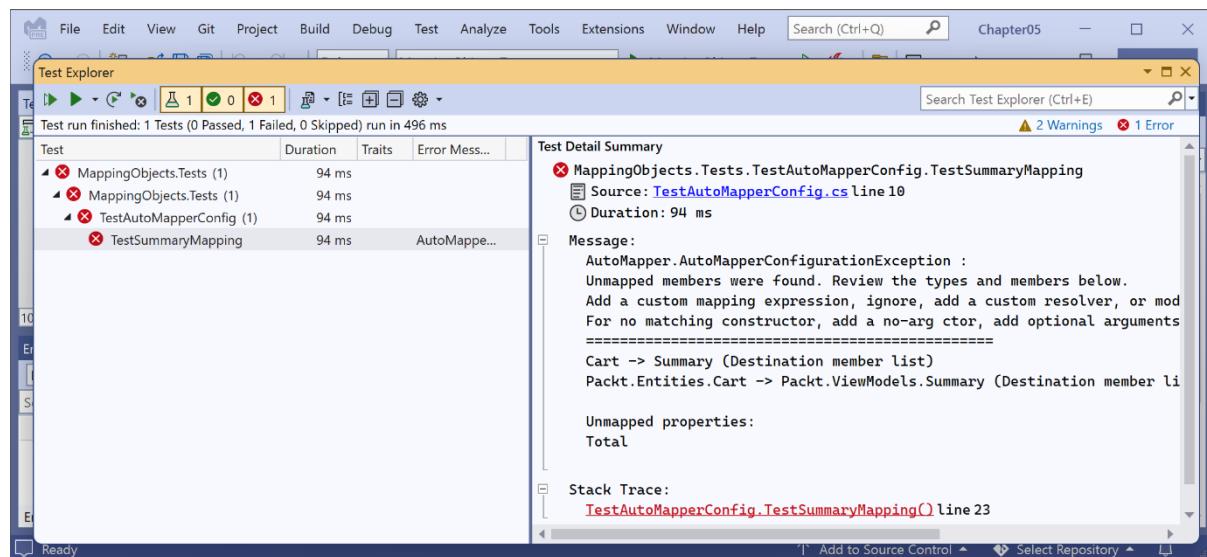
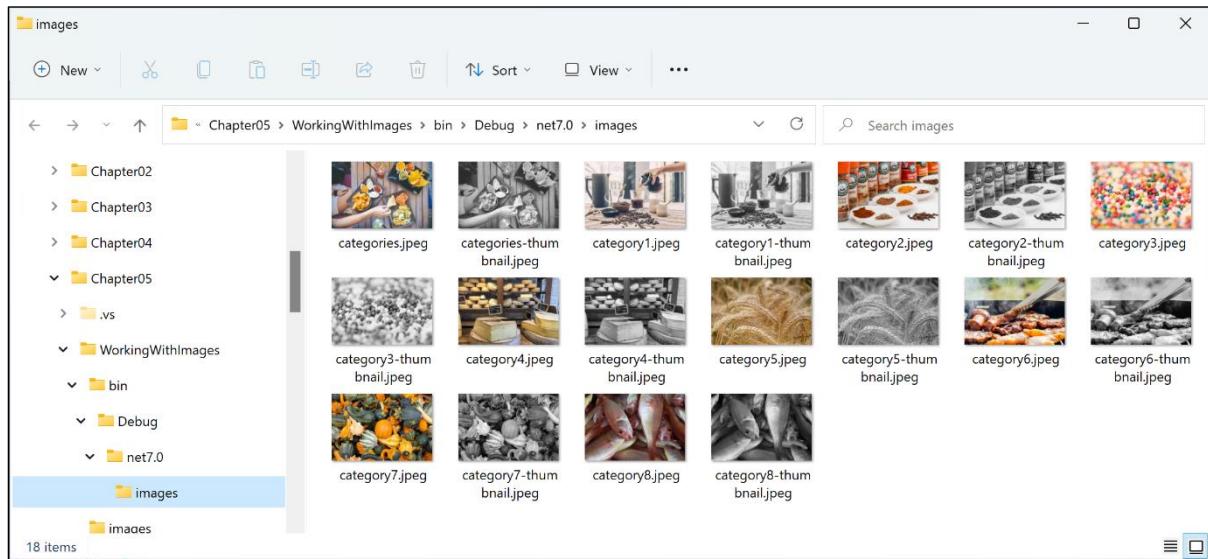


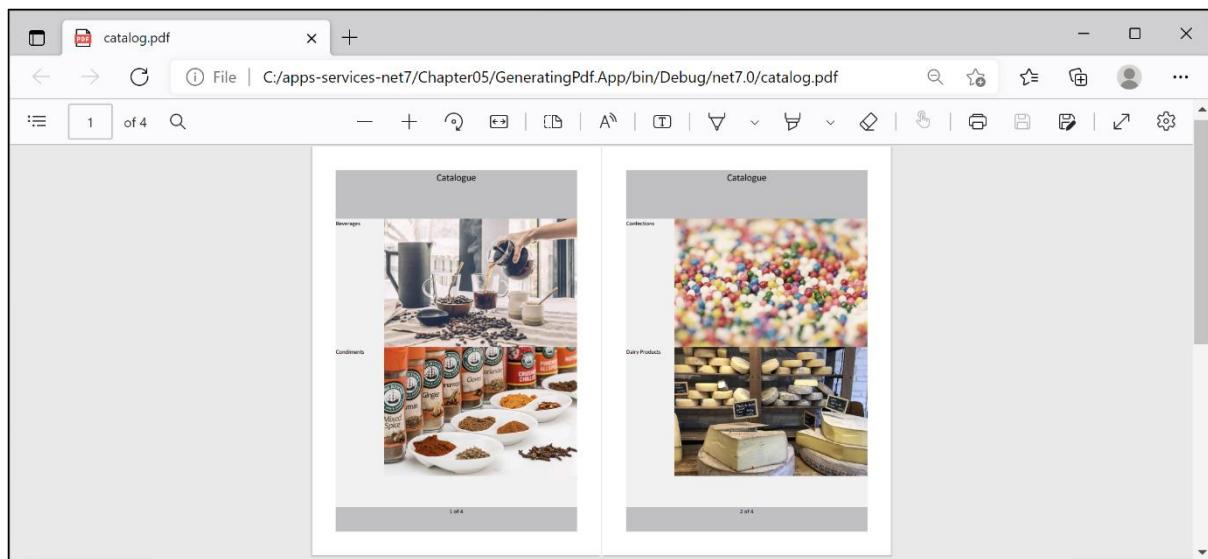
The screenshot shows the Visual Studio IDE. The left pane displays the code editor for `MainWindow.xaml.cs`, which contains C# code for a Windows application. The right pane shows a preview window titled "MainWindow" displaying a list of employees. The preview window has two buttons at the top: "Get Employees Synchronously" and "Get Employees Asynchronously". Below the buttons, there is a text input field containing the placeholder "Type in hereaaaaabbbbbccccccccccccccddddd". The list of employees is as follows:

Index	Name
1	Nancy Davolio
2	Andrew Fuller
3	Janet Leverling
4	Margaret Peacock
5	Steven Buchanan
6	Michael Suyama
7	Robert King
8	Laura Callahan
9	Anne Dodsworth

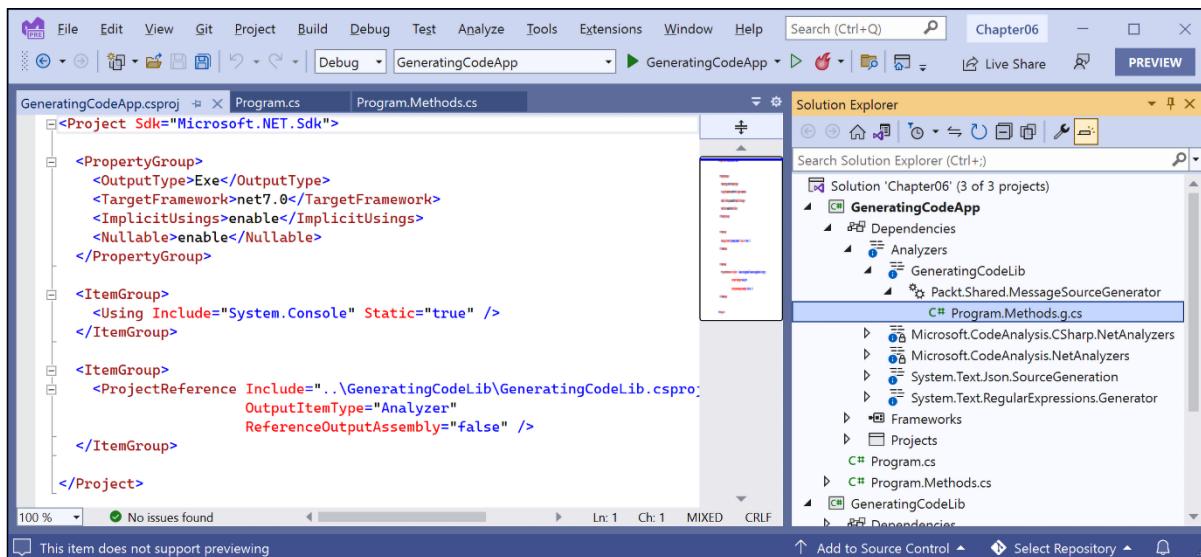
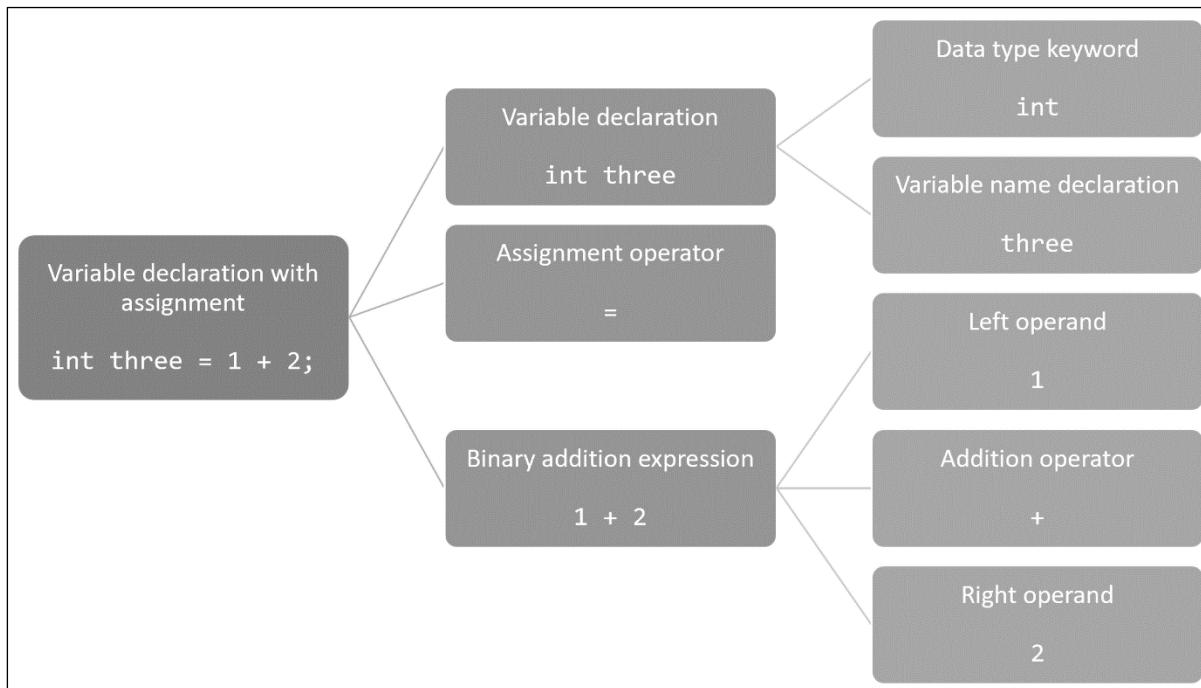
Below the list, performance metrics are shown: "Sync: 5,118ms" and "Async: 5,026ms".

# Chapter 5: Implementing Popular Third-Party Libraries

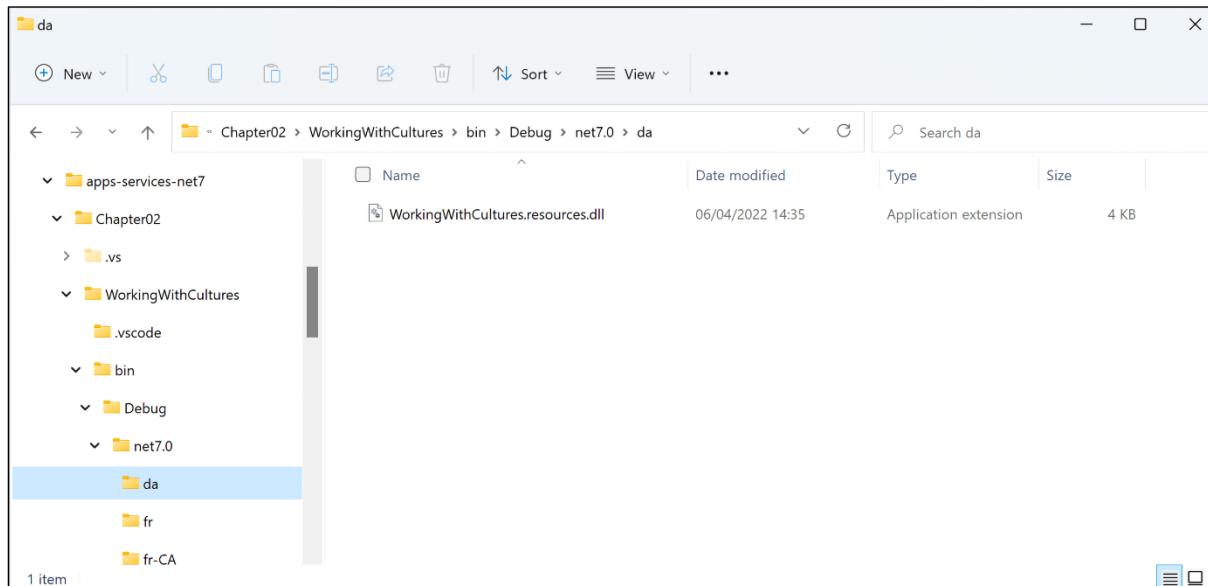




# Chapter 6: Observing and Modifying Code Execution Dynamically



# Chapter 7: Handling Dates, Times, and Internationalization



The screenshot shows the Microsoft Language Portal's Terminology Search interface. The search term 'close' has been entered into the search bar. The results are displayed in a table:

English ↑	Translation	Definition
Close	Fermer	The Holobar button that closes an app or a 3D object.
Close	Fermer	The item in the Start menu that closes the screen opened for "Connect" and "Take me someplace."
Close	Fermer	The mixed reality capture button that closes the Preview UI.
close	clôture	A conclusion of a business interaction.

Below the table, it says "Limited to the first 1,000 matches".

# Chapter 9: Building and Securing Web Services Using Minimal APIs

The screenshot shows the Swagger UI interface for the Northwind.WebApi.Service v1 API. At the top, there's a navigation bar with tabs for 'Swagger UI' and a search bar. Below that is a header with the 'Swagger' logo and a dropdown menu 'Select a definition' set to 'Northwind.WebApi.Service v1'. The main content area is titled 'Northwind.WebApi.Service' with a version '1.0' and an 'OAS3' badge. It lists various API endpoints:

- GET /
- GET /api/products
- POST /api/products
- GET /api/products/outofstock
- GET /api/products/discontinued
- GET /api/products/{id}
- PUT /api/products/{id}
- DELETE /api/products/{id}
- GET /api/products/{name}

The screenshot shows a Visual Studio Code window titled 'webapi-products.http - RestClientTests - Visual Studio Code'. The left sidebar shows a file tree with 'webapi-products.http' expanded, showing code snippets for a GET request to '/api/products/'. The right pane displays the response details:

```
HTTP/1.1 200 OK
Connection: close
Content-Type: application/json; charset=utf-8
Date: Mon, 20 Jun 2022 13:33:36 GMT
Server: Kestrel
Transfer-Encoding: chunked

[
  {
    "productId": 1,
    "productName": "Chai",
    ...
  }
]
```

At the bottom, status bar details include '2.68 KB', '33ms', and file paths for 'Azurite Table Service', 'Azurite Queue Service', and 'Azurite Blob Service'.

File Edit Selection View Go Run Terminal Help

webapi-insert-product.http - RestClientTests - Visual Studio Code

Send Request

```
POST https://localhost:5091/api/products/
Content-Type: application/json

1 {
2   "productName": "Harry's Hamburgers",
3   "supplierId": 7,
4   "categoryId": 6,
5   "quantityPerUnit": "6 per box",
6   "unitPrice": 24.99,
7   "unitsInStock": 0,
8   "unitsOnOrder": 20,
9   "reorderLevel": 10,
10  "discontinued": false
11 }
```

Response(180ms)

```
1 HTTP/1.1 201 Created
2 Connection: close
3 Content-Type: application/json; charset=utf-8
4 Date: Mon, 20 Jun 2022 13:49:54 GMT
5 Server: Kestrel
6 Location: api/products/81
7 Transfer-Encoding: chunked
8
9 {
10   "productId": 81,
11   "productName": "Harry's Hamburgers",
12   "supplierId": 7,
13   "categoryId": 6,
14   "quantityPerUnit": "6 per box",
15   "unitPrice": 24.99,
16   "unitsInStock": 0,
17   "unitsOnOrder": 20,
18   "reorderLevel": 10,
```

Ln 3, Col 1 Spaces: 2 UTF-8 CRLF HTTP No Environment

File Edit Selection View Go Run Terminal Help

Response(34ms) - RestClientTests - Visual Studio Code

Send Request

```
DELETE https://localhost:5091/api/products/81
```

Response(34ms)

```
1 HTTP/1.1 204 No Content
2 Connection: close
3 Date: Mon, 20 Jun 2022 14:02:55 GMT
4 Server: Kestrel
5
6
```

[Azurite Table Service] [Azurite Queue Service] [Azurite Blob Service]

Products using JavaScript - Northwind

localhost:5091

Northwind.WebApi.Client.Mvc Home Privacy

# Products using JavaScript

Go to [Products using .NET](#)

**Product Name**

---

© 2022 - Northwind.WebApi.Client.Mvc - [Privacy](#).

Console

```
Access to XMLHttpRequest at 'https://localhost:5091/api/products/man' from origin 'https://localhost:5092' has been blocked by CORS policy: No 'Access-Control-Allow-Origin' header is present on the requested resource.
> GET https://localhost:5091/api/products/man net::ERR_FAILED 200
(index):78
```

Northwind.WebApi.Client.Mvc Home Privacy

# Products using .NET

Go to [Products using JavaScript](#)

Enter part of a product name  Get Products

**Product Name**

---

[Queso Manchego La Pastora](#)

[Manjimup Dried Apples](#)

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Products using JavaScript - Nort x +

localhost:5092

Northwind.WebApi.Client.Mvc Home Privacy

# Products using JavaScript

Go to [Products using .NET](#)

man  Get Products

**Product Name**

---

[Queso Manchego La Pastora](#)

[Manjimup Dried Apples](#)

Elements Console Sources Network Performance Memory Application Security Lighthouse Recorder > 1 | 1 Issue: 1 | 9 hidden

Filter:  Invert  Hide data URLs All Fetch/XHR JS CSS Img Media Font Doc WS Wasm Manifest Other  Has blocked cookies  Blocked Requests

3rd-party requests

Console

[{"productId":12,"productName":"Queso Manchego La Pastora","supplierId":5,"categoryId":4,"quantityPerUnit":"10 - 500 g (index):60 pkgs.", "unitPrice":38.0000,"unitsInStock":86,"unitsOnOrder":0,"reorderLevel":0,"discontinued":false,"category":null,"supplier":null,"orderDetails":[]}, {"productId":51,"productName":"Manjimup Dried Apples","supplierId":24,"categoryId":7,"quantityPerUnit":"50 - 300 g pkgs.", "unitPrice":53.0000,"unitsInStock":20,"unitsOnOrder":0,"reorderLevel":10,"discontinued":false,"category":null,"supplier":null,"orderDetails":[]}]

# Chapter 10: Exposing Data via the Web Using OData

The screenshot shows the Swagger UI interface for the Northwind.OData.Service v1 API. At the top, there's a header with the Swagger logo and the text "Select a definition" followed by "Northwind.OData.Service v1". Below the header, the title "Northwind.OData.Service" is displayed with a "1.0 OAS3" badge. A link to "https://localhost:5101/swagger/v1/swagger.json" is shown. The main content area is titled "Categories" and lists two GET requests:

- GET /catalog/Categories
- GET /catalog/Categories/\$count

This screenshot shows a detailed view of an API call. The "Request URL" field contains "https://localhost:5101/catalog/\$metadata". Under "Server response", there are tabs for "Code" and "Details", with "Code" selected. The status code is 200, and the "Response body" section displays an XML document representing the EDMX metadata for the service. The XML content includes definitions for EntitySets like "Category" and "Product", their properties (e.g., CategoryId, CategoryName, Description, Picture, ProductId, ProductName, SupplierId), and navigation properties (e.g., Products).

This screenshot shows the expanded list of API operations for the "Categories" endpoint. It includes four entries:

- GET /catalog/Categories
- GET /catalog/Categories/\$count
- GET /catalog/Categories({key})
- GET /catalog/Categories/{key}

```
odata-catalog.http - RestClientTests - Visual Studio Code
File Edit Selection View Go Run Terminal Help
odata-catalog.http > GET /catalog/categories/
Send Request
1 GET https://localhost:5101/catalog/categories/ HTTP/1.1
2
Response(2588ms) ...

1 HTTP/1.1 200 OK
2 Connection: close
3 Content-Type: application/json; odata.metadata=minimal; odata.streaming=true
4 Date: Mon, 15 Aug 2022 07:58:38 GMT
5 Server: Kestrel
6 Transfer-Encoding: chunked
7 OData-Version: 4.0
8
9 {
10   "@odata.context": "https://localhost:5101/catalog/$metadata#Categories",
11   "value": [
12     {
13       "CategoryId": 1,
14       "CategoryName": "Beverages",
15       "Description": "Soft drinks, coffees, teas, beers, and ales",
16       "Picture": "FRwvAAIAAAA4AFAAhAP///9CaXrtYXAgSw1hZ2UAUGFpbnQuUG1jdHVyZQABQAAgAAAACAAABQQnJ1c2gAAAAAAAAACgKQ
...
0 113.01 KB 2588ms [Azurite Queue Service] [Azurite Blob Service] Ln 1, Col 56 Spaces: 4 UFT-8 CRLF HTTP No Environment
```

```
odata-catalog.http >res
odata-catalog.http > GET https://localhost:5101/catalog/categories/
Send Request
1 GET https://localhost:5101/catalog/categories/
2 ###
Send Request
3 https://localhost:5101/catalog/categories/
4 ###
Send Request
5 https://localhost:5101/catalog/categories/3
6 ###
Send Request
7 https://localhost:5101/catalog/categories/$count
8 ###

200 OK
Content-Type: text/plain
Date: Mon, 15 Aug 2022 08:01:25 GMT
Server: Kestrel
Transfer-Encoding: chunked
OData-Version: 4.0
78

[Azurite Table Service] [Azurite Queue Service] [Azurite Blob Service]
```

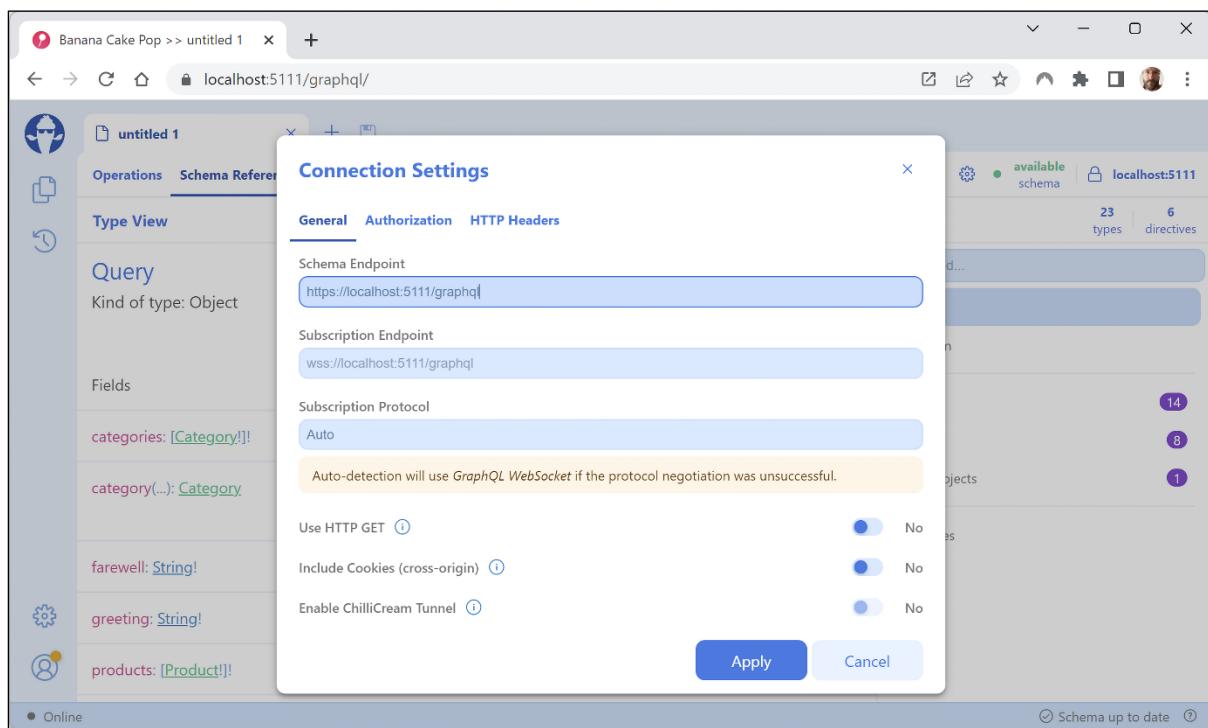
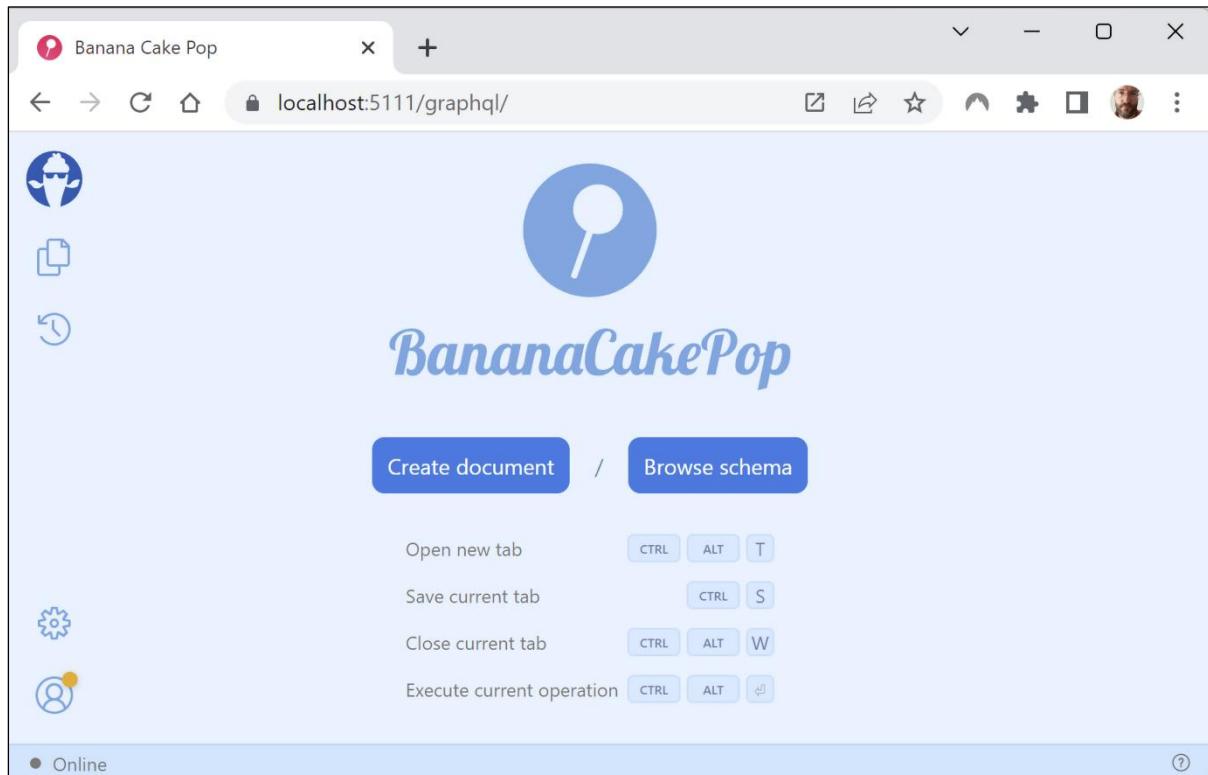
```
ProductsController.cs
Northwind.OData
public IActionResult Post([FromBody] Product product)
{
    db.Products.Add(product);
    db.SaveChanges();
    return Created(product);
}

Locals
Name Value Type
product (Packt.Shared.Product) Packt.Shared.Product
Category null Packt.Shared.Category
CategoryId 6 int?
Discontinued false bool
OrderDetails Count = 0 Q.View System.Collections.Generic...
ProductID 0 int
ProductName "Impossible Burger" Q.View string
QuantityPerUnit "Pack of 4" Q.View string
```

The screenshot shows a web browser window with the following details:

- Title Bar:** Shows "Swagger UI" and "Home Page - Northwind.OData.C" tabs, along with standard browser controls.
- Address Bar:** Displays "localhost:5102".
- Page Content:**
  - The main title is "Home Page".
  - A subtitle reads "Products that start with 'Cha' using OData".
  - Below the subtitle, three blue buttons list products: "1 Chai £18.00", "2 Chang £19.00", and "39 Chartreuse verte £18.00".
  - A search input field contains the text "Cha".
  - Next to the input field is the placeholder text "Press ENTER to search."
- Page Footer:** Shows the copyright notice "© 2022 - Northwind.OData.Client.Mvc - [Privacy](#)".

# Chapter 11: Combining Data Sources Using GraphQL



Banana Cake Pop >> untitled 1

localhost:5111/graphql/

untitled 1

Operations Schema Reference Schema Definition

Operations

Run ▶

1 {greeting}

Variables HTTP Headers

1 ↴ {  
2  
3 }

Response

No results

● Online

Schema up to date

untitled 1

localhost:5111/graphql/

Operations Schema Reference Schema Definition

Operations

Run ▶

1 {greeting}

Variables HTTP Headers

1 ↴ {  
2  
3 }

Response

200 status 18 ms duration 37 B size

1 ↴ {  
2 ↴ "data": {  
3 | "greeting": "Hello, World!"  
4 }  
5 }

query 14:30:53.155 18 ms

Schema up to date

untitled 1

localhost:5111/graphql/

Operations Schema Reference Schema Definition

Operations

Execute

1 ↴ query getNumber {  
2 | rollTheDie  
3 }

Variables HTTP Headers

Response

200 status 4 ms duration 25 B size

1 ↴ {  
2 ↴ "data": {  
3 | "rollTheDie": 5  
4 }  
5 }

getNumber 17:21:16.733 5 ms

getNumber 17:21:17.535 3 ms

getNumber 17:21:18.506 4 ms

The screenshot shows the GraphQL playground interface with the "Schema Definition" tab selected. The schema code is as follows:

```
36 v type Query {  
37   greeting: String!  
38   farewell: String!  
39   rollTheDie: Int!  
40   categories: [Category!]!  
41   category(categoryId: Int!): Category  
42   products: [Product!]!  
43   productsInCategory(categoryId: Int!): [Product!]!  
44 }  
45  
46 v type Category {  
47   categoryId: Int!  
48   categoryName: String!
```

The screenshot shows the GraphQL playground interface with the "Operations" tab selected. An "Execute" query is defined:

```
1 v query AllCategories {  
2   categories {  
3     categoryId  
4     categoryName  
5     description  
6   }  
7 }
```

The "Response" pane shows the JSON response for the "AllCategories" query:

```
1 v {  
2   "data": {  
3     "categories": [  
4       {  
5         "categoryId": 1,  
6         "categoryName": "Beverages",  
7         "description": "Soft drinks, coffees, teas, beer"  
8       },  
9       {  
10        "categoryId": 2,  
11        "categoryName": "Condiments",  
12        "description": "Mustard, Cheese, etc."  
13      }  
14    ]  
15  }  
16 }
```

Details at the bottom: AllCategories, 17:57:23.600, 2 sec.

The screenshot shows the GraphQL playground interface with the "Operations" tab selected. An "Execute" query is defined:

```
1 v query categoryAndItsProducts($id: Int!){  
2   category(categoryId: $id) {  
3     categoryId  
4     categoryName  
5     products {  
6       productId  
7       productName  
8     }  
9   }  
10 }
```

The "Variables" pane shows the variable definition:

```
1 v {  
2   "id": 1  
3 }
```

The "Response" pane shows the JSON response for the "categoryAndItsProducts" query:

```
1 v {  
2   "data": {  
3     "category": {  
4       "categoryId": 1,  
5       "categoryName": "Beverages",  
6       "products": [  
7         {  
8           "productId": 1,  
9           "productName": "Chai"  
10        },  
11        {  
12          "productId": 2,  
13          "productName": "Chang"  
14        },  
15        {  
16          "productId": 24,
```

Details at the bottom: categoryAndItsProducts, 12:09:40.926, 24 ms; categoryAndItsProducts, 12:12:11.022, 17 ms.

A screenshot of Visual Studio Code showing a GraphQL request and its response. The left pane shows a file named "graphql-seafood-products.http" containing a POST request to "https://localhost:5111/graphql" with the following query:

```
POST https://localhost:5111/graphql
Content-Type: application/json
Content-Length: 90

{
  "query" : "{productsInCategory(categoryId:8){pr
}}
```

The right pane shows the response (45ms) with the following headers and body:

```
HTTP/1.1 200 OK
Connection: close
Content-Type: application/json; charset=utf-8
Date: Sun, 11 Sep 2022 13:38:11 GMT
Server: Kestrel
Transfer-Encoding: chunked

{
  "data": {
    "productsInCategory": [
      {
        "productId": 10,
        "productName": "Ikura",
        "unitsInStock": 31
      },
      {
        "productId": 13,
        "productName": "Konbu",
        "unitsInStock": 64
      }
    ]
  }
}
```

A screenshot of a web browser window titled "Products from GraphQL service" at "localhost:5113". The page header shows "Northwind.Mvc.GraphQLClient" and links for "Home" and "Privacy". The main content area has a heading "Products from GraphQL service" and a form with an input field "Enter a category id" and a "Submit" button. Below the form, a message says "There are 12 products." A horizontal list of product names and stock levels follows:

1 Chai - 39 in stock | 2 Chang - 17 in stock | 24 Guaraná Fantástica - 20 in stock | 34 Sasquatch Ale - 111 in stock | 35 Steeleeye Stout - 20 in stock  
38 Côte de Blaye - 17 in stock | 39 Chartreuse verte - 69 in stock | 43 Ipoh Coffee - 17 in stock | 67 Laughing Lumberjack Lager - 52 in stock  
70 Outback Lager - 15 in stock | 75 Rhönbräu Klosterbier - 125 in stock | 76 Lakkaalikööri - 57 in stock

A blue "Show/Hide Details" button is visible below the list. At the bottom of the page, there is a copyright notice: "© 2022 - Northwind.Mvc.GraphQLClient - [Privacy](#)".

The screenshot shows a web browser window titled "Products from GraphQL service". The URL is "localhost:5113/?id=9". The page content is as follows:

# Products from GraphQL service

Enter a category id

Message	Path	Locations
The field 'productid' does not exist on the type 'Product'.	productsInCategory	1, 35

[Show/Hide Details](#)

Status code 400: BadRequest

```
{"errors": [{"message": "The field \u00060productid\u00060 does not exist on the type \u00060Product\u00060.", "locations": [{"line": 1, "column": 35}], "path": ["productsInCategory"], "extensions": {"type": "Product", "field": "productid", "responseName": "productid", "specifiedBy": "http://spec.graphql.org/October2021/#sec-Field-Selections-on-Objects-Interfaces-and-Unions-Types"}} ]}
```

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The screenshot shows the Visual Studio IDE interface. The title bar says "Chapter11" and "PREVIEW". The menu bar includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help. The toolbar has icons for file operations like Open, Save, and Build. The status bar at the bottom shows "Ready".

The main code editor window displays a C# file named "NorthwindClient.StrawberryShake.cs" with the following content:

```
// <auto-generated/>
// nullable enable
namespace Microsoft.Extensions.DependencyInjection
{
    [global::System.CodeDom.Compiler.GeneratedCode("StrawberryShake", "12
0 references
public static partial class NorthwindClientServiceCollectionExtension
{
    1 reference
    public static global::StrawberryShake.IClientBuilder<global::Nort
11
12        var serviceCollection = new global::Microsoft.Extensions.Depe
13        global::Microsoft.Extensions.DependencyInjection.ServiceColle
14            ConfigureClientDefault(sp, serviceCollection, strategy);
15            return new ClientServiceProvider(global::Microsoft.Exten
16});
```

The Solution Explorer on the right shows the project structure for "Chapter11" (3 of 3 projects):

- Northwind.GraphQL
- Northwind.GraphQL.Client.Console
  - Dependencies
  - Imports
  - .config
  - bin
  - Generated
    - C# NorthwindClient.StrawberryShake.cs
- Northwind.Mvc.GraphQLClient

Other files visible in the Solution Explorer include .graphqlrc.json, Program.cs, schema.extensions.graphql, schema.graphql, seafoodProducts.graphql, and Northwind.Mvc.GraphQLClient.

The screenshot shows the GraphQL playground interface with the title "untitled 1". The "Schema Definition" tab is selected. The schema code is as follows:

```
46 ∵ type Mutation {  
47   addProduct(input: AddProductInput!): AddProductPayload!  
48 }  
49  
50 ∵ type Product {  
51   productId: Int!  
52   productName: String!
```

The screenshot shows the GraphQL playground interface with the title "untitled 1". The "Operations" tab is selected. An operation named "AddProduct" is being executed. The query is:

```
1 ∵ mutation AddProduct {  
2   addProduct(  
3     input: {  
4       productName: "Tasty Burgers"  
5       supplierId: 1  
6       categoryId: 2  
7       quantityPerUnit: "6 per box"  
8       unitPrice: 40  
9       unitsInStock: 0  
10      unitsOnOrder: 0  
11      reorderLevel: 0  
12      discontinued: false  
13    }  
14  }  
15  {  
16    product {  
17      productId  
18      productName  
19    }  
20  }
```

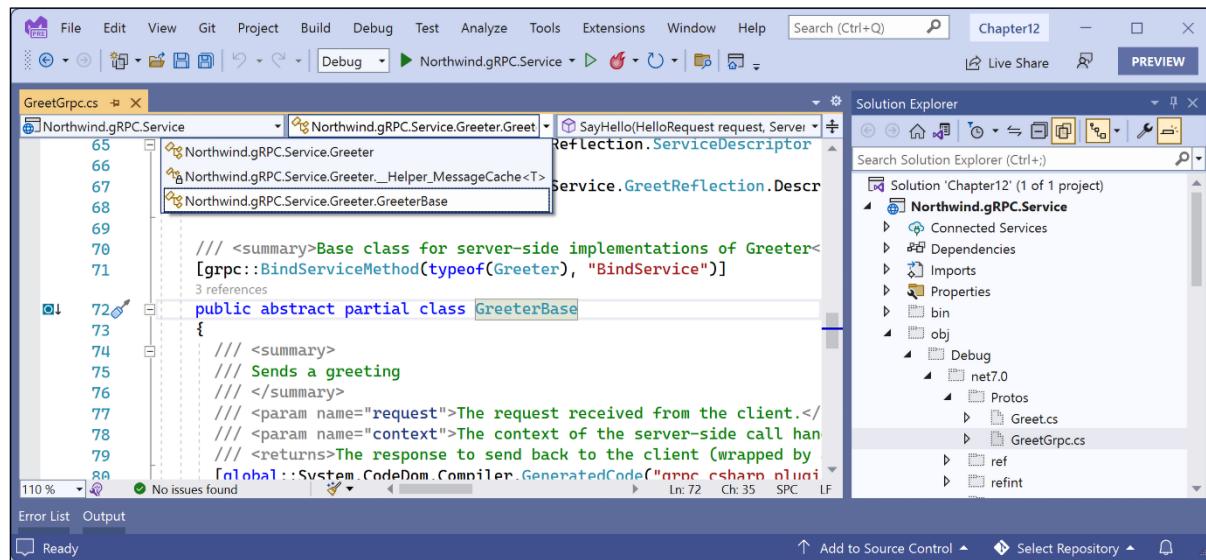
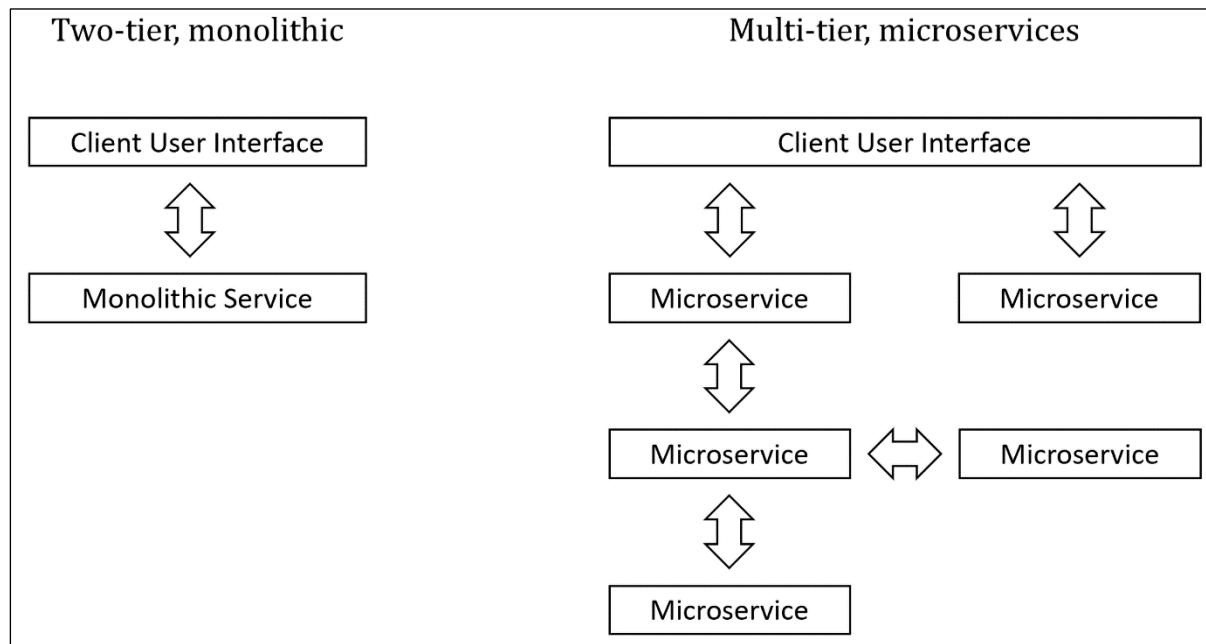
The "Response" tab shows the JSON response from the server:

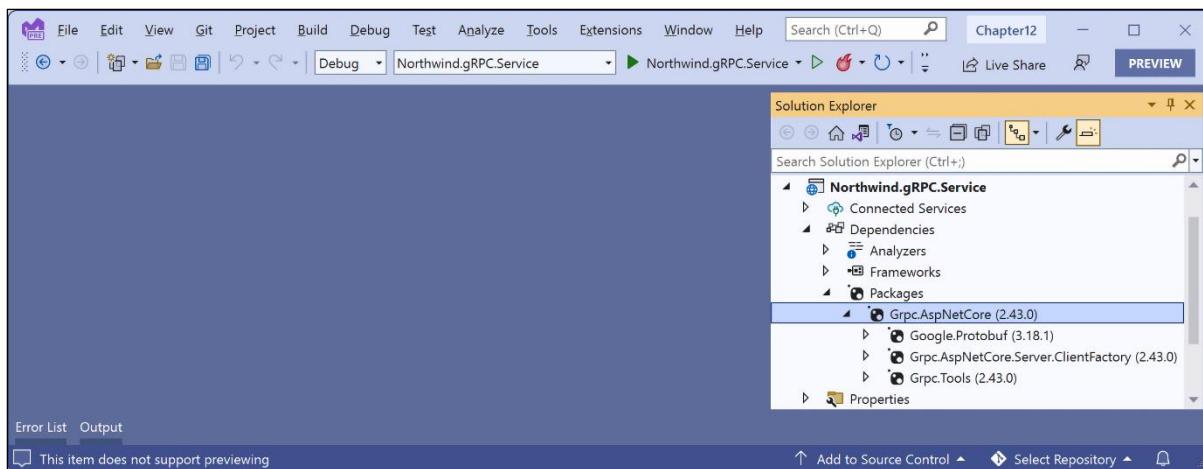
```
1 ∵ {  
2   ∵ "data": {  
3     ∵ "addProduct": {  
4       ∵ "product": {  
5         ∵ "productId": 79,  
6         "productName": "Tasty Burgers"  
7       }  
8     }  
9   }  
10 }
```

Transport details: 200 status, 831 ms duration, 82 B size.

At the bottom, it says: 14:47:34.775 831 ms

# Chapter 12: Building Efficient Microservices Using gRPC





Northwind.Grpc.Client.Mvc Home Privacy

# Welcome

Enter your name  Submit

Greeting from gRPC service: Hello Henrietta

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A screenshot of a web browser showing the "Welcome" page of the "Northwind.Grpc.Client.Mvc" application. The page has a header with "Northwind.Grpc.Client.Mvc" and links to "Home" and "Privacy". The main content area contains a heading "Welcome", a form with a text input field and a "Submit" button, and a blue box containing the text "Greeting from gRPC service: Hello Henrietta". At the bottom, there is a copyright notice: "© 2022 - Northwind.Grpc.Client.Mvc - [Privacy](#)".

Northwind.Grpc.Client.Mvc Home Privacy

# Welcome

Enter your name  Submit  
Enter a shipper id  Submit

Greeting from gRPC service: Hello Henrietta

Shipper from gRPC service: ID: 1, Name: Speedy Express, Phone: (503) 555-9831.

© 2022 - Northwind.Grpc.Client.Mvc - [Privacy](#)

A screenshot of a web browser showing the "Welcome" page of the "Northwind.Grpc.Client.Mvc" application. The page has a header with "Northwind.Grpc.Client.Mvc" and links to "Home" and "Privacy". The main content area contains a heading "Welcome", a form with two text input fields and two "Submit" buttons, and two blue boxes. The top blue box contains the text "Greeting from gRPC service: Hello Henrietta". The bottom blue box contains the text "Shipper from gRPC service: ID: 1, Name: Speedy Express, Phone: (503) 555-9831.". At the bottom, there is a copyright notice: "© 2022 - Northwind.Grpc.Client.Mvc - [Privacy](#)".

```
C:\apps-services-net\Chapter 12> .\Northwind.Grpc.Client.Mvc.exe

info: Microsoft.Hosting.Lifetime[0]
      Content root path: C:\apps-services-net\Chapter 12\Northwind.Grpc.Client.Mvc
info: System.Net.Http.HttpClient.Greeter.LogicalHandler[100]
      Start processing HTTP request POST https://localhost:5121/greet.Greeter/SayHello
info: System.Net.Http.HttpClient.Greeter.ClientHandler[100]
      Sending HTTP request POST https://localhost:5121/greet.Greeter/SayHello
info: System.Net.Http.HttpClient.Greeter.ClientHandler[101]
      Received HTTP response headers after 61.0357ms - 200
info: System.Net.Http.HttpClient.Greeter.LogicalHandler[101]
      End processing HTTP request after 66.4856ms - 200
info: System.Net.Http.HttpClient.Shipper.LogicalHandler[100]
      Start processing HTTP request POST https://localhost:5121/shipper.Shipper/GetShipper
info: System.Net.Http.HttpClient.Shipper.ClientHandler[100]
      Sending HTTP request POST https://localhost:5121/shipper.Shipper/GetShipper
info: System.Net.Http.HttpClient.Shipper.ClientHandler[101]
      Received HTTP response headers after 15.5113ms - 200
info: System.Net.Http.HttpClient.Shipper.LogicalHandler[101]
      End processing HTTP request after 15.6476ms - 200
crit: Northwind.Grpc.Client.Mvc.Controllers.HomeController[0]
      Key: date, Value: Wed, 01 Jun 2022 14:04:25 GMT
crit: Northwind.Grpc.Client.Mvc.Controllers.HomeController[0]
      Key: server, Value: Kestrel
```

The screenshot shows a web browser window titled "Home Page - Northwind.Grpc.Client.Mvc". The address bar indicates the URL is "localhost:5121". The page content includes a header with "Northwind.Grpc.Client.Mvc" and links for "Home" and "Privacy". Below the header is a large "Welcome" heading. A form contains two input fields: "Enter your name" and "Enter a shipper id", each with a "Submit" button. A blue horizontal bar displays the message "Greeting from gRPC service: Hello Henrietta". A pink horizontal bar below it shows the error message "Status(StatusCode="DeadlineExceeded", Detail="Deadline Exceeded")". At the bottom of the page is a footer with the copyright notice "© 2022 - Northwind.Grpc.Client.Mvc - [Privacy](#)".

The screenshot shows the Network tab in the Chrome DevTools. The URL in the address bar is `https://localhost:5121/v1/greeter/Bob`. The response body contains the JSON object `{"message": "Hello Bob"}`. The Network timeline shows a single request taking approximately 600ms. The Response panel shows the following headers:

Header	Value
content-type	application/json; charset=utf-8
date	Mon, 12 Sep 2022 10:00:12 GMT
server	Kestrel

The screenshot shows the Network tab in the Chrome DevTools. The URL in the address bar is `https://localhost:5121/v1/shipper/2`. The response body contains the JSON object `{"shipperId": 2, "CompanyName": "United Package", "Phone": "(503) 555-3199"}`. The Network timeline shows a single request taking approximately 9000ms. The Response panel shows the following headers:

Header	Value
content-type	application/json; charset=utf-8
date	Mon, 12 Sep 2022 10:02:55 GMT
server	Kestrel

# Chapter 13: Broadcasting Real-Time Communication Using SignalR

The screenshot shows a web browser window titled "SignalR Chat - Northwind.SignalR" at "localhost:5131". The page has a header with "Northwind.SignalR.Service.Client.Mvc" and links for "Home" and "Privacy". Below the header is the title "SignalR Chat".  
**Left Side:** A "Register User" form with fields for "My name" (Alice) and "My groups" (Sales,IT). A "Register User" button is highlighted with a blue border.  
**Right Side:** A "Send Message" form with fields for "From" (Alice), "To" (empty), "Body" (empty), and a "Send Message" button.  
**Bottom Section:** A "Messages received" section containing a message: "To Alice, From SignalR Hub: You have successfully registered as a new user with connection id L4lrO67hM36lp0b9192kRw."  

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The screenshot shows three separate instances of the SignalR Chat application running simultaneously.

- Instance 1 (Left):** Shows Alice registering with "My name" and "My groups" (Sales,IT). The "Register User" button is highlighted.
- Instance 2 (Middle):** Shows Bob registering with "My name" and "My groups" (Sales). The "Register User" button is highlighted.
- Instance 3 (Right):** Shows Charlie registering with "My name" and "My groups" (IT). The "Register User" button is highlighted.

In all three instances, the "Messages received" sections show the confirmation messages for each registration:

- Alice's instance: "To Alice, From SignalR Hub: You have successfully registered as a new user with connection id L4lrO67hM36lp0b9192kRw."  
Followed by "To Group: Sales, From Alice: Sell more!"
- Bob's instance: "To Bob, From SignalR Hub: You have successfully registered as a new user with connection id f5oM07\_GfP8JNzP47W8t6w."  
Followed by "To Group: Sales, From Alice: Sell more!"
- Charlie's instance: "To Charlie, From SignalR Hub: You have successfully registered as a new user with connection id 1FbXlWC7BjQ4EymN9g4kuQ."

SignalR Chat	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Alice"/>	From <input type="text" value="Alice"/>
My groups <input type="text" value="Sales,IT"/>	To <input type="text" value="Sales"/>
<input type="button" value="Register User"/>	Body <input type="text" value="Sell more!"/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Alice, From SignalR Hub: You have successfully registered as a new user with connection id QnOZfC-WojrrfmrN1MDqQ.</li> <li>• To Group: Sales, From Alice: Sell more!</li> <li>• To Group: IT, From Bob: Fix more bugs!</li> </ul>	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Bob"/>	From <input type="text" value="Bob"/>
My groups <input type="text" value="Sales"/>	To <input type="text" value="IT"/>
<input type="button" value="Register User"/>	Body <input type="text" value="Fix more bugs!"/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Bob, From SignalR Hub: You have successfully registered as a new user with connection id f5oM07_Gfp8JNP47W8t6w.</li> <li>• To Group: Sales, From Alice: Sell more!</li> </ul>	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Charlie"/>	From <input type="text" value="Charlie"/>
My groups <input type="text" value="IT"/>	To <input type="text" value=""/>
<input type="button" value="Register User"/>	Body <input type="text" value=""/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Charlie, From SignalR Hub: You have successfully registered as a new user with connection id 1FbxIWC7Bjq4EYmN9g4kuQ.</li> <li>• To Group: IT, From Bob: Fix more bugs!</li> </ul>	

SignalR Chat	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Alice"/>	From <input type="text" value="Alice"/>
My groups <input type="text" value="Sales,IT"/>	To <input type="text" value="Bob"/>
<input type="button" value="Register User"/>	Body <input type="text" value="Bonjour Bob!"/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Alice, From SignalR Hub: You have successfully registered as a new user with connection id QnOZfC-WojrrfmrN1MDqQ.</li> <li>• To Group: Sales, From Alice: Sell more!</li> <li>• To Group: IT, From Bob: Fix more bugs!</li> <li>• To Everyone, From Charlie: Everybody dance now!</li> </ul>	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Bob"/>	From <input type="text" value="Bob"/>
My groups <input type="text" value="Sales"/>	To <input type="text" value="IT"/>
<input type="button" value="Register User"/>	Body <input type="text" value="Fix more bugs!"/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Bob, From SignalR Hub: You have successfully registered as a new user with connection id f5oM07_Gfp8JNP47W8t6w.</li> <li>• To Group: Sales, From Alice: Sell more!</li> <li>• To User: Bob, From Alice: Bonjour Bob!</li> <li>• To Everyone, From Charlie: Everybody dance now!</li> </ul>	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Charlie"/>	From <input type="text" value="Charlie"/>
My groups <input type="text" value="IT"/>	To <input type="text" value=""/>
<input type="button" value="Register User"/>	Body <input type="text" value="Everybody dance now!"/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Charlie, From SignalR Hub: You have successfully registered as a new user with connection id 1FbxIWC7Bjq4EYmN9g4kuQ.</li> <li>• To Group: IT, From Bob: Fix more bugs!</li> <li>• To Everyone, From Charlie: Everybody dance now!</li> </ul>	

SignalR Chat	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Alice"/>	From <input type="text" value="Alice"/>
My groups <input type="text" value="Sales,IT"/>	To <input type="text" value="Bob"/>
<input type="button" value="Register User"/>	Body <input type="text" value="Bonjour Bob!"/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Alice, From SignalR Hub: You have successfully registered as a new user with connection id QnOZfC-WojrrfmrN1MDqQ.</li> <li>• To Group: Sales, From Alice: Sell more!</li> <li>• To Group: IT, From Bob: Fix more bugs!</li> <li>• To Everyone, From Charlie: Everybody dance now!</li> <li>• To User: Alice, From Charlie: Is anyone in HR listening?</li> </ul>	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Bob"/>	From <input type="text" value="Bob"/>
My groups <input type="text" value="Sales"/>	To <input type="text" value="IT"/>
<input type="button" value="Register User"/>	Body <input type="text" value="Fix more bugs!"/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Bob, From SignalR Hub: You have successfully registered as a new user with connection id f5oM07_Gfp8JNP47W8t6w.</li> <li>• To Group: Sales, From Alice: Sell more!</li> <li>• To User: Bob, From Alice: Bonjour Bob!</li> <li>• To Everyone, From Charlie: Everybody dance now!</li> </ul>	
<b>Register User</b>	<b>Send Message</b>
My name <input type="text" value="Charlie"/>	From <input type="text" value="Charlie"/>
My groups <input type="text" value="IT"/>	To <input type="text" value="HR,Alice"/>
<input type="button" value="Register User"/>	Body <input type="text" value="Is anyone in HR listening?"/>
	<input type="button" value="Send Message"/>
<b>Messages received</b>	
<ul style="list-style-type: none"> <li>• To Charlie, From SignalR Hub: You have successfully registered as a new user with connection id 1FbxIWC7Bjq4EYmN9g4kuQ.</li> <li>• To Group: IT, From Bob: Fix more bugs!</li> <li>• To Everyone, From Charlie: Everybody dance now!</li> </ul>	

## Register User

My name

My groups

## Send Message

From

To

Body

---

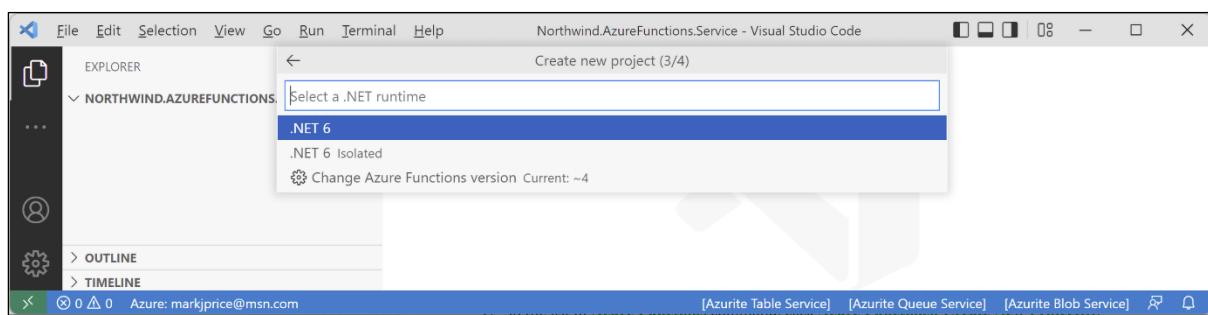
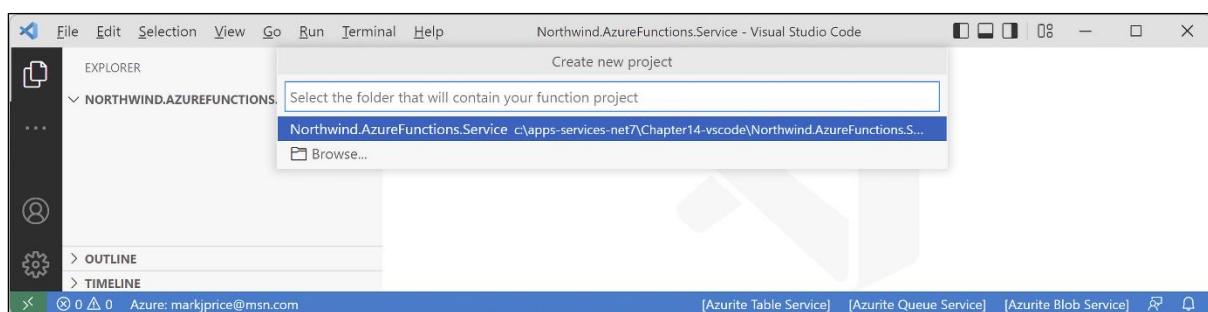
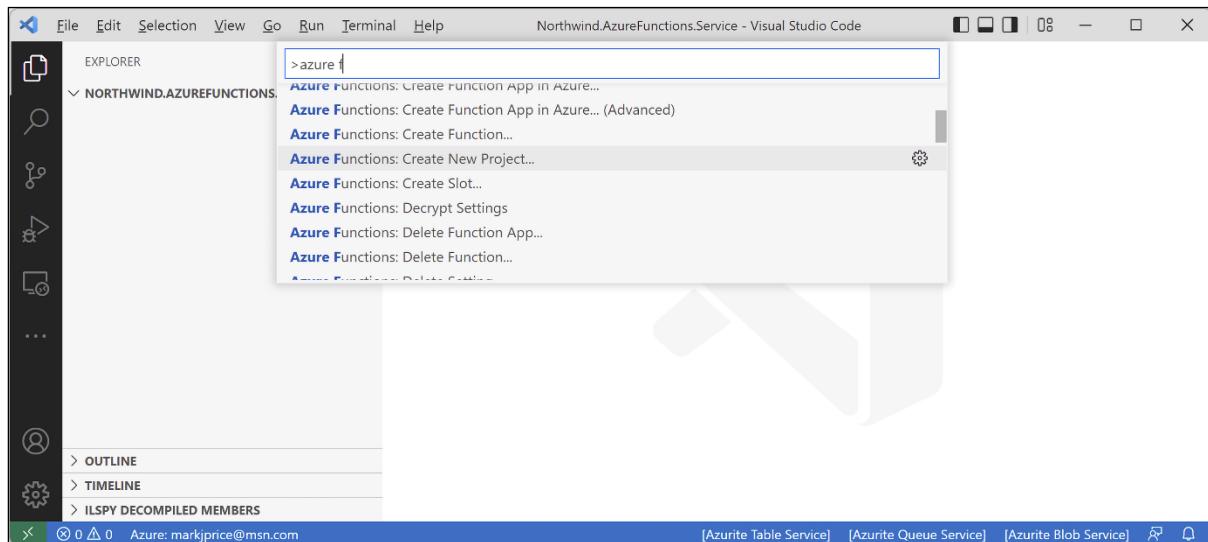
### Messages received

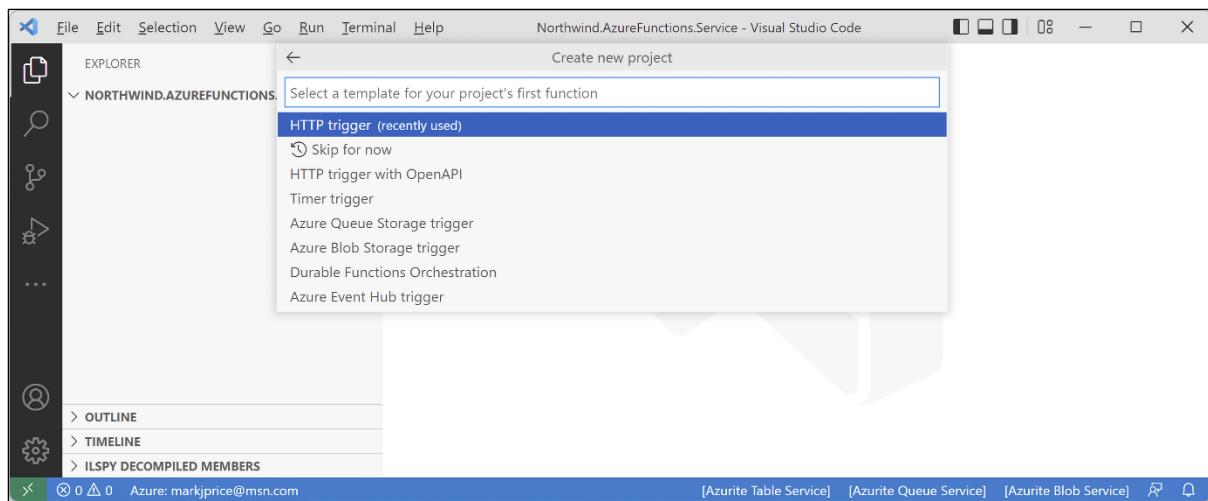
- To Alice, From SignalR Hub: You have successfully registered as a new user with connection id 83KtH-q4MTYPKfVHxx1gqq.
- To Group: Sales, From Alice: Go team!

```
C:\apps-services-net\Chapter 7
```

Enter a username (required): Mark  
Enter your groups (optional): Sales,Admins  
Successfully started.  
Listening... (press ENTER to stop.)  
To Mark, From SignalR Hub: You have successfully registered as a new user with connection id qdX0bvtRjYfPncWu9  
987TQ.  
To Group: Sales, From Alice: Go team!

# Chapter 14: Building Serverless Nanoservices Using Azure Functions





```
C:\Users\markj\AppData\Loc... + ▾
Azure Functions Core Tools
Core Tools Version: 4.0.4544 Commit hash: N/A (64-bit)
Function Runtime Version: 4.3.2.18186

[2022-06-03T11:27:13.041Z] Found C:\apps-services-net7\Chapter14\Northwind.AzureFunctions.Service\Northwind.AzureFunctions.Service.csproj. Using for user secrets file configuration.

Functions:

NumbersToWordsFunction: [GET,POST] http://localhost:7071/api/NumbersToWordsFunction

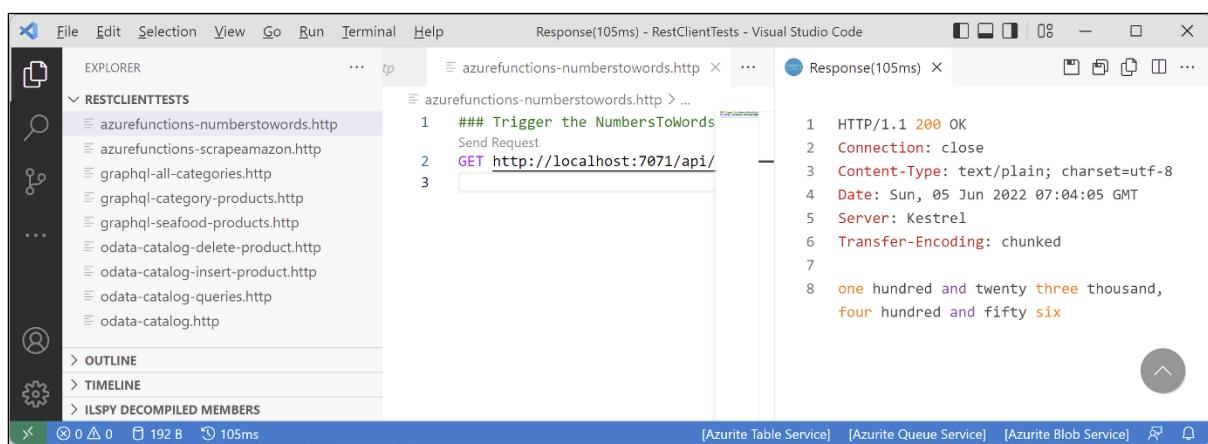
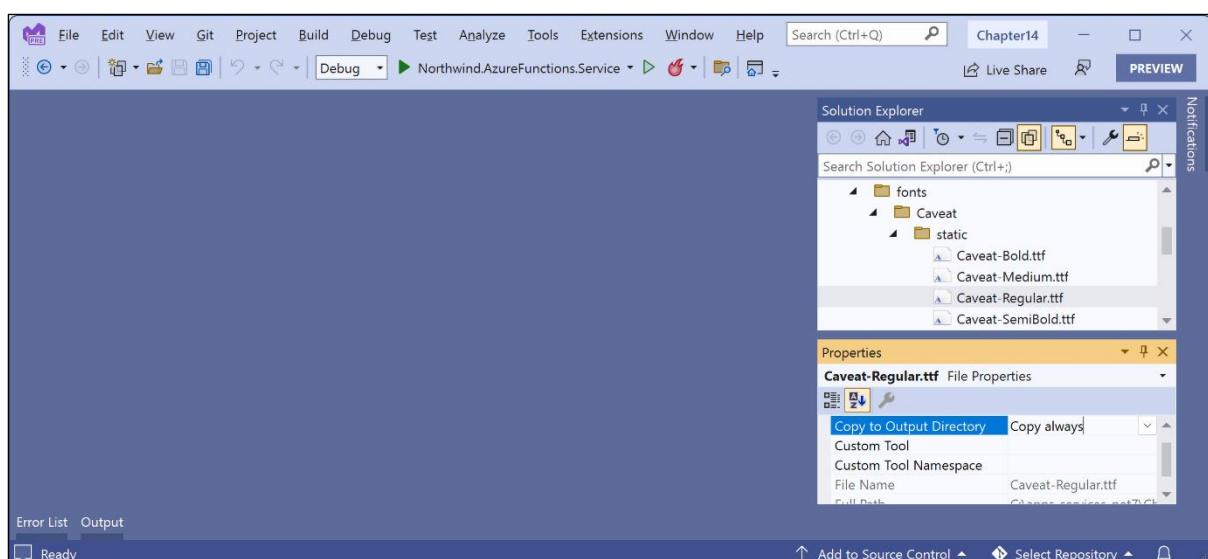
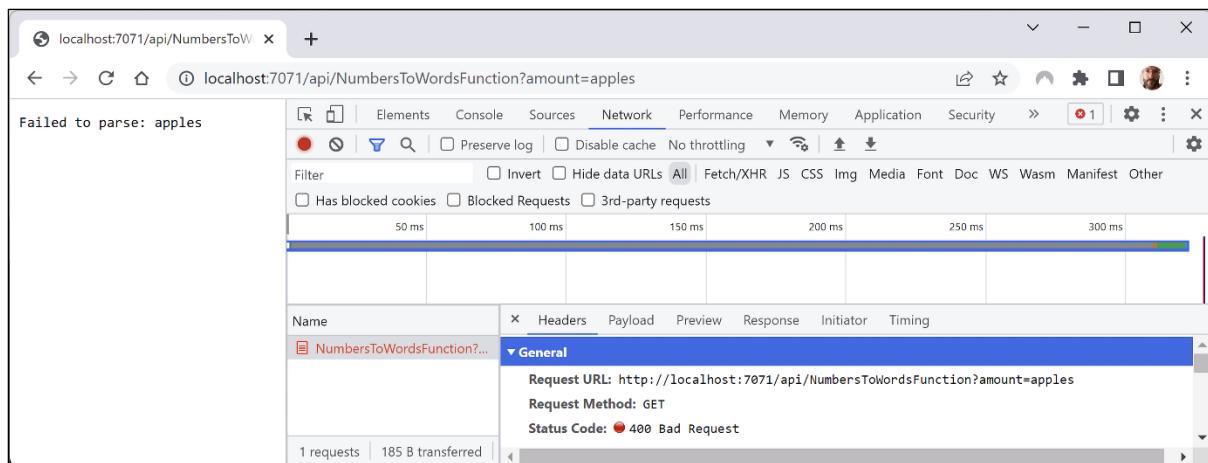
For detailed output, run func with --verbose flag.
[2022-06-03T11:27:21.937Z] Host lock lease acquired by instance ID '00000000000000000000000011150C3D'.
```

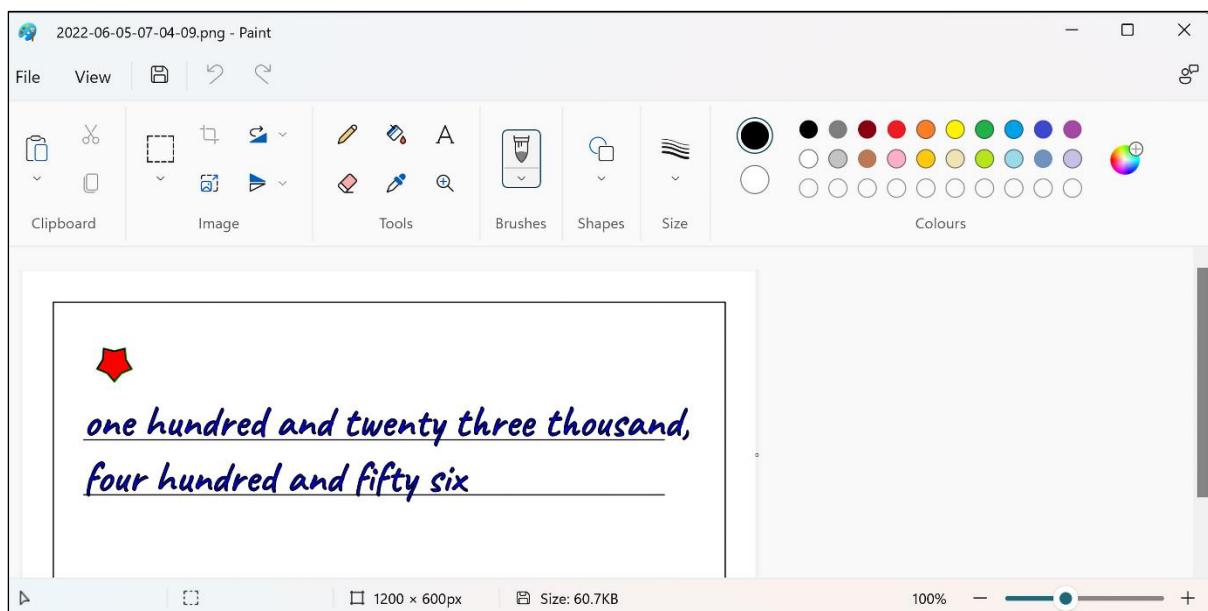
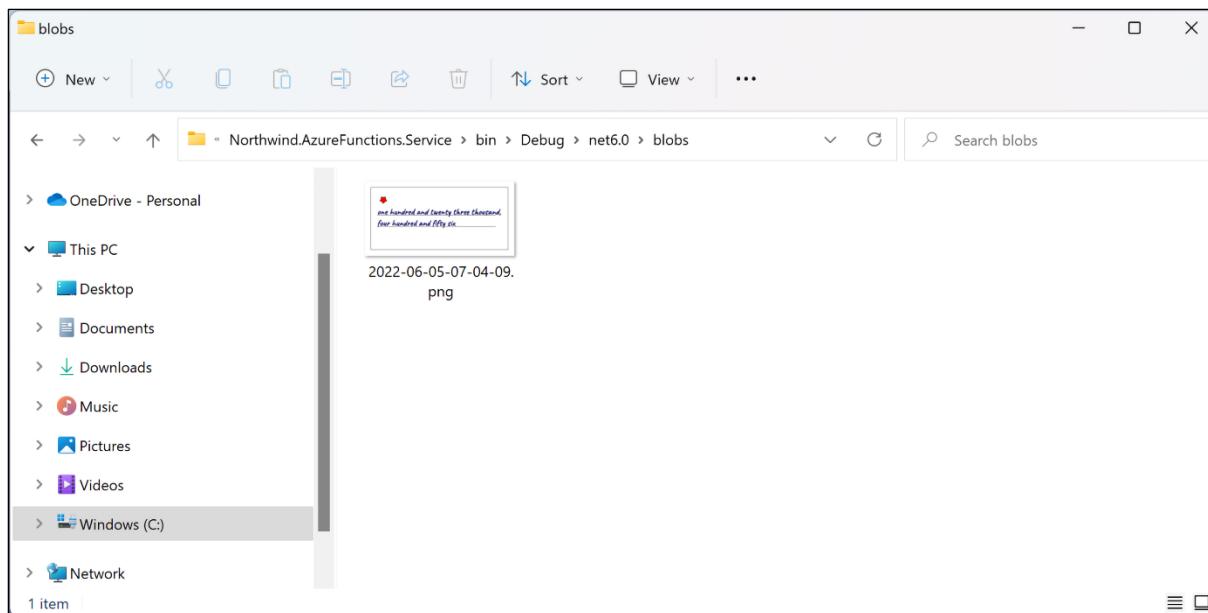
```
localhost:7071/api/NumbersToW... + ▾
← → ⌂ ⓘ localhost:7071/api/NumbersToWordsFunction?amount=123456
one hundred and twenty three thousand, four hundred and fifty six

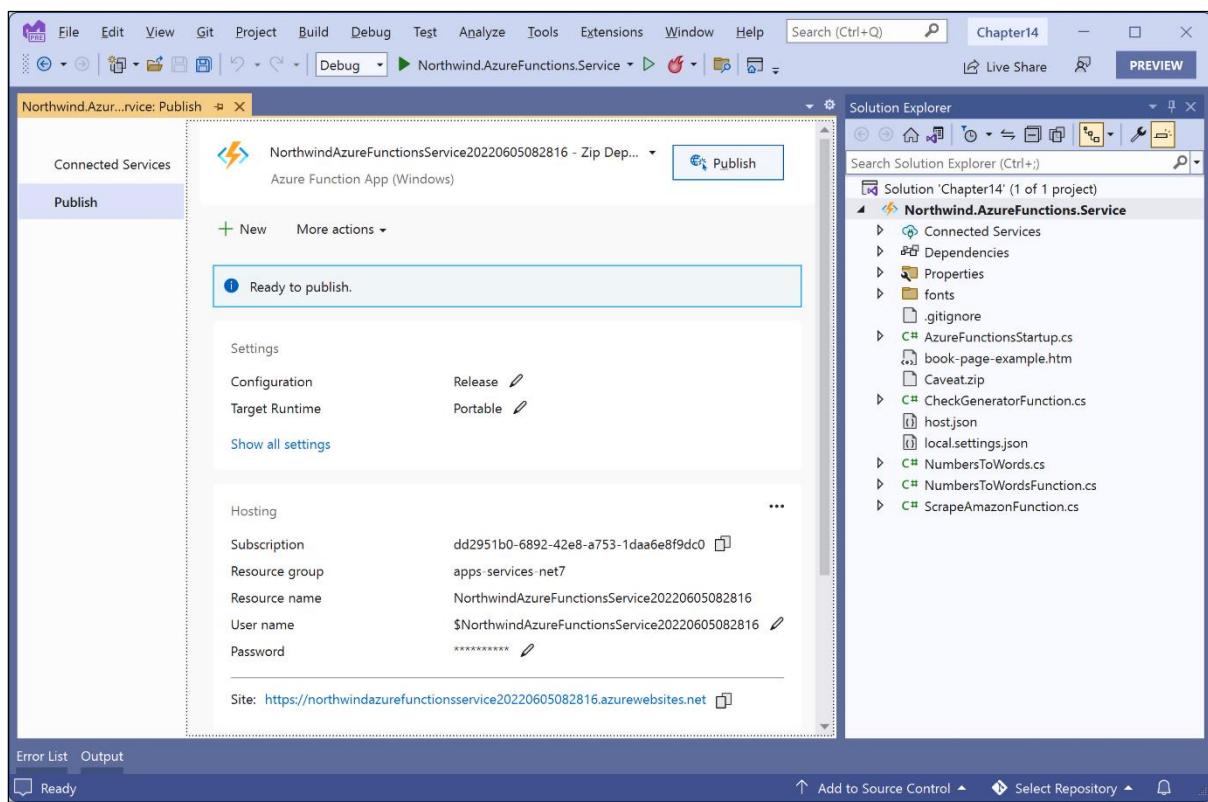
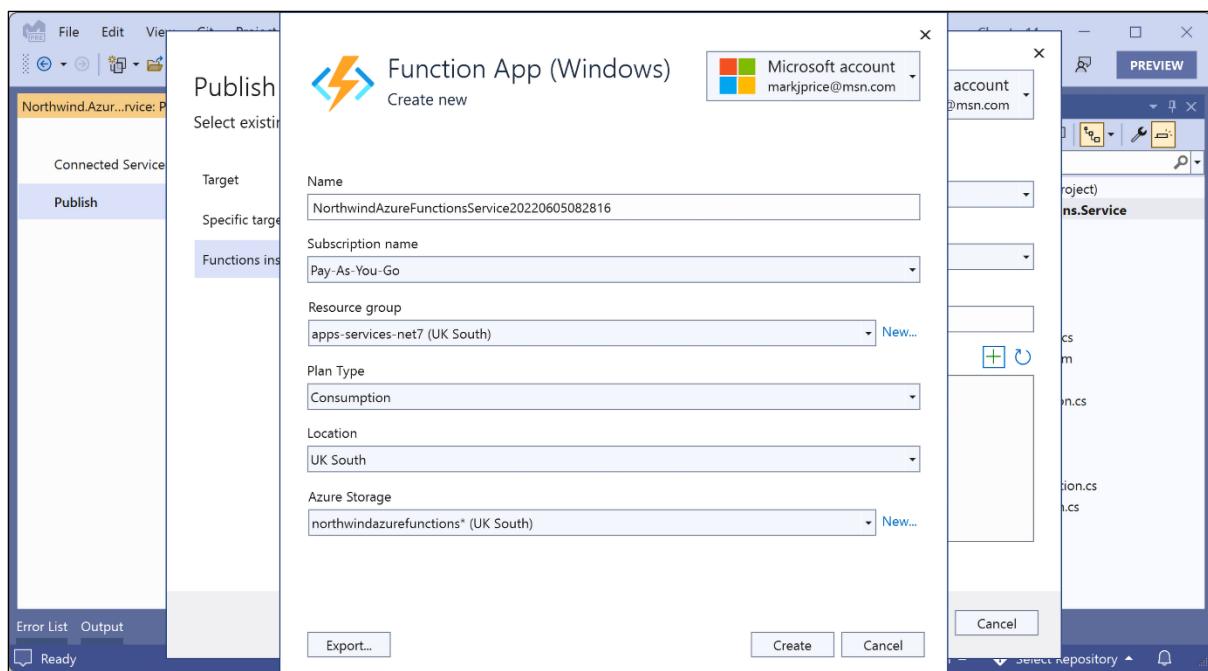
C:\Users\markj\AppData\Loc... + ▾
Functions:

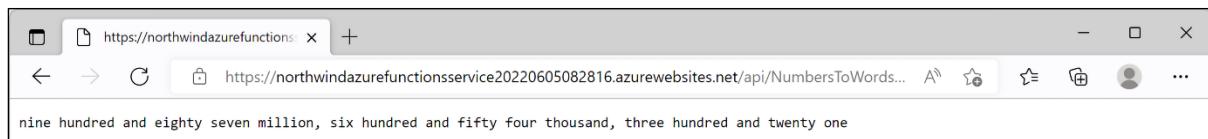
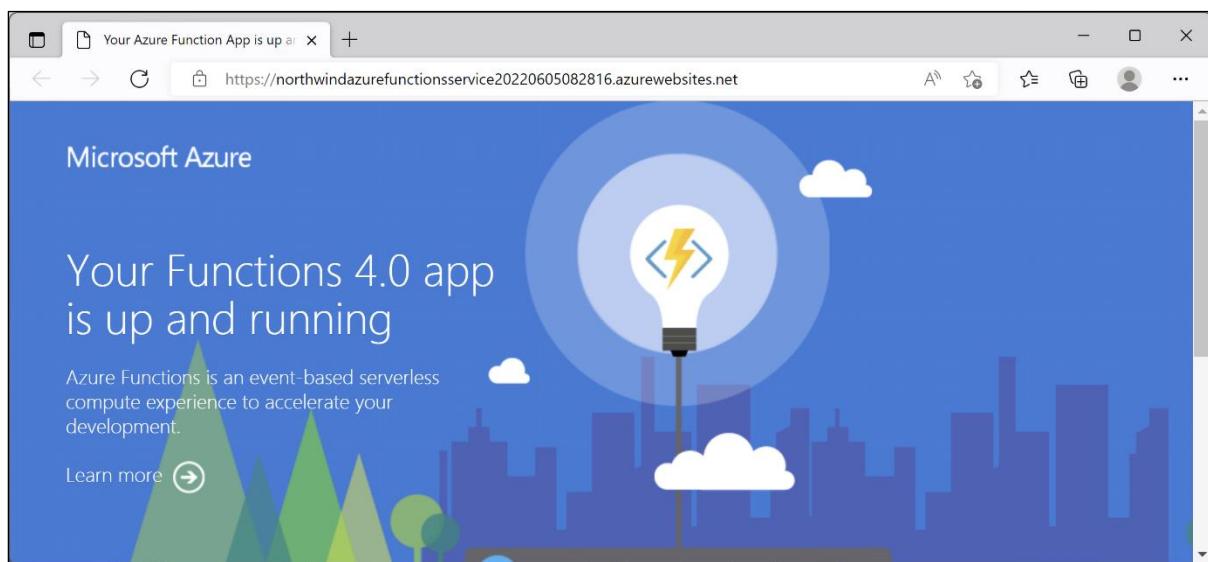
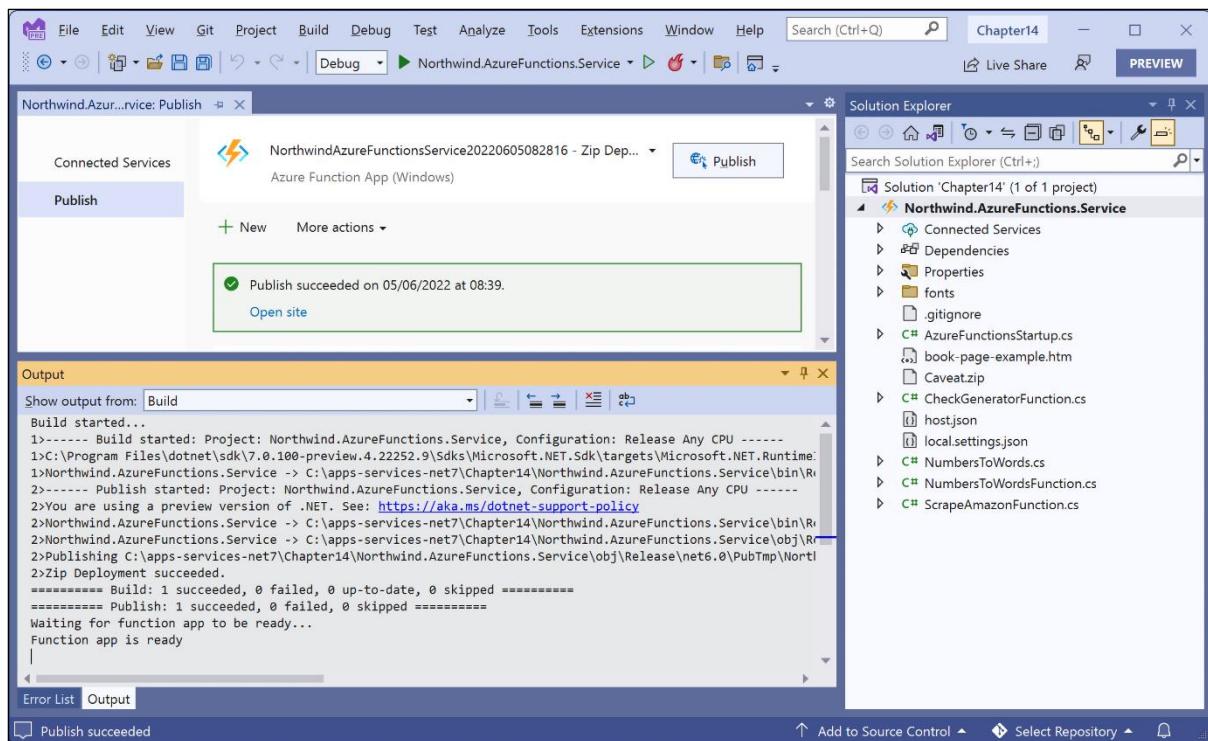
NumbersToWordsFunction: [GET,POST] http://localhost:7071/api/NumbersToWordsFunction

For detailed output, run func with --verbose flag.
[2022-06-03T11:27:21.937Z] Host lock lease acquired by instance ID '00000000000000000000000011150C3D'.
[2022-06-03T11:32:51.574Z] Executing 'NumbersToWordsFunction' (Reason='This function was programmatically called via the host APIs.', Id=234d3122-ff3d-4896-94b3-db3c8b5013d8)
[2022-06-03T11:32:51.603Z] C# HTTP trigger function processed a request.
[2022-06-03T11:32:51.629Z] Executed 'NumbersToWordsFunction' (Succeeded, Id=234d3122-ff3d-4896-94b3-db3c8b5013d8, Duration=96ms)
```









apps-services-net7 - Microsoft Edge

https://portal.azure.com/#@markjpricemsn.onmicrosoft.com/resource/subscriptions/dd2951b0-6...

Microsoft Azure Search resources, services, and docs (G+)

markjprice@msn.com JUMPADVANCE

Dashboard > Resource groups >

**apps-services-net7** Resource group

Search (Ctrl+ /) Create Manage view Delete resource group Refresh Export to CSV Open query ...

Overview

Activity log Access control (IAM) Tags Resource visualizer Events

Subscriptions (move) Pay-As-You-Go

Subscription ID dd2951b0-6892-42e8-a753-1daa6e8f9dc0

Deployments 2 Succeeded

Location UK South

Tags (edit) Click here to add tags

Resources Recommendations

Filter for any field... Type = all Location = all Add filter

Showing 1 to 3 of 3 records.  Show hidden types No grouping List view

Name	Type	Location
northwindazurefunctions	Storage account	UK South
NorthwindAzureFunctionsService20220605082816	Function App	UK South
UKSouthPlan	App Service plan	UK South

< Page 1 of 1 > Give feedback

JSON View

Overview

Activity log Access control (IAM) Tags Resource visualizer Events

Subscriptions (move) Pay-As-You-Go

Subscription ID dd2951b0-6892-42e8-a753-1daa6e8f9dc0

Deployments 2 Succeeded

Location UK South

Tags (edit) Click here to add tags

Resources Recommendations

Filter for any field... Type = all Location = all Add filter

Showing 1 to 3 of 3 records.  Show hidden types No grouping List view

Name	Type	Location
northwindazurefunctions	Storage account	UK South
NorthwindAzureFunctionsService20220605082816	Function App	UK South
UKSouthPlan	App Service plan	UK South

< Page 1 of 1 > Give feedback

JSON View

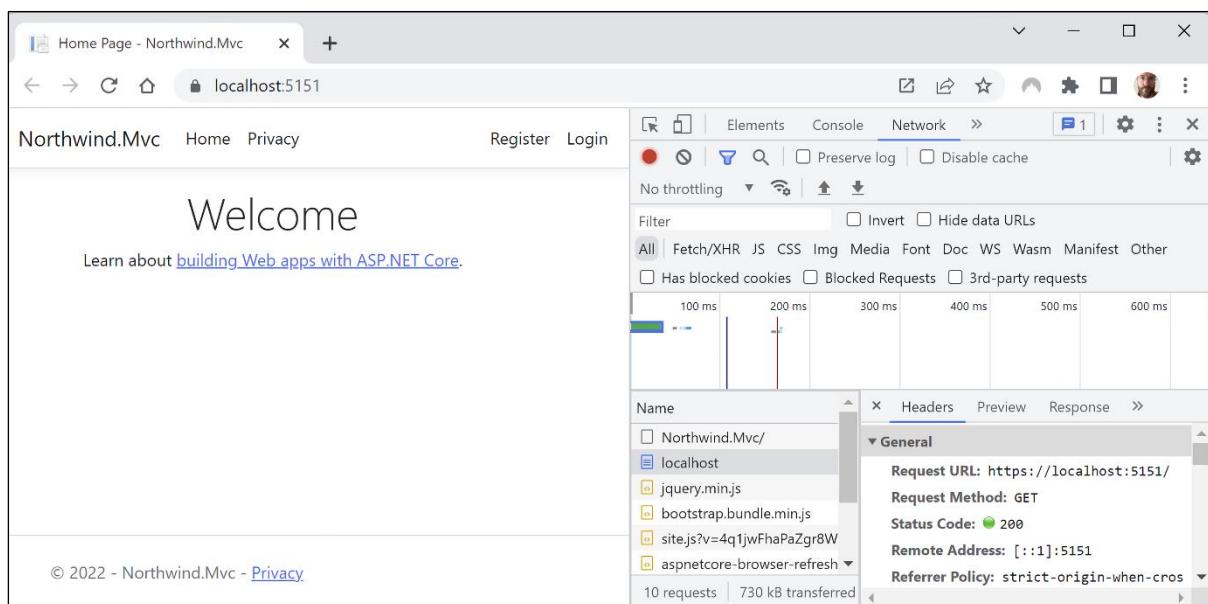
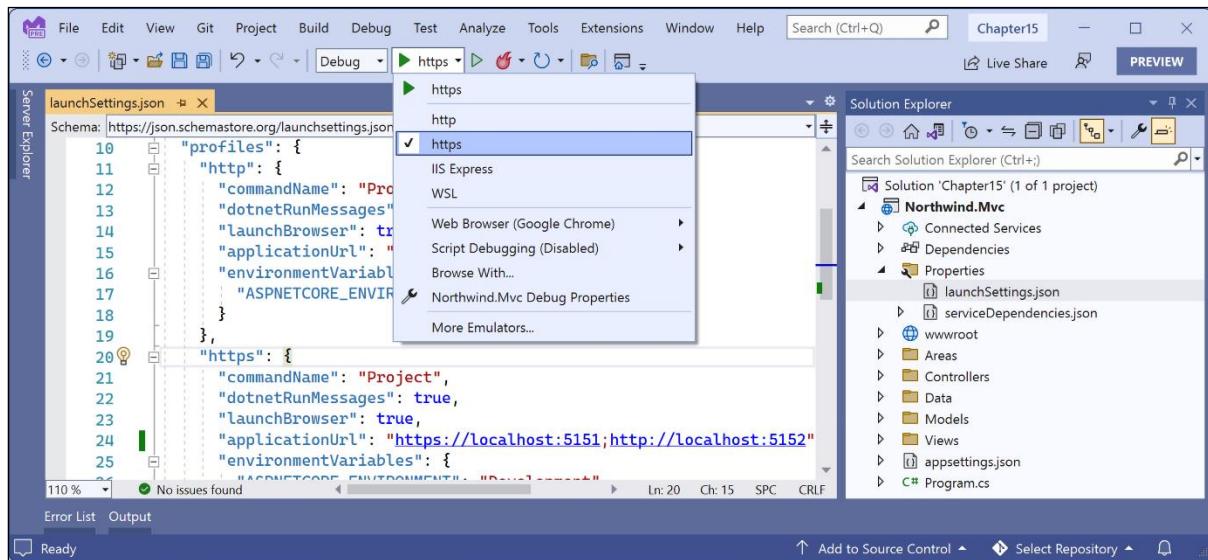
Deployments

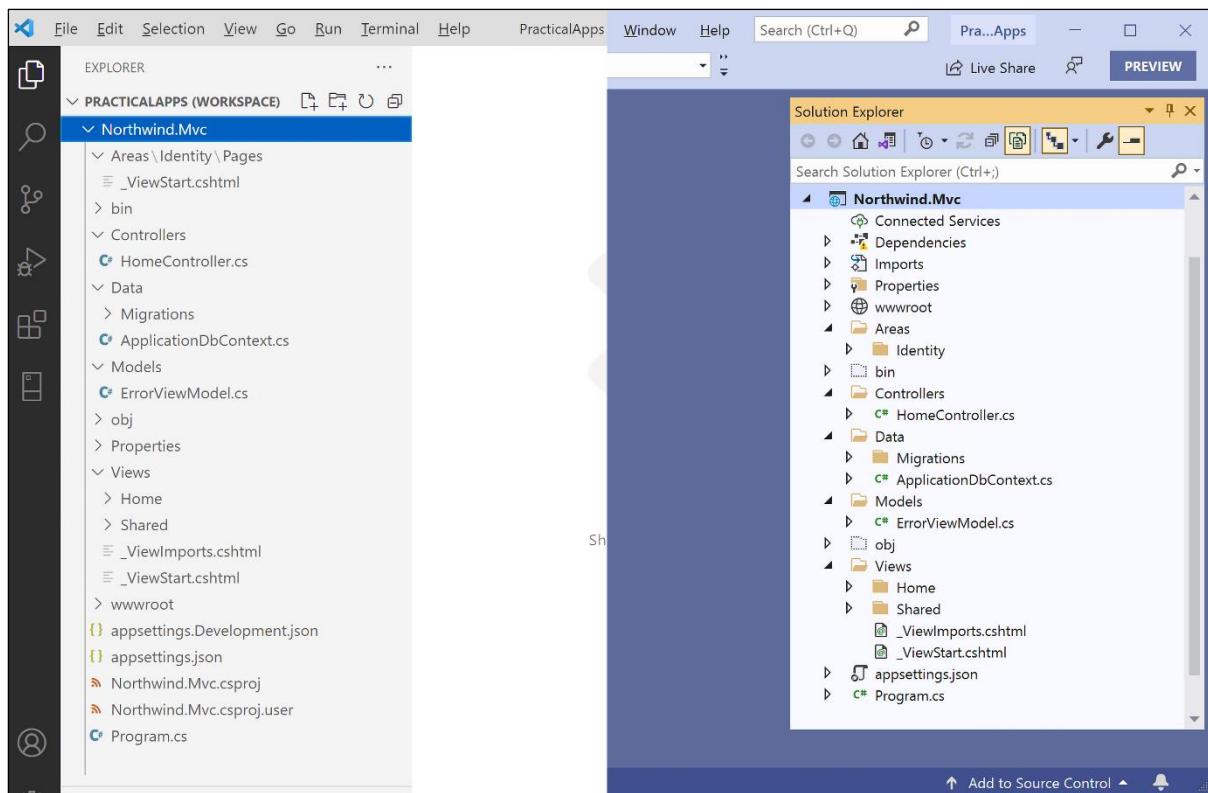
Security Policies Properties Locks

Cost Management

Cost analysis Cost alerts (preview) Budgets Advisor recommendations

# Chapter 15: Building Web User Interfaces Using ASP.NET Core





A screenshot of a web browser displaying the Bootstrap v5.0 documentation for buttons. The URL is 'getbootstrap.com/docs/5.0/components/buttons/'. The page features a sidebar with links like 'Getting started' and 'Customize'. In the center, there's a grid of colored buttons labeled 'Primary', 'Secondary', 'Success', 'Danger', 'Warning', 'Info', 'Light', and 'Dark'. On the right, there's a 'On this page' sidebar with links to 'Examples', 'Disable text wrapping', and other components.

A screenshot of a web browser displaying the Bootstrap v5.0 documentation for badges. The URL is 'getbootstrap.com/docs/5.0/components/badge/'. The page features a sidebar with links like 'Getting started', 'Customize', 'Layout', 'Content', 'Forms', and 'Components' (with sub-links for Accordion, Alerts, Badge, Breadcrumb, etc.). The main content area is titled 'Pill badges' and shows a grid of colored pill-shaped badges. Below the grid is some sample HTML code for creating rounded badges. On the right, there's a 'On this page' sidebar with links to 'Examples', 'Headings', 'Buttons', 'Positioned', 'Background colors', 'Pill badges', 'Sass', and 'Variables'.

Orders

Order ID	Order Date	Company Name	Country	Item Count	Order Total
10865	02 February 1998	QUICK-Stop	Germany	2	£17,250.00
11030	17 April 1998	Save-a-lot Markets	USA	4	£16,321.90
10981	27 March 1998	Hanari Carnes	Brazil	1	£15,810.00
10372	04 December 1996	Queen Cozinha	Brazil	4	£12,281.20
10424	23 January 1997	Mère Paillardé	Canada	3	£11,493.20

Index.en-US.resx

Name	Value	Comment
Company Name	Company Name	
Country	Country	
Item Count	Item Count	
Order Date	Order Date	
Order ID	Order ID	
Order Total	Order Total	
Orders	Orders (USA)	

Solution Explorer

- Resources
- Views
- Home
  - Index.en-US.resx
  - Index.cshtml
  - Privacy.cshtml
- Shared

The screenshot shows the Google Chrome Settings page with the search bar set to "lang". The left sidebar includes options like You and Google, Auto-fill, Privacy and security, Appearance, Search engine, Default browser, On start-up, Languages, and Downloads. The main content area is titled "Languages" and displays the following information:

Order languages based on your preference

- French (France)
- English (United Kingdom)  
This language is used when translating pages  
This language is used to display the Google Chrome UI
- English (United States)
- English

[Add languages](#)

The screenshot shows the Google Chrome Settings page with the search bar set to "french". A modal dialog titled "Add languages" is open, containing a search input field with "french" typed into it. Below the search field is a list of language options:

- French - français
- French (Canada) - français (Canada)
- French (France) - français (France)
- French (Switzerland) - français (Suisse)

At the bottom of the dialog are "Cancel" and "Add" buttons.

Commandes (France) - Northwind

localhost:5151

Northwind.Mvc Home Privacy Register Login

## Commandes (France)

Numéro de commande	Date de commande	Nom de l'entreprise	Pays	Nombre d'éléments	Total de la commande
10865	lundi 2 février 1998	QUICK-Stop	Germany	2	17 250,00 €
11030	vendredi 17 avril 1998	Save-a-lot Markets	USA	4	16 321,90 €
10981	vendredi 27 mars 1998	Hanari Carnes	Brazil	1	15 810,00 €
10372	mercredi 4 décembre 1996	Queen Cozinha	Brazil	4	12 281,20 €
10424	jeudi 23 janvier 1997	Mère Paillarde	Canada	3	11 493,20 €

Orders (USA) - Northwind.Mvc

localhost:5151

Northwind.Mvc Home Privacy Register Login

## Orders (USA)

Order ID	Order Date	Company Name	Country	Item Count	Order Total
10865	Monday, February 2, 1998	QUICK-Stop	Germany	2	\$17,250.00
11030	Friday, April 17, 1998	Save-a-lot Markets	USA	4	\$16,321.90
10981	Friday, March 27, 1998	Hanari Carnes	Brazil	1	\$15,810.00
10372	Wednesday, December 4, 1996	Queen Cozinha	Brazil	4	\$12,281.20

Network tab in developer tools showing a request to localhost for / with various headers and a response time of 400 ms.

Privacy Policy - Northwind.Mvc

localhost:5151/Home/Privacy

Northwind.Mvc Home Privacy Register Login

# Privacy Policy

Use this page to detail your site's privacy policy.

Orders This Page Orders for Alfre... Futterkiste Orders in Brazil

© 2022 - Northwind.Mvc - [Privacy](#)

Elements Console Sources Network Performance Memory Application Security Lighthouse Recorder

Styles Computed Layout Event Listeners

```
<h1>Privacy Policy</h1>
<p>Use this page to detail your site's privacy policy.</p>
<p>
    <a class="btn btn-primary" href="/">Orders</a>
    <a class="btn btn-outline-primary" href="/Home/Privacy">This Page</a>
    <a class="btn btn-outline-primary" href="/Home/Index/ALFKI">Orders for Alfre... Futterkiste</a>
    <a class="btn btn-outline-primary" href="/?country=Brazil">Orders in Brazil</a>
</p>
```

body { margin-bottom: 60px; }

Privacy Policy - Northwind.Mvc

localhost:5151/Home/Privacy

Northwind.Mvc Home Privacy Register Login

# Privacy Policy

Use this page to detail your site's privacy policy.

Orders This Page Orders for Alfre... Futterkiste Orders in Brazil Orders (end of table) Shipper

© 2022 - Northwind.Mvc - [Privacy](#)

Elements Console Sources Network Performance Memory Application Security Lighthouse Recorder

Styles Computed

```
<h1>Privacy Policy</h1>
<p>Use this page to detail your site's privacy policy.</p>
<p>
    <a class="btn btn-primary" href="/">Orders</a>
    <a class="btn btn-outline-primary" href="https://localhost:5151/Home/Privacy">This Page</a>
    <a class="btn btn-outline-primary" href="/Home/Index/ALFKI">Orders for Alfre... Futterkiste</a>
    <a class="btn btn-outline-primary" href="/?country=Brazil">Orders in Brazil</a>
    <a class="btn btn-outline-primary" href="#endOfTable">Orders (end of table)</a>
    <a class="btn btn-outline-primary" href="/Home/Shipper?ShipperId=1&CompanyName=Speedy%20Express&Phone=(503)%20555-9831">Shipper</a>
</p>
```

body { margin-bottom: 60px; }

Shippers - Northwind.Mvc

localhost:5151/Home/Shipper?ShipperId=1&CompanyName=Speedy%20Express&Phone=(503)%20...

Northwind.Mvc Home Privacy Register Login

## Shippers

Shipper Id  
1

Company Name  
Speedy Express

Phone  
(503) 555-9831

© 2022 - Northwind.Mvc - [Privacy](#)

Orders (USA) - Northwind.Mvc

localhost:5151

Northwind.Mvc Home Privacy Register Login

## Orders (USA)

Live UTC: Sunday, July 24, 2022 at 10:28:59 AM

Cached UTC: Sunday, July 24, 2022 at 10:28:47 AM

Order ID	Order Date	Company Name	Country	Item Count	Order Total
10865	Monday, February 2, 1998	QUICK-Stop	Germany	2	\$17,250.00

Privacy Policy - Northwind.Mvc

localhost:5151/Home/Privacy

Northwind.Mvc Home Privacy Register Login

## Privacy Policy

**Attention developers and testers**

This is a warning that only developers and testers will see. Current environment: **Development**

Use this page to detail your site's privacy policy.

Orders This Page Orders for Alfre... Orders in Brazil Orders (end of table) Shipper

 Privacy Policy - Northwind.Mvc x +  
localhost:5151/Home/Privacy  
Northwind.Mvc Home Privacy Register Login  

# Privacy Policy

Welcome, visitor!

This is information that only a visitor to the production website will see. Current environment: Production

Use this page to detail your site's privacy policy.

[Orders](#) [This Page](#) [Orders for Alfre...  
d's Futterkiste](#) [Orders in Brazil](#) [Orders \(end of table\)](#) [Shipper](#)

```
83 <h2>With Form Tag Helper</h2>
84 <form class="form-horizontal" role="form" action="/Home/ProcessShipper" method="post">
85   <div>
86     <div class="mb-3">
87       <label class="form-label" for="ShipperId" />
88       <input class="form-control" type="number" data-val="true" data-val-required="The ShipperId field is required." id="ShipperId" name="ShipperId" value="1" data-bbox="110 250 907 280" data-label="Text-Field"/>
89     </div>
90     <div class="mb-3">
91       <label class="form-label" for="CompanyName" />
92       <input class="form-control" type="text" data-val="true" data-val-length="The field CompanyName must be a string with a maximum length of 40." id="CompanyName" name="CompanyName" value="Speedy Express" data-bbox="110 350 907 380" data-label="Text-Field"/>
93     </div>
94     <div class="mb-3">
95       <label class="form-label" for="Phone" />
96       <input class="form-control" type="text" data-val="true" data-val-length="The field Phone must be a string with a maximum length of 24." id="Phone" name="Phone" value="505-123-4567" data-bbox="110 450 907 480" data-label="Text-Field"/>
97     </div>
98     <div class="mb-3">
99       <input type="submit" class="form-control" value="Submit" data-bbox="110 550 907 580" data-label="Submit-Button"/>
100     </div>
101   </div>
102 <input name="__RequestVerificationToken" type="hidden" value="CfDJ8NTt08jabvBCqd1P4J-HCq3X9CDrTPjBphdDdVmG6UT06FBjK1w7F10LmNT-jEGjl6IJfv3kmNUao1" data-bbox="110 650 907 680" data-label="Hidden-Field"/>
```

With Form Tag Helper

99

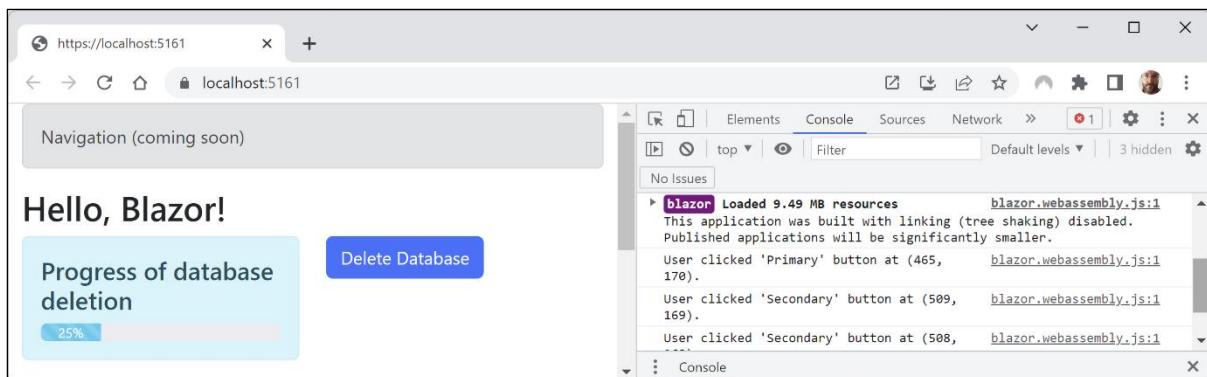
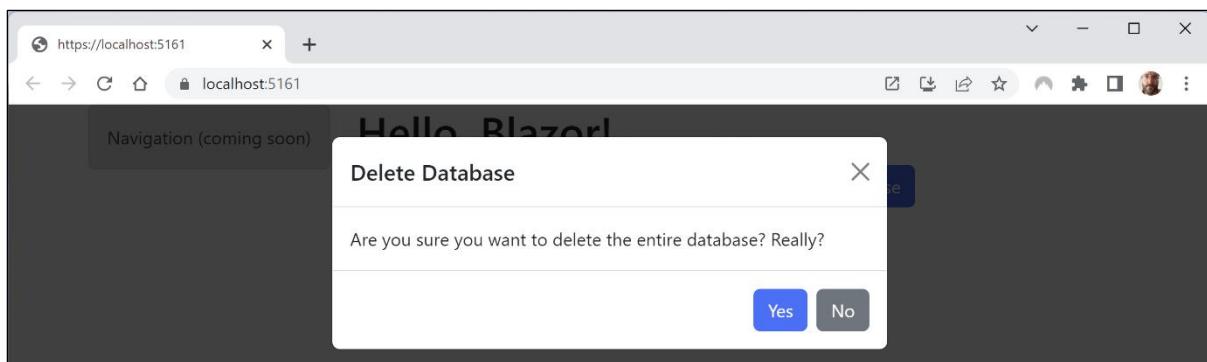
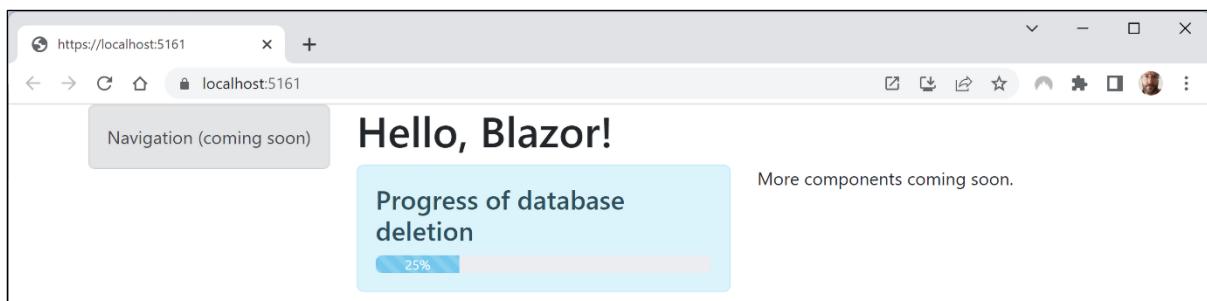
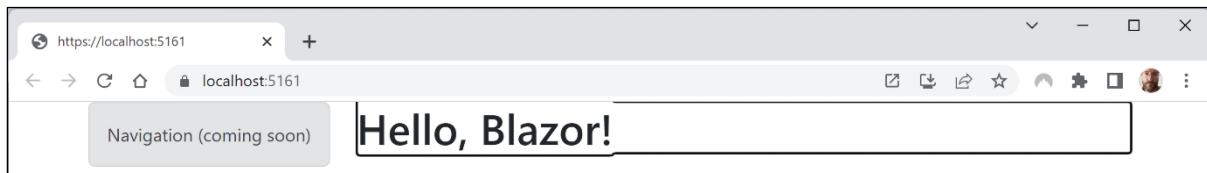
Speedy Gonzales

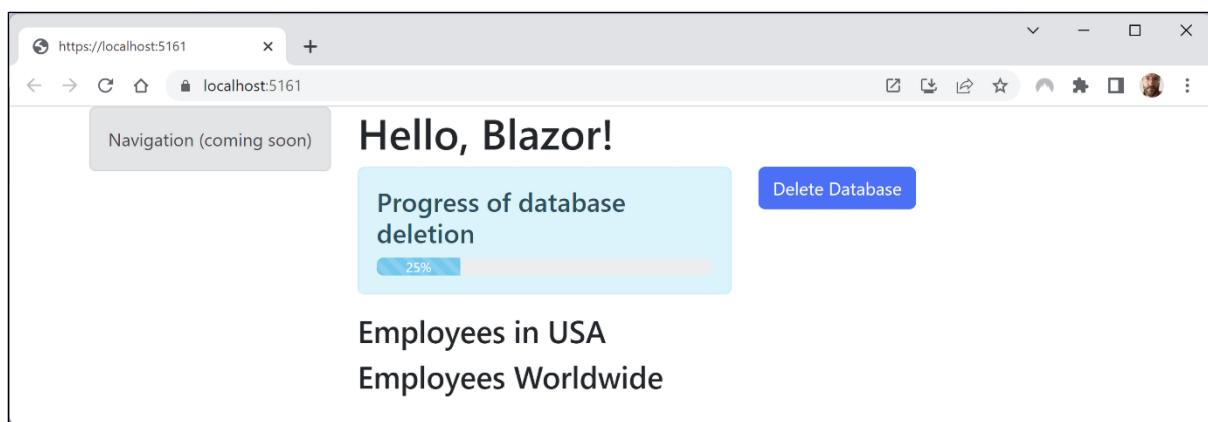
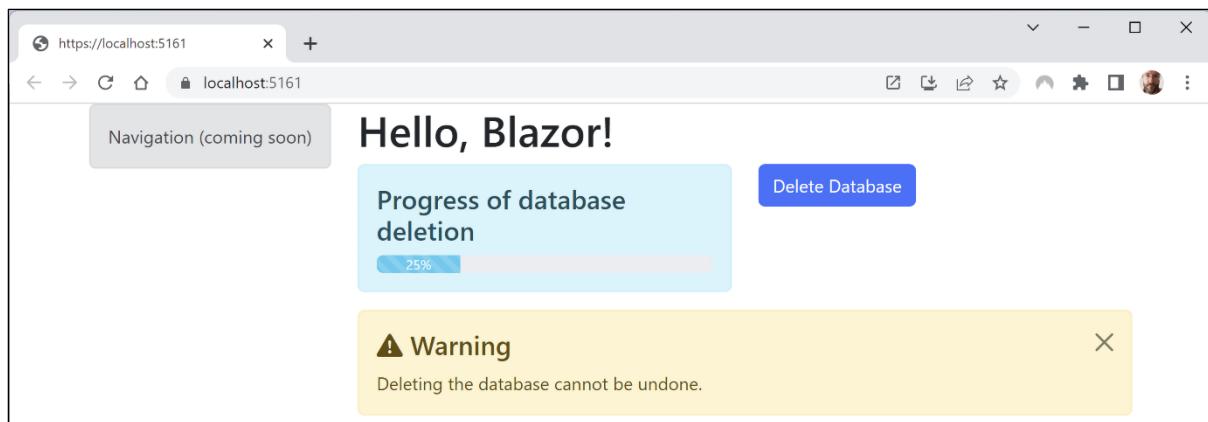
(503) 555-9831

Submit

A screenshot of a Microsoft Edge browser window. The address bar shows the URL "localhost:5151/Home/ProcessShipper". Below the address bar, the page content displays a JSON object: {"shipperId":99,"companyName":"Speedy Gonzales","phone": "(503) 555-9831", "orders":[]}. The browser interface includes standard navigation buttons (back, forward, search), a refresh button, and a star icon for bookmarks.

# Chapter 16: Building Web Components Using Blazor WebAssembly





EmployeeId	FirstName	LastName	City	Country	BirthDate	HireDate
1	Nancy	Davolio	Seattle	USA	1948-12-08	1992-05-01
2	Andrew	Fuller	Tacoma	USA	1952-02-19	1992-08-14
3	Janet	Leverling	Kirkland	USA	1963-08-30	1992-04-01
4	Margaret	Peacock	Redmond	USA	1937-09-19	1993-05-03
8	Laura	Callahan	Seattle	USA	1958-01-09	1994-03-05

https://localhost:5161/employees

localhost:5161/employees

### Employees Worldwide

EmployeeId	FirstName	LastName	City	Country	BirthDate	HireDate
4	Margaret	Peacock	Redmond	USA	1937-09-19	1993-05-03
1	Nancy	Davolio	Seattle	USA	1948-12-08	1992-05-01
2	Andrew	Fuller	Tacoma	USA	1952-02-19	1992-08-14
5	Steven	Buchanan	London	UK	1955-03-04	1993-10-17
8	Laura	Callahan	Seattle	USA	1958-01-09	1994-03-05
7	Robert	King	London	UK	1960-05-29	1994-01-02
6	Michael	Suyama	London	UK	1963-07-02	1993-10-17
3	Janet	Leverling	Kirkland	USA	1963-08-30	1992-04-01
9	Anne	Dodsworth	London	UK	1966-01-27	1994-11-15

https://localhost:5161/employees

localhost:5161/employees/USA

### Employees in USA

EmployeeId	FirstName	LastName	City	Country	BirthDate	HireDate
1	Nancy	Davolio	Seattle	USA	1948-12-08	1992-05-01
2	Andrew	Fuller	Tacoma	USA	1952-02-19	1992-08-14
3	Janet	Leverling	Kirkland	USA	1963-08-30	1992-04-01
4	Margaret	Peacock	Redmond	USA	1937-09-19	1993-05-03
8	Laura	Callahan	Seattle	USA	1958-01-09	1994-03-05

Network

Preserve log | Disable cache | No throttling | Filter | Invert | Hide data URLs | All | Fetch/XHR | JS | CSS | Img | Media | Font | Doc | WS | Wasm | Manifest | Other | Has blocked cookies | Blocked Requests | 3rd-party requests

Name	Status	Type	Initiator	Size	Time	Waterfall
LocalStorageInterop.js	200	script	blazor.webassembly.js:1	448 B	9 ms	
QuickGrid.razor.js	200	script	blazor.webassembly.js:1	(disk cache)	1 ms	
employees	200	fetch	dotnet.7.0.0-preview.6.22324.4...	268 kB	1.64 s	

3 requests | 268 kB transferred | 290 kB resources

Screenshot of a browser window showing the "Employees in USA" page of a Blazor application. The page displays a table of employee data and includes navigation links for "Home", "Employees Worldwide", "Employees in USA", and "Employees in UK".

EmployeeId	FirstName	LastName	City	Country	BirthDate	HireDate
1	Nancy	Davolio	Seattle	USA	1948-12-08	1992-05-01
2	Andrew	Fuller	Tacoma	USA	1952-02-19	1992-08-14
3	Janet	Leverling	Kirkland	USA	1963-08-30	1992-04-01
4	Margaret	Peacock	Redmond	USA	1937-09-19	1993-05-03
8	Laura	Callahan	Seattle	USA	1958-01-09	1994-03-05

The browser's developer tools Application tab shows the following storage state:

- Key:** employeesArray  
**Value:** [{"\$id": "1", "EmployeeId": 1, "LastName": "Davolio", "FirstName": "Nancy", "Title": "Sales Representative", ...}, {"\$id": "2", "EmployeeId": 1, "LastName": "Davolio", "FirstName": "Nancy", "Title": "Sales Representative", ...}, {"\$id": "3", "EmployeeId": 2, "LastName": "Fuller", "FirstName": "Andrew", "Title": "Vice President, Sales", ...}, {"\$id": "4", "EmployeeId": 2, "LastName": "Fuller", "FirstName": "Andrew", "Title": "Vice President, Sales", ...}, {"\$id": "5", "EmployeeId": 3, "LastName": "Leverling", "FirstName": "Janet", "Title": "Sales Representative", ...}, {"\$id": "6", "EmployeeId": 3, "LastName": "Leverling", "FirstName": "Janet", "Title": "Sales Representative", ...}, {"\$id": "7", "EmployeeId": 4, "LastName": "Peacock", "FirstName": "Margaret", "Title": "Sales Representative", ...}, {"\$id": "8", "EmployeeId": 4, "LastName": "Peacock", "FirstName": "Margaret", "Title": "Sales Representative", ...}, {"\$id": "9", "EmployeeId": 5, "LastName": "Buchanan", "FirstName": "Steven", "Title": "Sales Manager", ...}, {"\$id": "10", "EmployeeId": 5, "LastName": "Buchanan", "FirstName": "Steven", "Title": "Sales Manager", ...}, {"\$id": "11", "EmployeeId": 6, "LastName": "Suyama", "FirstName": "Michael", "Title": "Sales Representative", ...}, {"\$id": "12", "EmployeeId": 6, "LastName": "Suyama", "FirstName": "Michael", "Title": "Sales Representative", ...}, {"\$id": "13", "EmployeeId": 7, "LastName": "King", "FirstName": "Robert", "Title": "Sales Representative", ...}, {"\$id": "14", "EmployeeId": 7, "LastName": "King", "FirstName": "Robert", "Title": "Sales Representative", ...}, {"\$id": "15", "EmployeeId": 8, "LastName": "Callahan", "FirstName": "Laura", "Title": "Inside Sales Coordinator", ...}, {"\$id": "16", "EmployeeId": 8, "LastName": "Callahan", "FirstName": "Laura", "Title": "Inside Sales Coordinator", ...}, {"\$id": "17", "EmployeeId": 9, "LastName": "Dodsworth", "FirstName": "Anne", "Title": "Sales Representative", ...}, {"\$id": "18", "EmployeeId": 9, "LastName": "Dodsworth", "FirstName": "Anne", "Title": "Sales Representative", ...}]
- Key:** i18nextLng  
**Value:** en-US
- Key:** employeesLastGet  
**Value:** 8/8/2022 2:54:59 PM

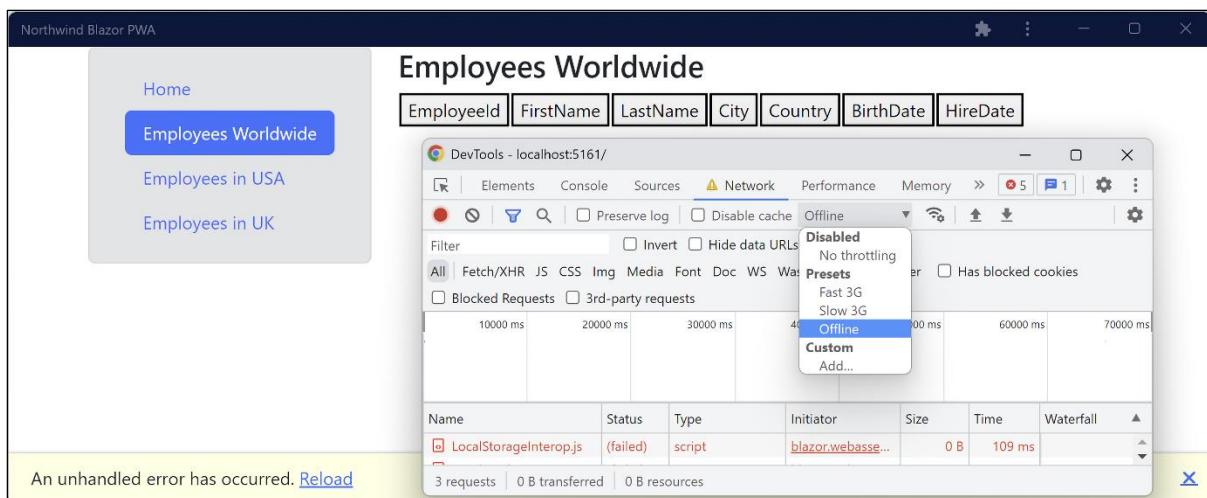
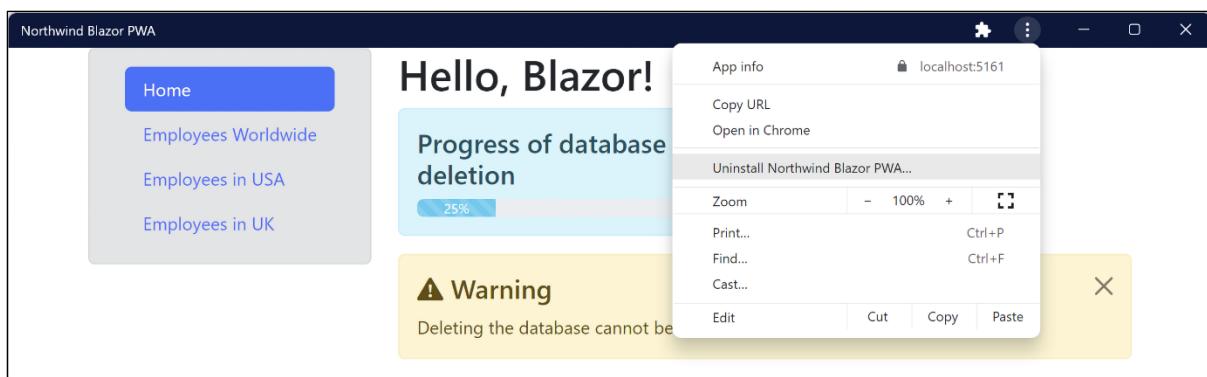
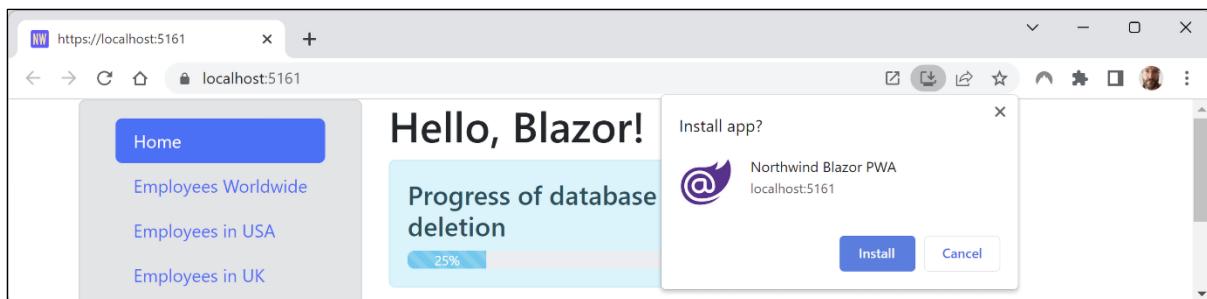
Screenshot of a browser window showing the "Employees in USA" page of a Blazor application. The page displays a table of employee data and includes navigation links for "Home", "Employees Worldwide", "Employees in USA", and "Employees in UK".

EmployeeId	FirstName	LastName	City	Country	BirthDate	HireDate
8	Laura	Callahan	Seattle	USA	1958-01-09	1994-03-05
1	Nancy	Davolio	Seattle	USA	1948-12-08	1992-05-01
2	Andrew	Fuller	Tacoma	USA	1952-02-19	1992-08-14
3	Janet	Leverling	Kirkland	USA	1963-08-30	1992-04-01
4	Margaret	Peacock	Redmond	USA	1937-09-19	1993-05-03

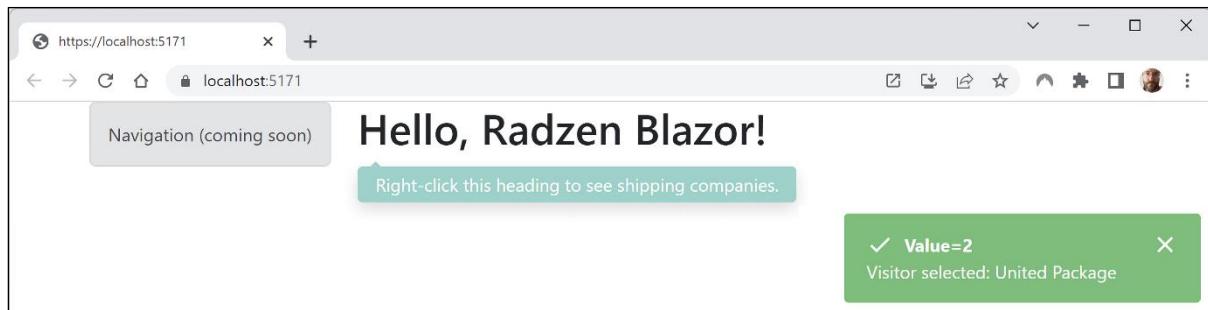
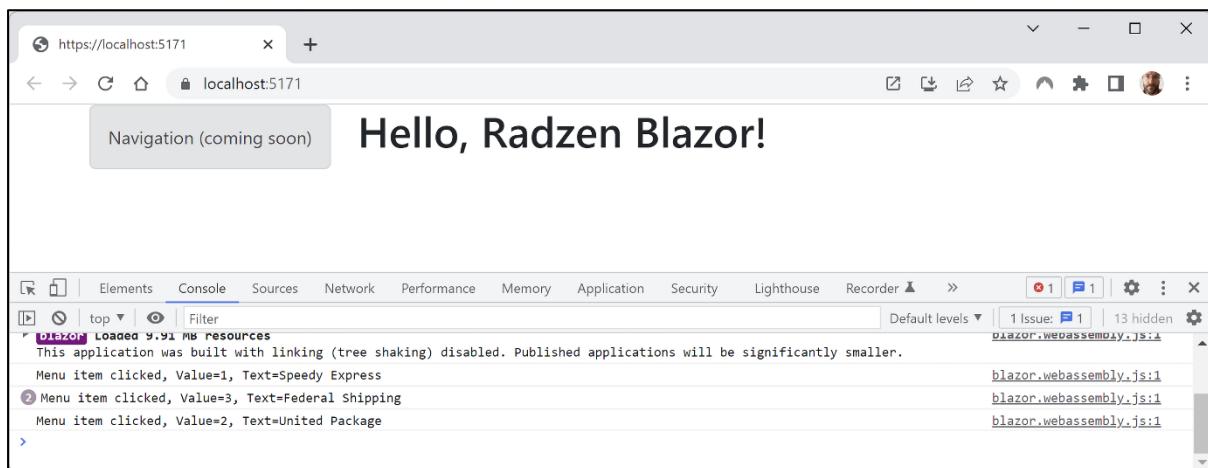
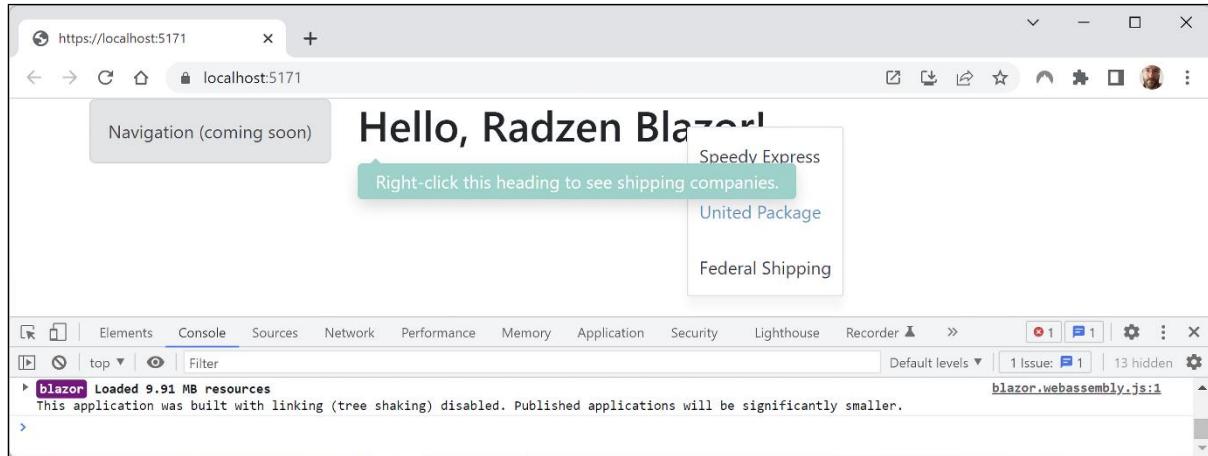
The browser's developer tools Application tab shows the following storage state:

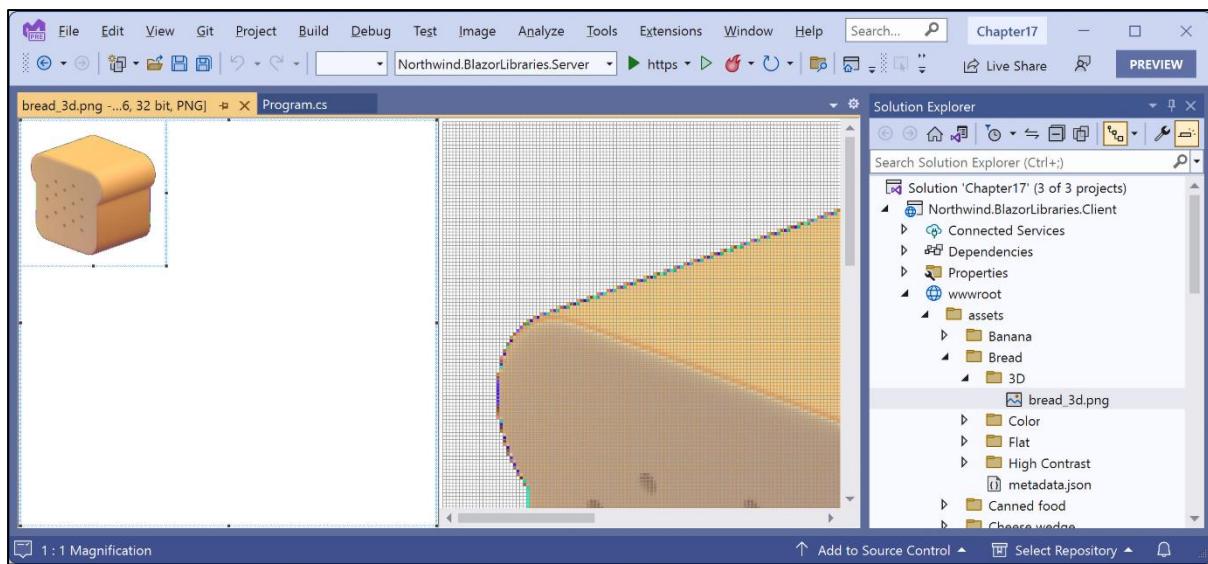
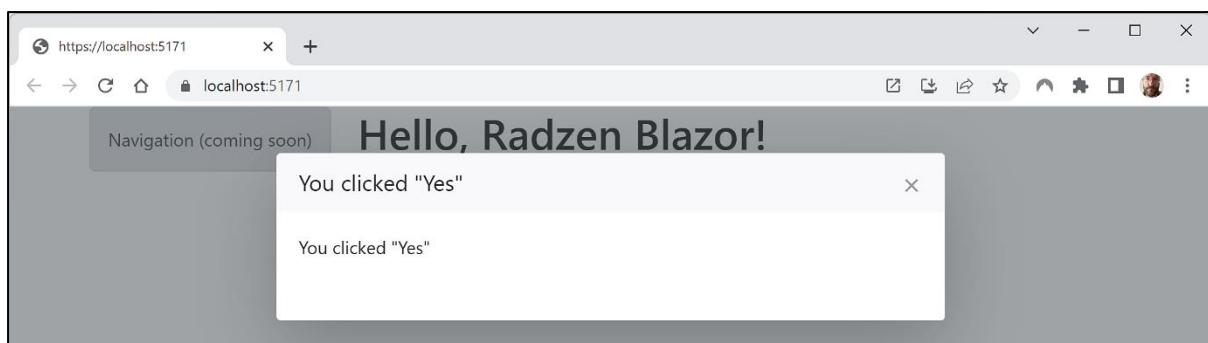
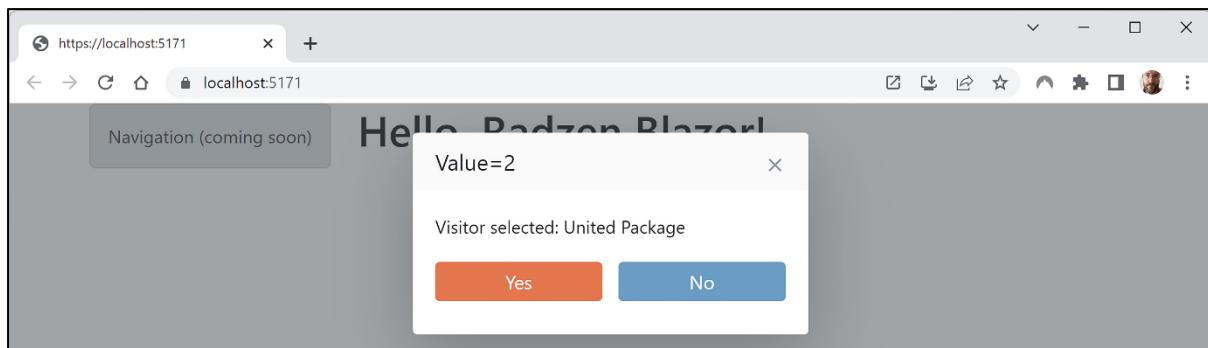
- Key:** employeesArray  
**Value:** [{"\$id": "1", "EmployeeId": 1, "LastName": "Davolio", "FirstName": "Nancy", "Title": "Sales Representative", ...}, {"\$id": "2", "EmployeeId": 1, "LastName": "Davolio", "FirstName": "Nancy", "Title": "Sales Representative", ...}, {"\$id": "3", "EmployeeId": 2, "LastName": "Fuller", "FirstName": "Andrew", "Title": "Vice President, Sales", ...}, {"\$id": "4", "EmployeeId": 2, "LastName": "Fuller", "FirstName": "Andrew", "Title": "Vice President, Sales", ...}, {"\$id": "5", "EmployeeId": 3, "LastName": "Leverling", "FirstName": "Janet", "Title": "Sales Representative", ...}, {"\$id": "6", "EmployeeId": 3, "LastName": "Leverling", "FirstName": "Janet", "Title": "Sales Representative", ...}, {"\$id": "7", "EmployeeId": 4, "LastName": "Peacock", "FirstName": "Margaret", "Title": "Sales Representative", ...}, {"\$id": "8", "EmployeeId": 4, "LastName": "Peacock", "FirstName": "Margaret", "Title": "Sales Representative", ...}, {"\$id": "9", "EmployeeId": 5, "LastName": "Buchanan", "FirstName": "Steven", "Title": "Sales Manager", ...}, {"\$id": "10", "EmployeeId": 5, "LastName": "Buchanan", "FirstName": "Steven", "Title": "Sales Manager", ...}, {"\$id": "11", "EmployeeId": 6, "LastName": "Suyama", "FirstName": "Michael", "Title": "Sales Representative", ...}, {"\$id": "12", "EmployeeId": 6, "LastName": "Suyama", "FirstName": "Michael", "Title": "Sales Representative", ...}, {"\$id": "13", "EmployeeId": 7, "LastName": "King", "FirstName": "Robert", "Title": "Sales Representative", ...}, {"\$id": "14", "EmployeeId": 7, "LastName": "King", "FirstName": "Robert", "Title": "Sales Representative", ...}, {"\$id": "15", "EmployeeId": 8, "LastName": "Callahan", "FirstName": "Laura", "Title": "Inside Sales Coordinator", ...}, {"\$id": "16", "EmployeeId": 8, "LastName": "Callahan", "FirstName": "Laura", "Title": "Inside Sales Coordinator", ...}, {"\$id": "17", "EmployeeId": 9, "LastName": "Dodsworth", "FirstName": "Anne", "Title": "Sales Representative", ...}, {"\$id": "18", "EmployeeId": 9, "LastName": "Dodsworth", "FirstName": "Anne", "Title": "Sales Representative", ...}]
- Key:** i18nextLng  
**Value:** en-US
- Key:** employeesLastGet  
**Value:** 8/8/2022 3:07:38 PM

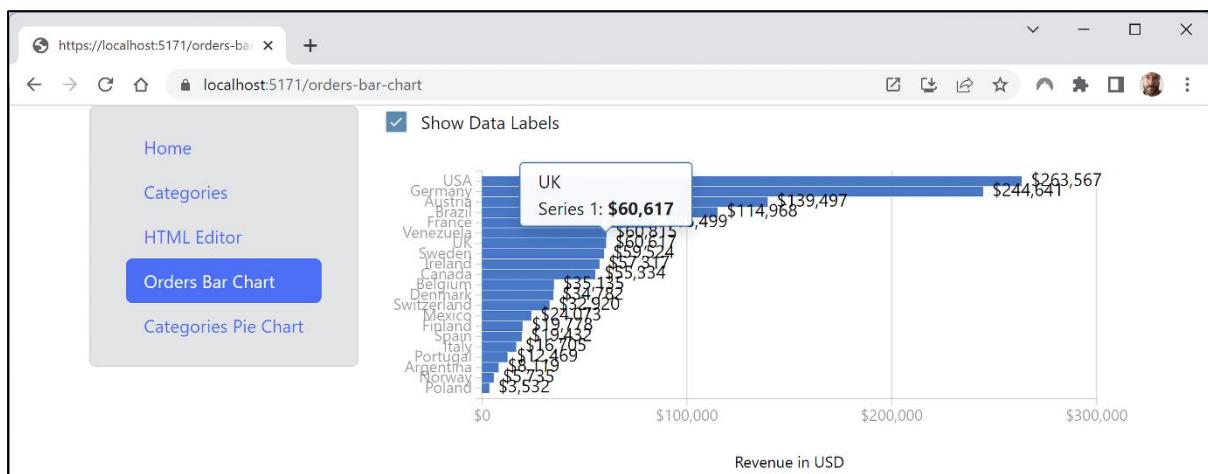
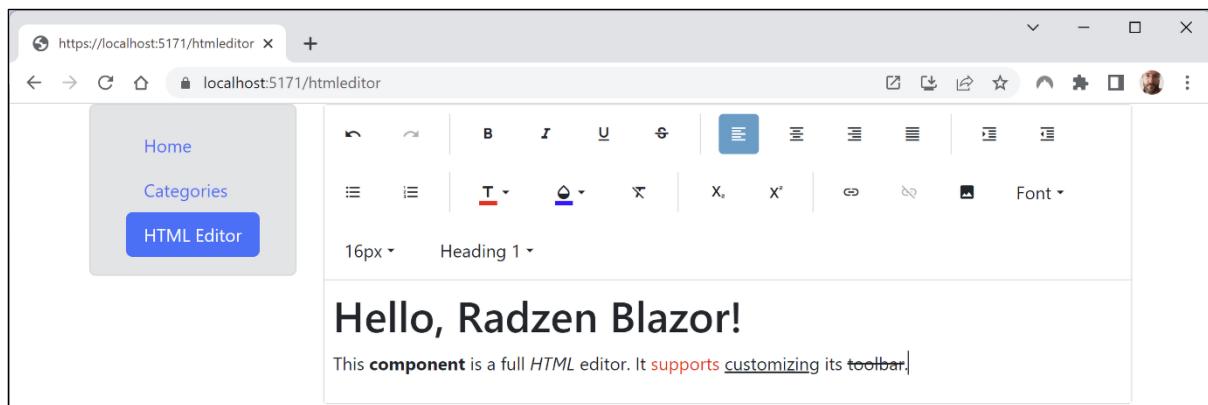
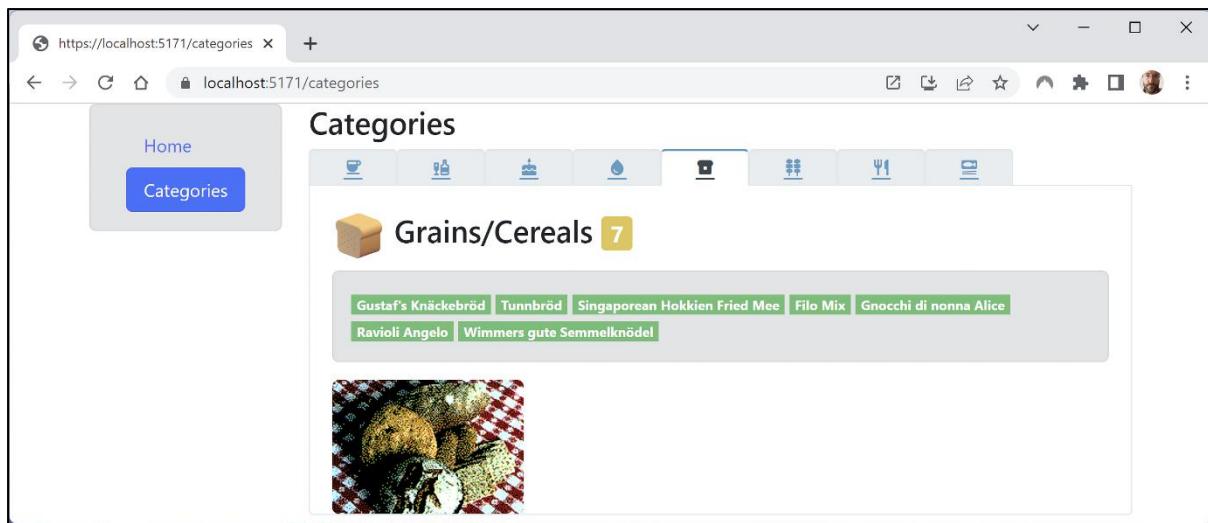
Screenshot of a browser window showing the "Hello, Blazor!" page of a Blazor application. The page displays a "Hello, Blazor!" message and includes navigation links for "Home", "Employees Worldwide", and "Employees in USA". It also features a "Progress of database" bar and a "Delete Database" button.

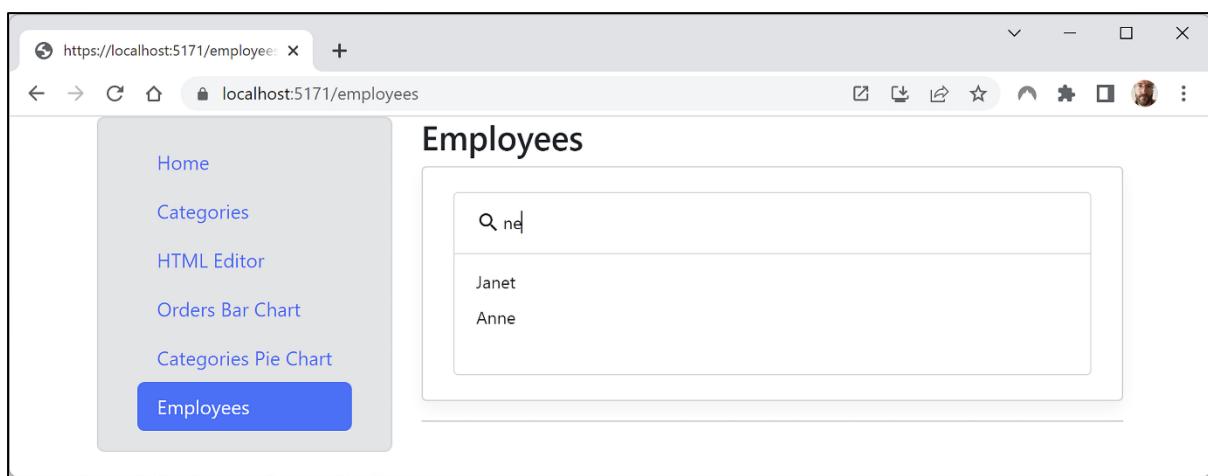
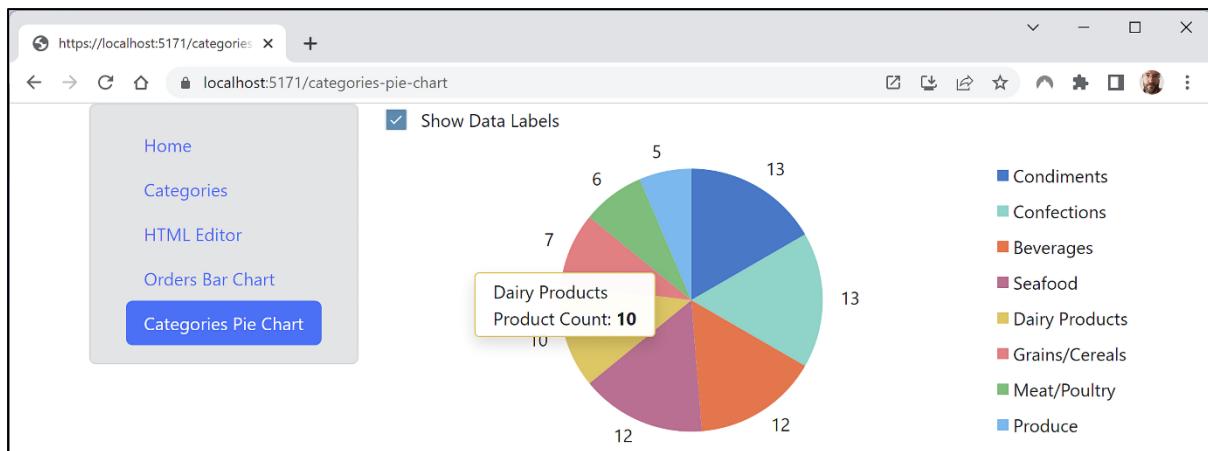


# Chapter 17: Leveraging Open-Source Blazor Component Libraries









Home

Categories

HTML Editor

Orders Bar Chart

Categories Pie Chart

**Employees**

## Employees

- Janet
- Anne

**Employee Details**

Employee ID	3
Title	Sales Representative
Title of Courtesy	Ms.
First Name	Janet
Last Name	Leverling
Birth Date	8/30/1963 12:00:00 AM
Hire Date	4/1/1992 12:00:00 AM

Janet has a BS degree in chemistry from Boston College (1984). She has also completed a certificate program in food retailing management. Janet was hired as a sales associate in 1991 and promoted to sales representative in February 1992.

**Home Address**

Country	USA
City	Kirkland
Region	WA
Postal Code	98033
Building/Street	722 Moss Bay Blvd.
Home Phone	(206) 555-3412

Picture



Save Changes

https://localhost:5171/employees

Home

Categories

HTML Editor

Orders Bar Chart

Categories Pie Chart

**Employees**

## Employees

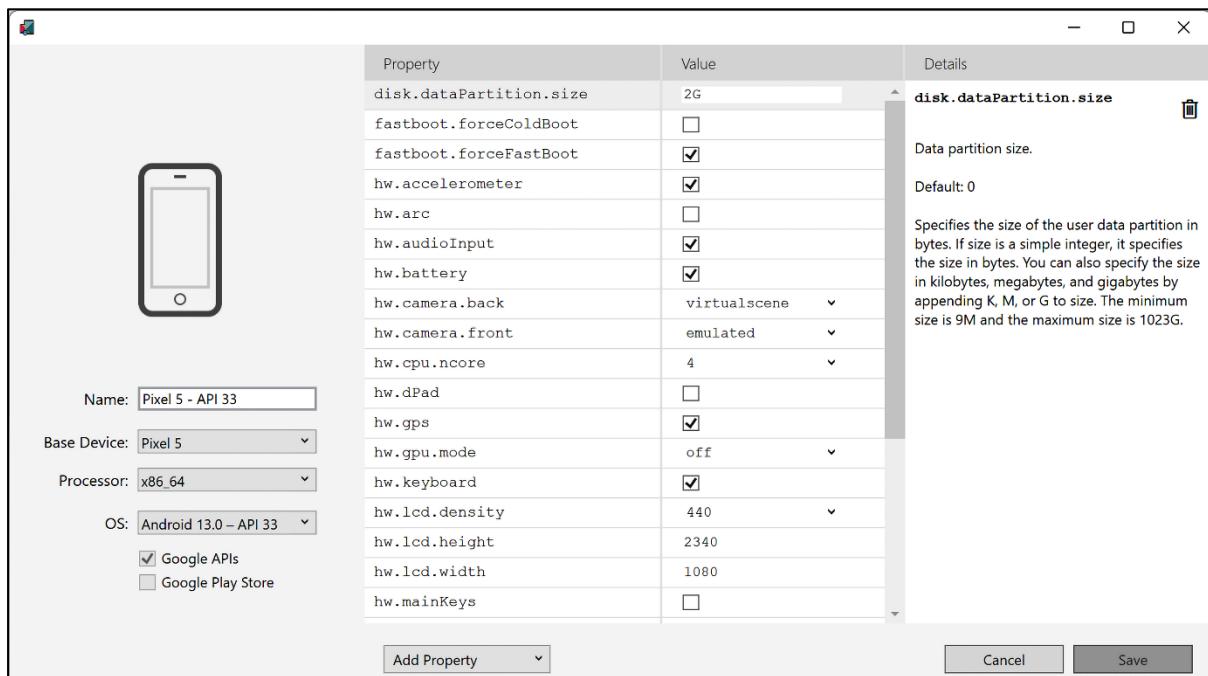
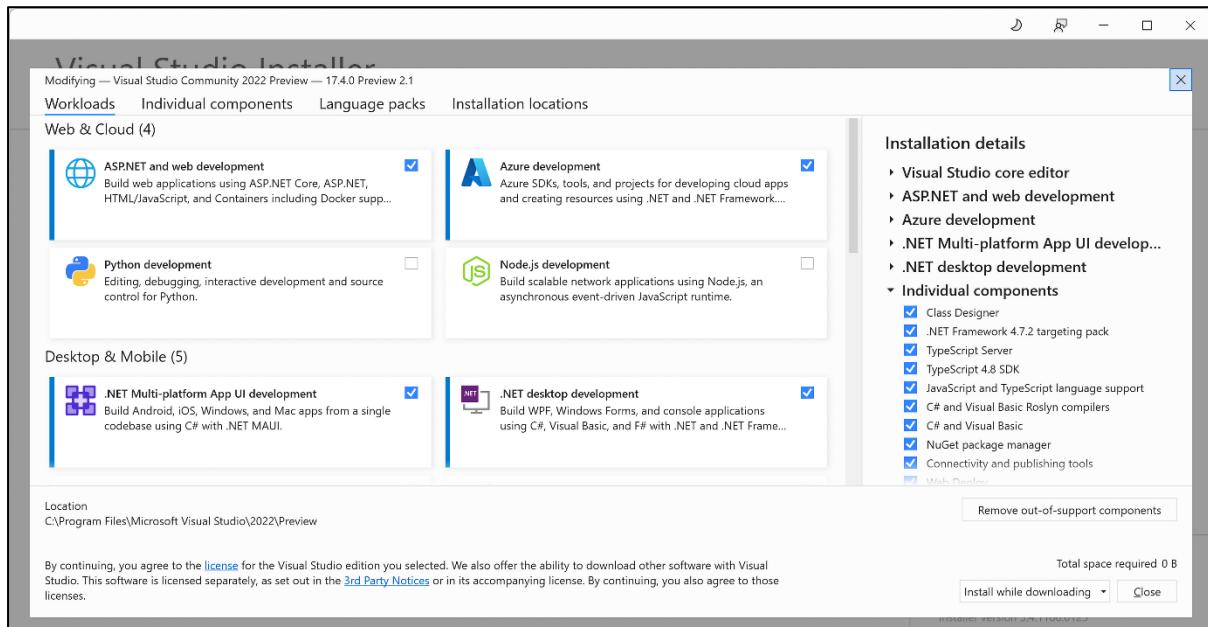
- Janet
- Anne

✓ OK Employees affected: 1

Employee Details

Home Address

# Chapter 18: Building Mobile and Desktop Apps Using .NET MAUI



Name	OS	Processor	Memory	Resolution	Action
Pixel 5 – API 33 + Google APIs	Android 13.0 – API 33	x86_64	1 GB	1080 x 2340 440 dpi	 Start
Pixel 4a – API 30 + Google APIs	Android 11.0 – API 30	x86	1 GB	1080 x 2340 440 dpi	

← Settings

 Mark Price  
markjprice@msn.com

## Privacy & security > For developers

These settings are intended for development use only.

Find a setting 

Learn more

 System

 Bluetooth & devices

 Network & internet

### Developer Mode

Install apps from any source, including loose files.

 On

Create a new project

Recent project templates

A list of your recently accessed templates will be displayed here.

Search for templates (Alt+S)  Clear all

C# All platforms MAUI

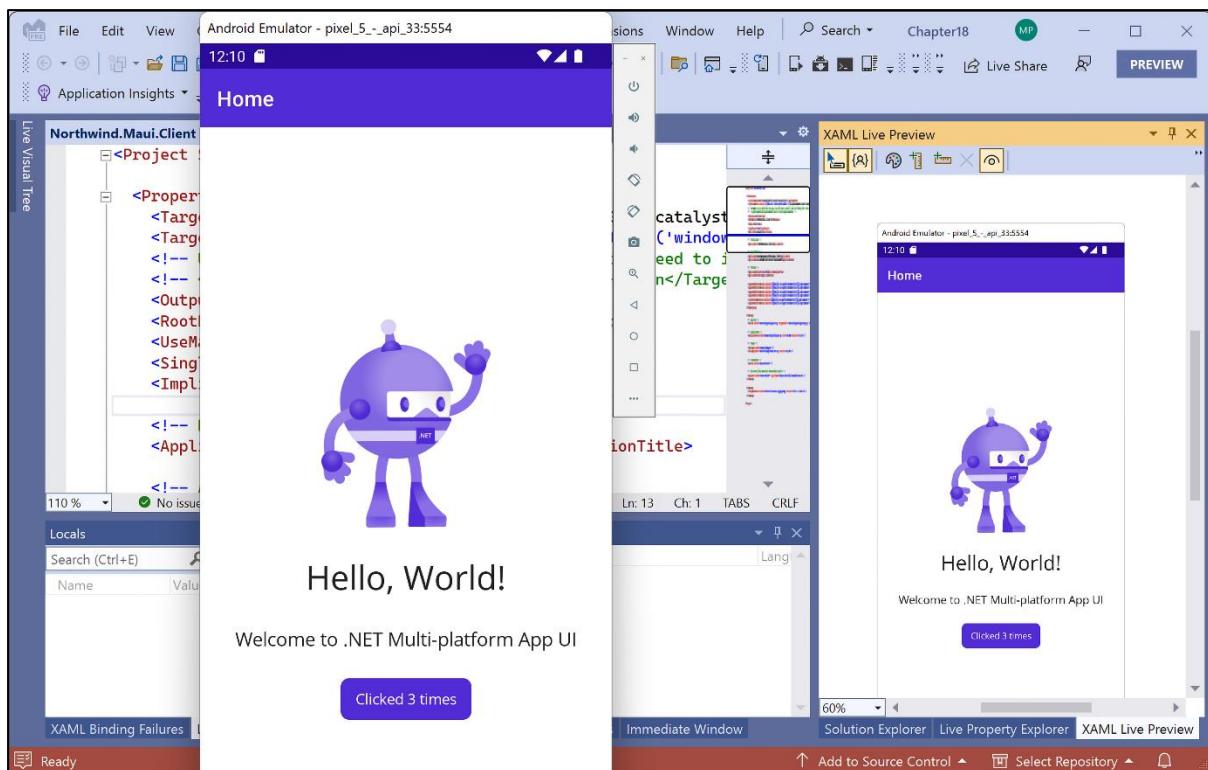
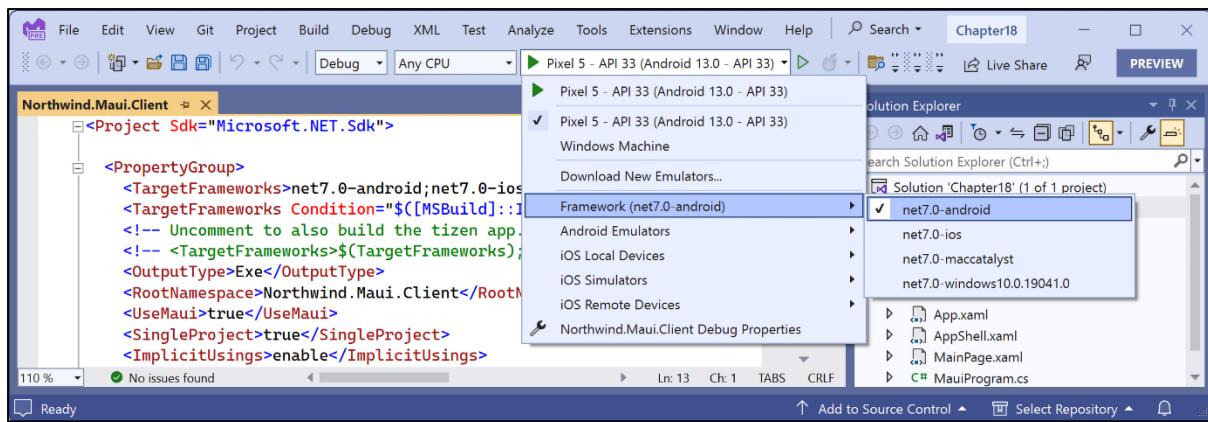
 .NET MAUI App  A project for creating a .NET MAUI application for iOS, Android, Mac Catalyst, WinUI and Tizen  
C# Android iOS Mac Catalyst macOS MAUI Tizen Windows

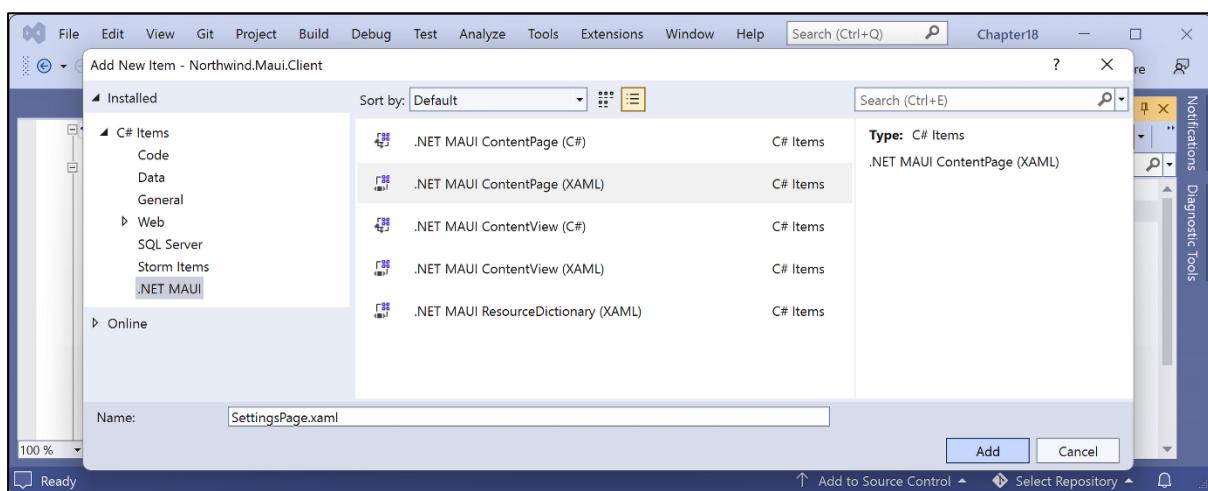
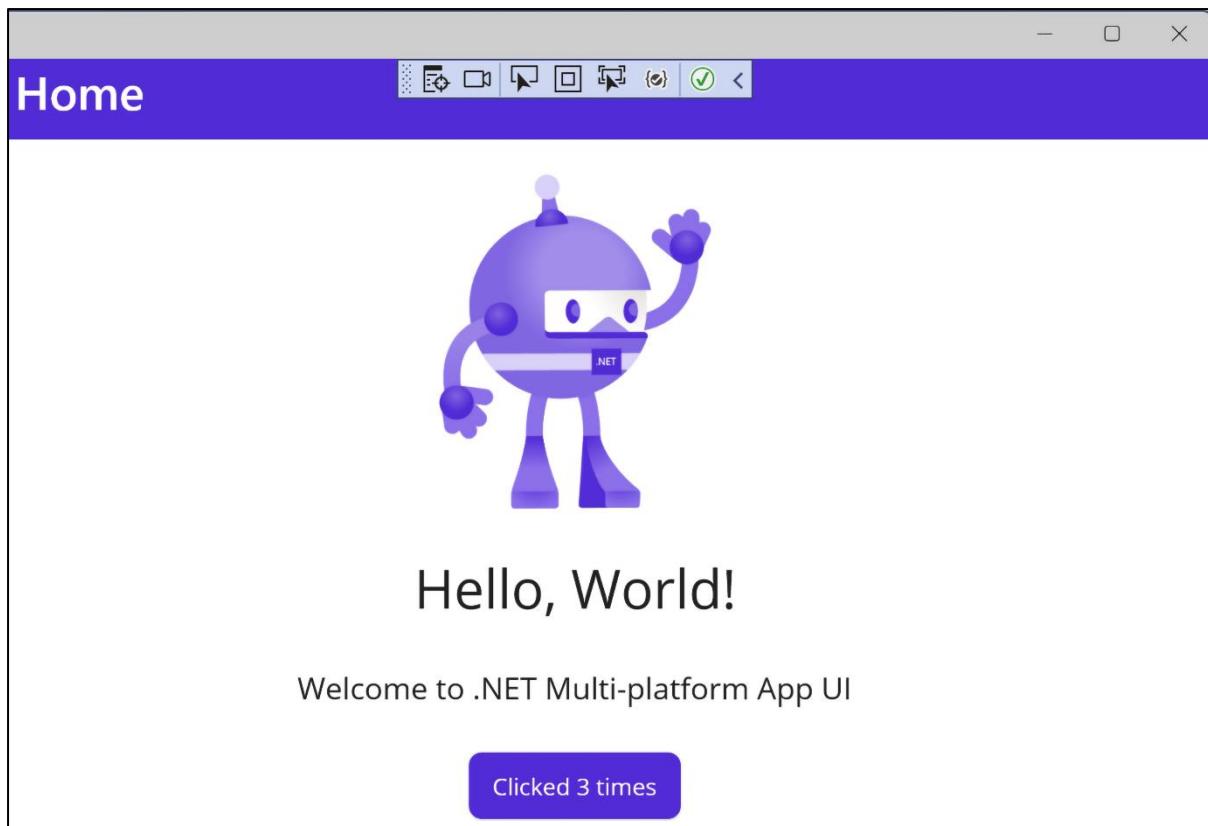
 .NET MAUI Blazor App  A project for creating a .NET MAUI application for iOS, Android, Mac Catalyst, WinUI, and Tizen using Blazor  
C# Android Blazor iOS Mac Catalyst macOS MAUI Tizen Windows

 .NET MAUI Class Library  A project for creating a .NET MAUI class library  
C# Android iOS Mac Catalyst macOS MAUI Tizen Windows

Not finding what you're looking for?

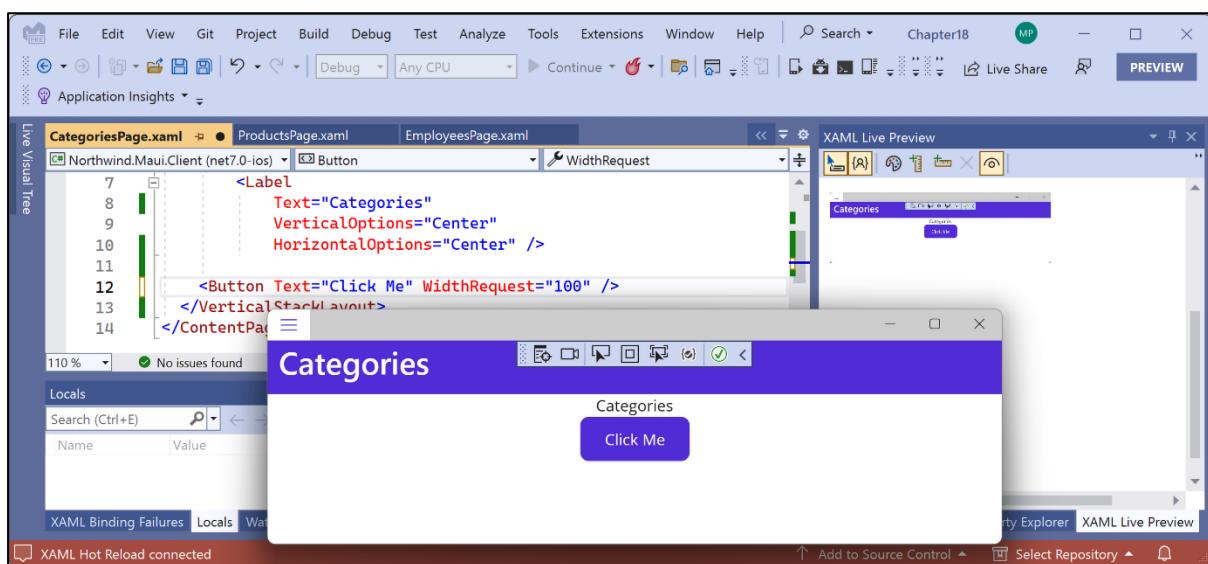
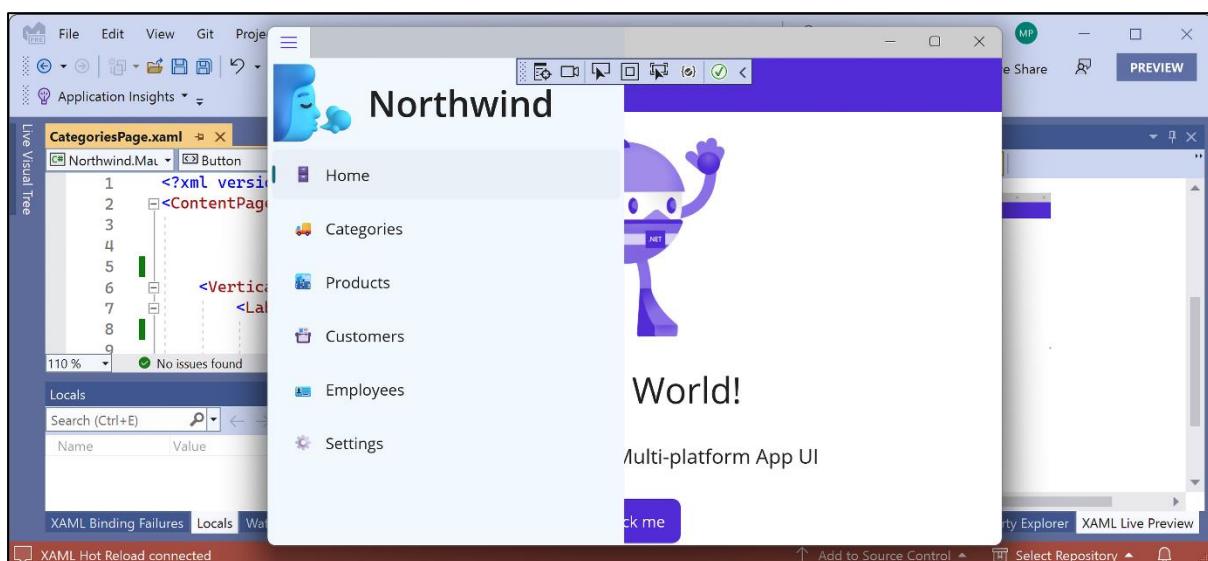
 Back  Next



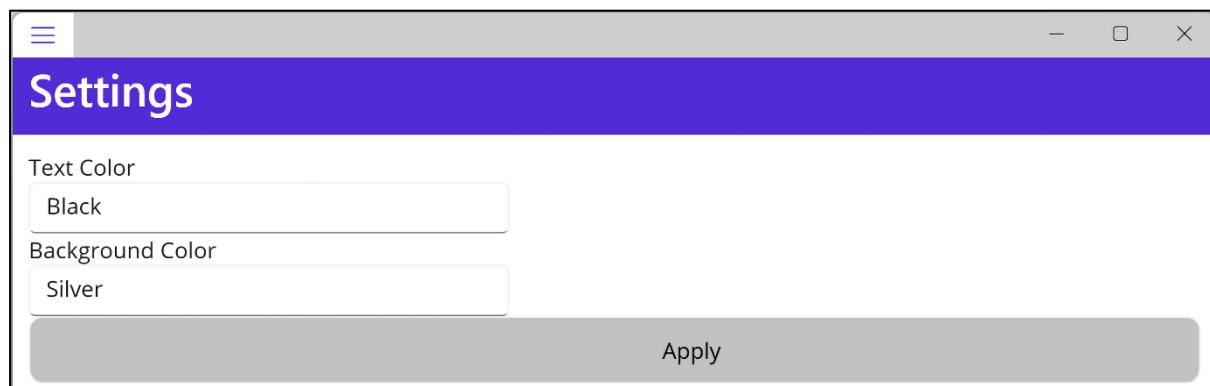
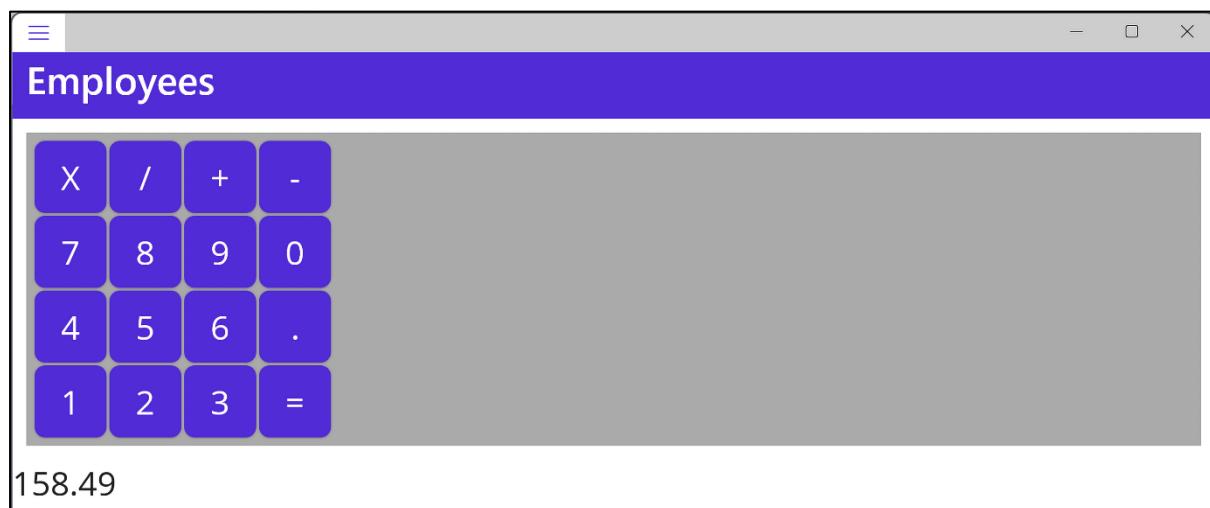


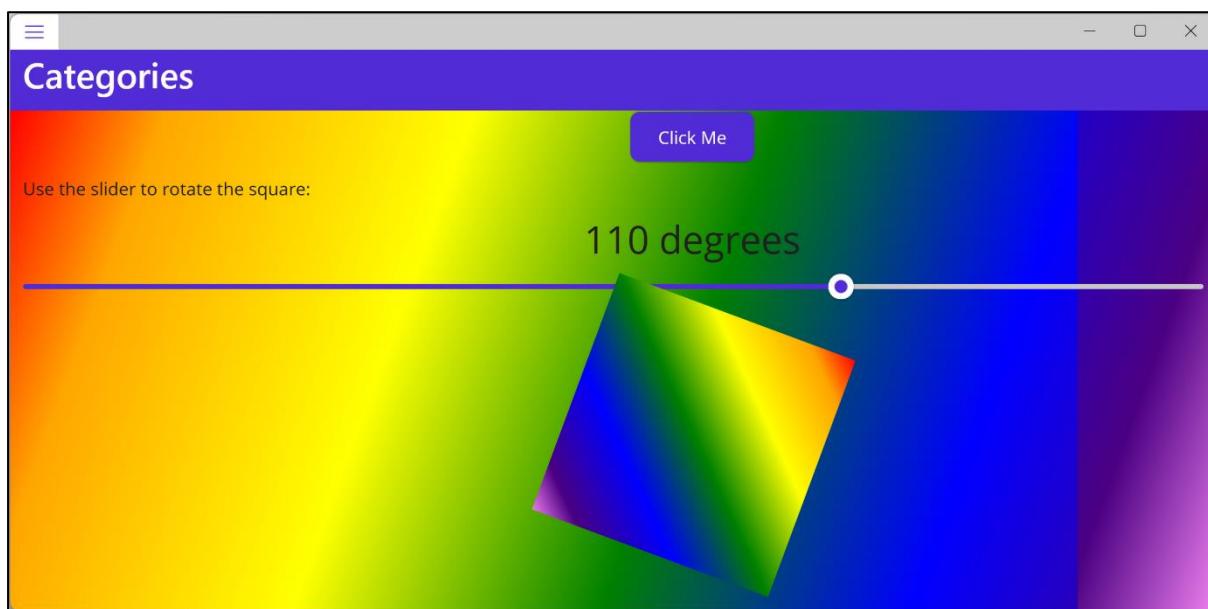
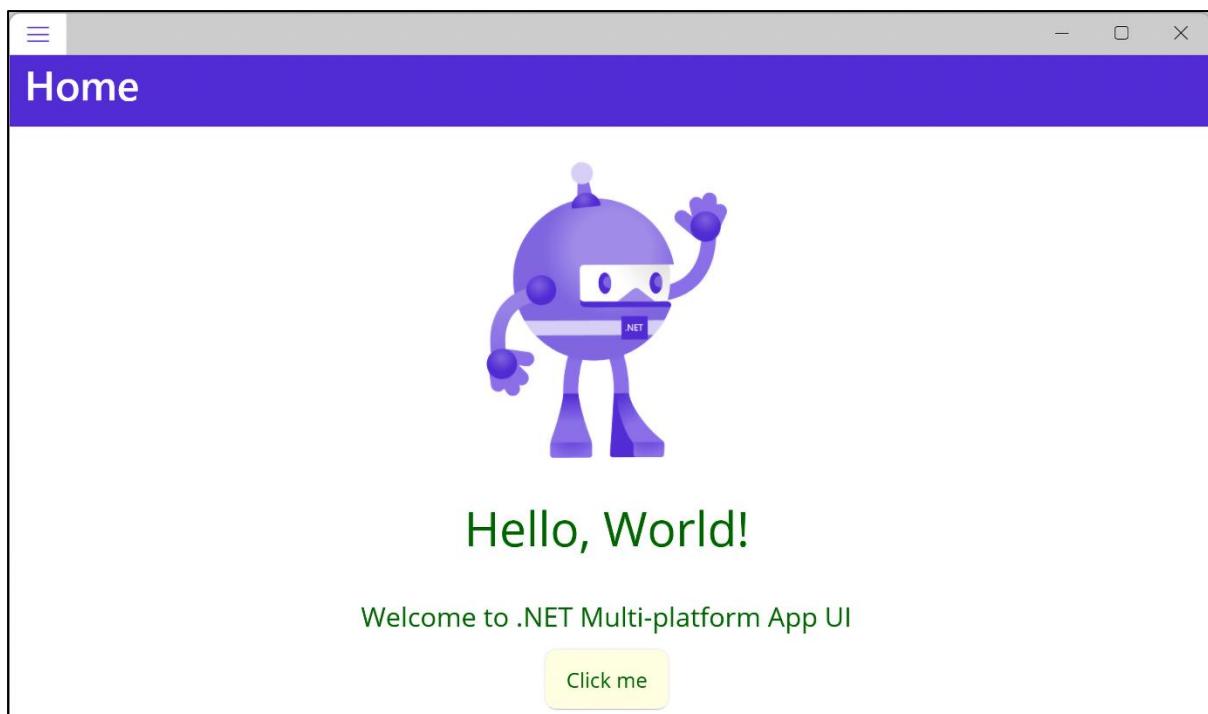
The screenshot shows the Visual Studio IDE interface. The title bar says "Chapter18". The main area displays the XAML code for "CategoriesPage.xaml". The code defines a ContentPage with a VerticalStackLayout containing a Label with the text "Categories".

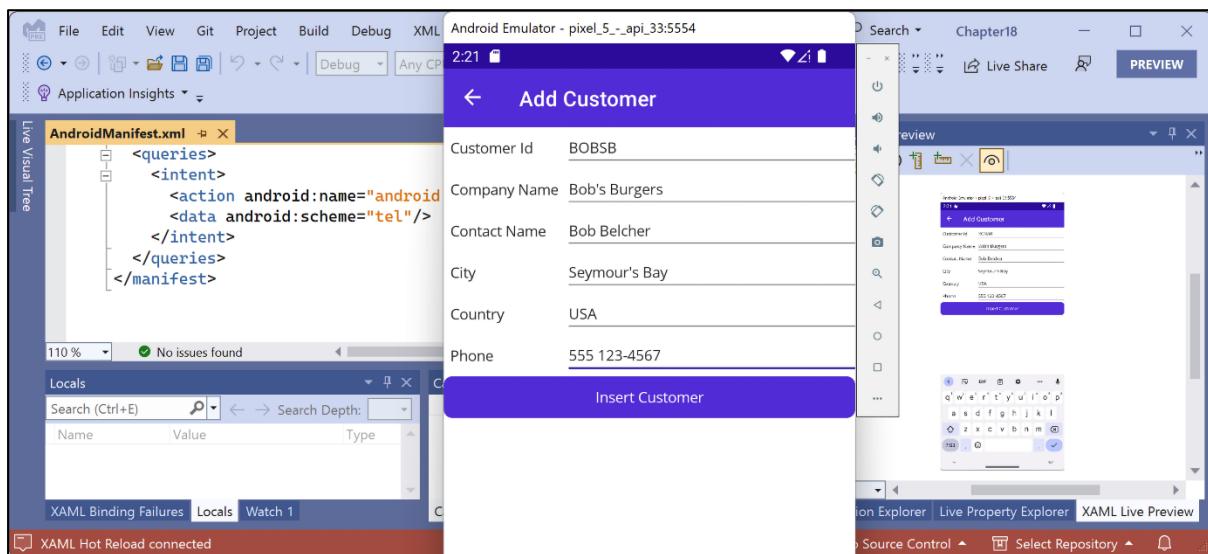
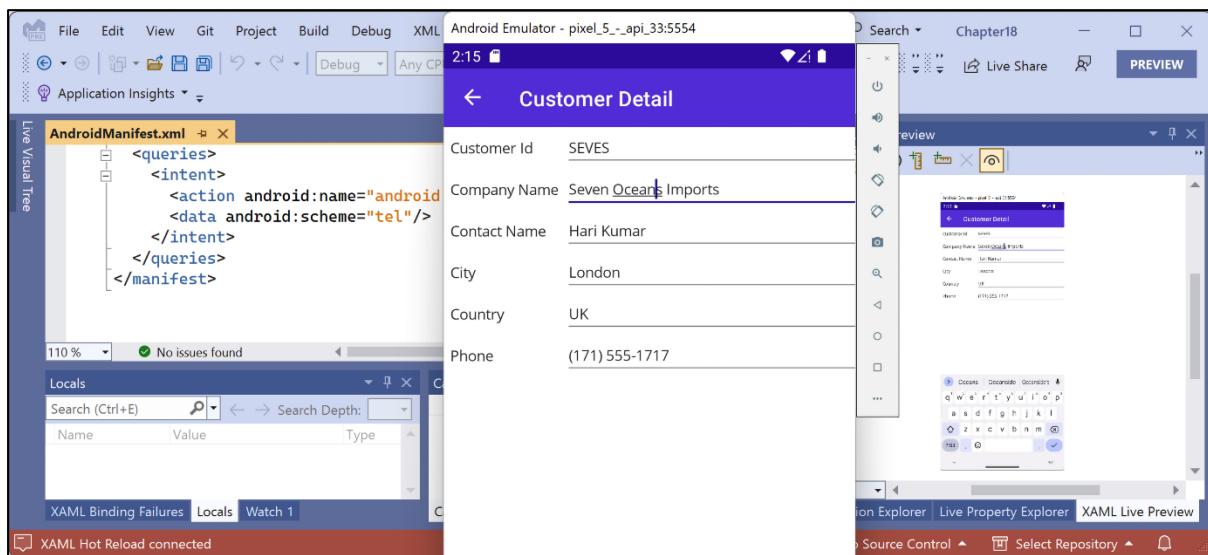
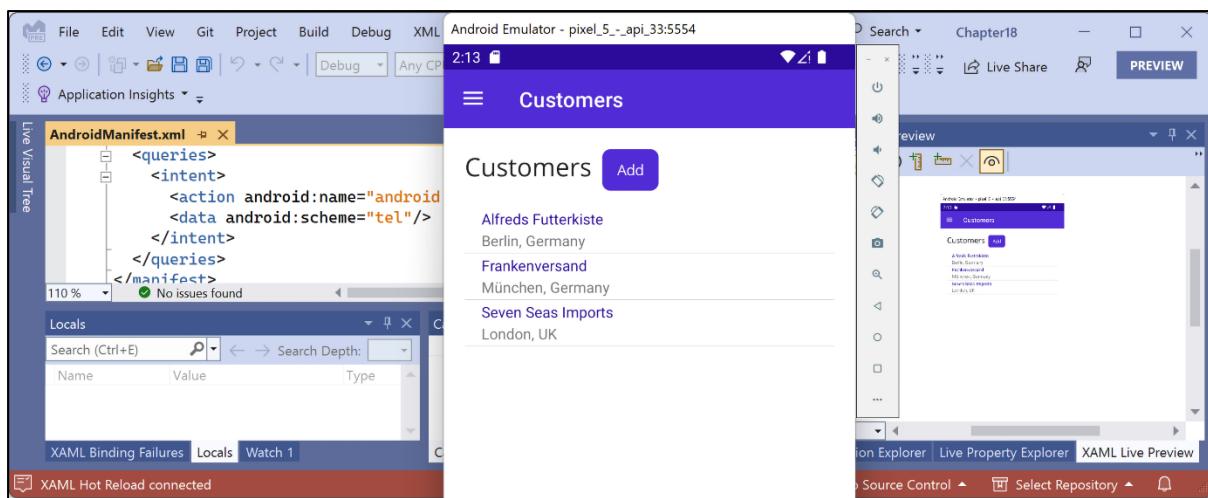
```
<?xml version="1.0" encoding="utf-8" ?>
<ContentPage xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
    xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
    x:Class="Northwind.Mau.Client.CategoriesPage"
    Title="Categories">
    <VerticalStackLayout>
        <Label
            Text="Categories"
            VerticalOptions="Center"
            HorizontalOptions="Center" />
    </VerticalStackLayout>
</ContentPage>
```

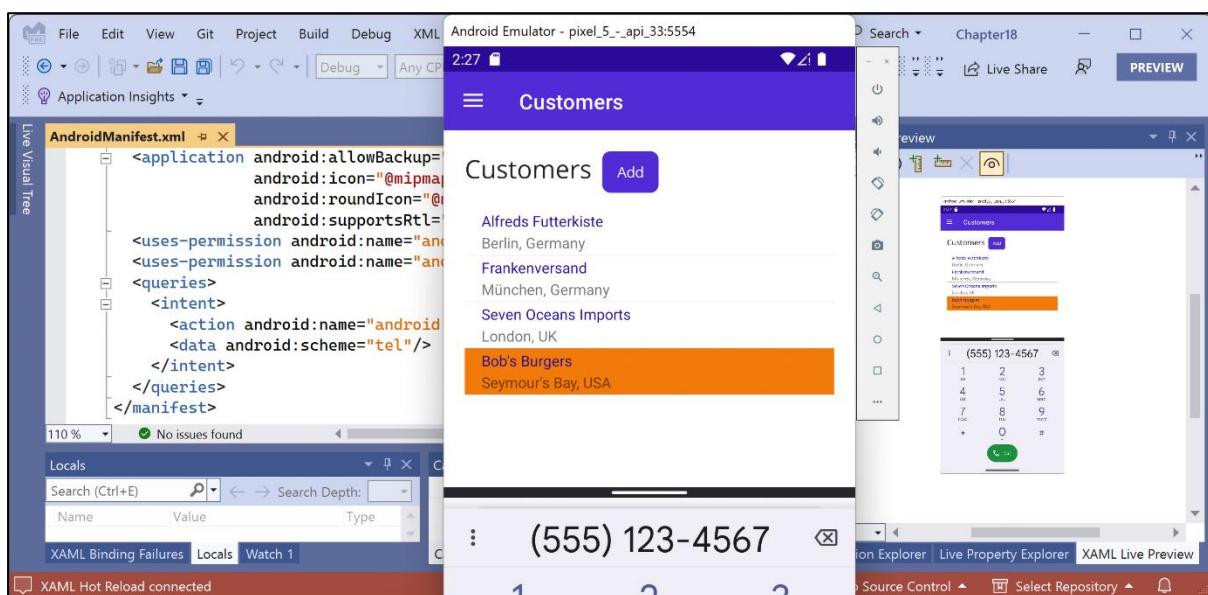
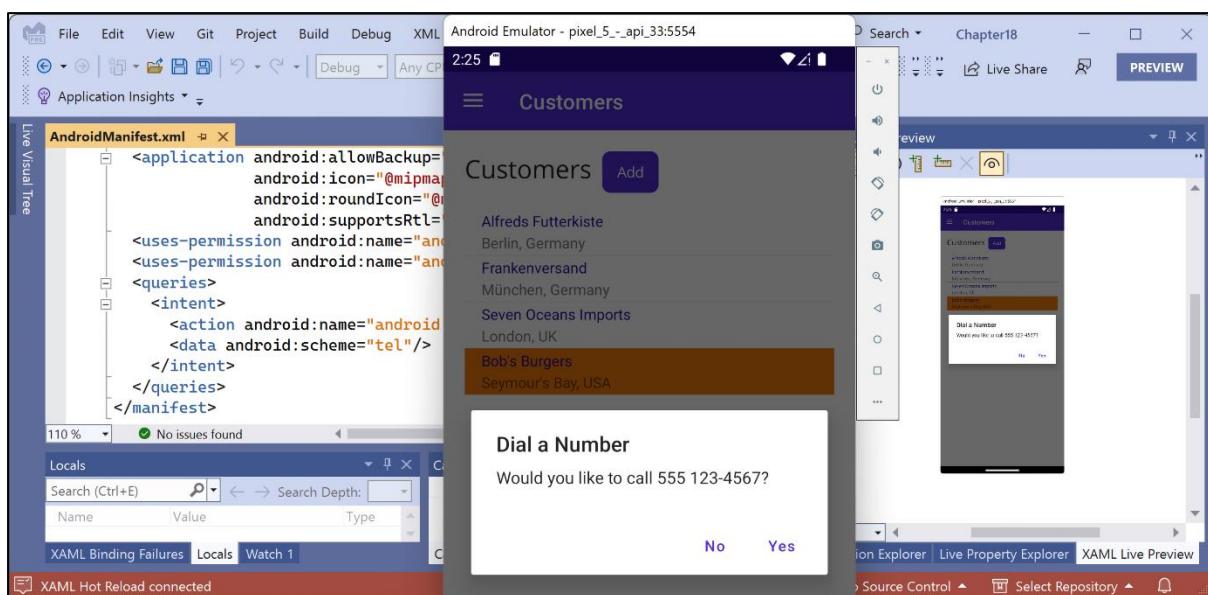
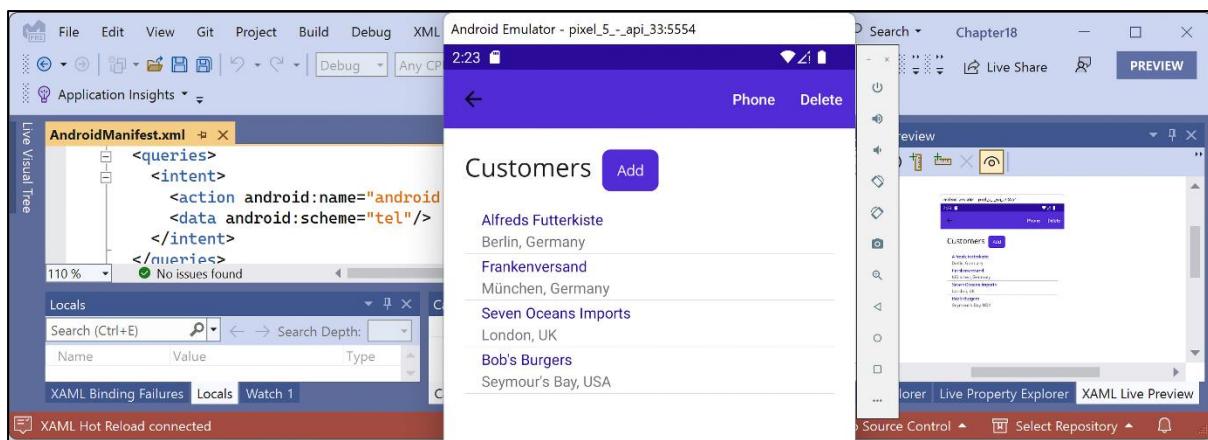


```
<?xml version="1.0" encoding="utf-8" ?>
<ContentPage xmlns="http://schemas.microsoft.com/dotnet/2021/maui"
    xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
    x:Class="Northwind.Maui.Client.CategoriesPage"
    Title="Categories">
    <VerticalStackLayout>
        <Label
            Text="Categories"
            VerticalOptions="Center"
            HorizontalOptions="Center" />
        <Button Text="Click Me" WidthRequest="100"
            x:Name="ClickMeButton"
            Clicked="" />
    </VerticalStackLayout>
</ContentPage>
```









Swagger UI

Select a definition Northwind.Maui.WebApi.Service v1

## Northwind.Maui.WebApi.Service 1.0 OAS3

<https://localhost:5181/swagger/v1/swagger.json>

### Northwind.Maui.WebApi.Service

- GET** /api/customers
- POST** /api/customers
- PUT** /api/customers/{id}
- DELETE** /api/customers/{id}

```
{
  "customer": [
    {
      "customerId": "ALFKI",
      "companyName": "Alfreds Futterkiste",
      "contactName": "Maria Anders",
      "contactTitle": "Sales Representative",
      "address": "Obere Str. 57",
      "city": "Berlin",
      "region": null,
      "postalCode": "12209",
      "country": "Germany",
      "phone": "030-0074321",
      "fax": "030-0076545",
      "orders": []
    },
    {
      "customerId": "ANSTR",
      "companyName": "Ana Trujillo Emparedados y helados",
      "contactName": "Ana Trujillo",
      "contactTitle": "Emparedados y helados",
      "address": "Avda. de la Constitución 2222",
      "city": "México D.F.",
      "region": null,
      "postalCode": "05021",
      "country": "Mexico",
      "phone": "(5) 555-4729",
      "fax": "(5) 555-3745",
      "orders": []
    },
    {
      "customerId": "ANTON",
      "companyName": "Antonio Moreno Taquería",
      "contactName": "Antonio Moreno",
      "contactTitle": "Owner",
      "address": "Mataderos 2312",
      "city": "México D.F.",
      "region": null,
      "postalCode": "05023",
      "country": "Mexico",
      "phone": "(5) 555-3932",
      "fax": null,
      "orders": []
    },
    {
      "customerId": "AROUT",
      "companyName": "Around the Horn",
      "contactName": "Thomas Hardy",
      "contactTitle": "Sales Representative",
      "address": "120 Hanover Sq.",
      "city": "London",
      "region": null,
      "postalCode": "W1A 1DP",
      "country": "UK",
      "phone": "(171) 555-7788",
      "fax": "(171) 555-6758",
      "orders": []
    },
    {
      "customerId": "BERGS",
      "companyName": "Berglunds snabbköp",
      "contactName": "Christina Berglund",
      "contactTitle": "Order Administrator",
      "address": "Berguvsvägen 8",
      "city": "Luleå",
      "region": null,
      "postalCode": "S-958 22",
      "country": "Sweden",
      "phone": "0921-12 34 65",
      "fax": "0921-12 34 67",
      "orders": []
    },
    {
      "customerId": "BLAUS",
      "companyName": "Blauer See Delikatessen",
      "contactName": "Hanna",
      "contactTitle": "Sales Representative"
    }
  ]
}
```

File Edit View Git Project Build

Application Insights

CustomersPage.xaml.cs

```

    39
    40
    41
    42
    43
    44 catch (Exception ex)
    45 {
    46     ErrorLabel.Text = ex.Message;
    47 }
    48
    49
    50
  }
```

Customers

BaseAddress: http://10.0.2.2:5182/

91 customers loaded.

- Alfreds Futterkiste  
Berlin, Germany
- Ana Trujillo Emparedados y helados  
México D.F., Mexico
- Antonio Moreno Taquería  
México D.F., Mexico
- Around the Horn  
London, UK
- B's Beverages  
London, UK
- Berglunds snabbköp  
Luleå, Sweden
- Blauer See Delikatessen  
Mannheim, Germany

XAML Live Preview

Android Emulator - pixel\_5\_ - api\_33:5554

Customers

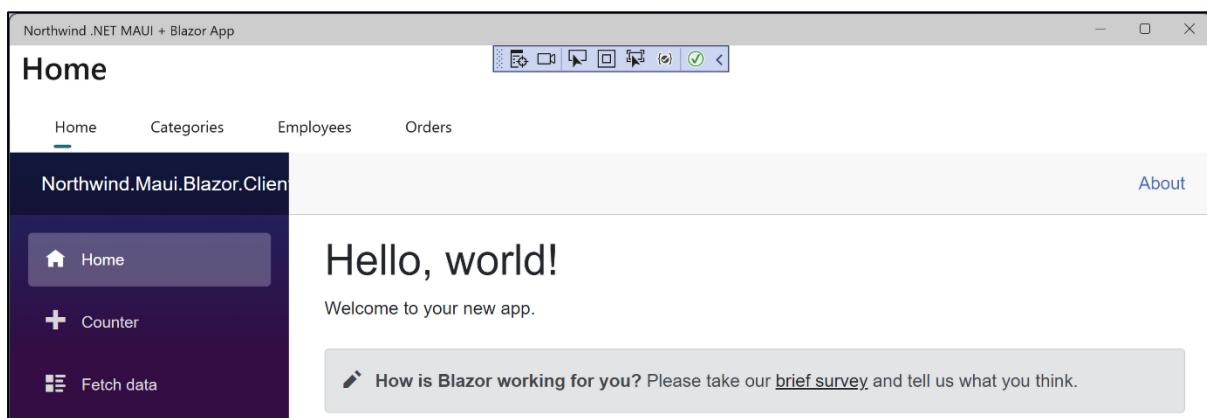
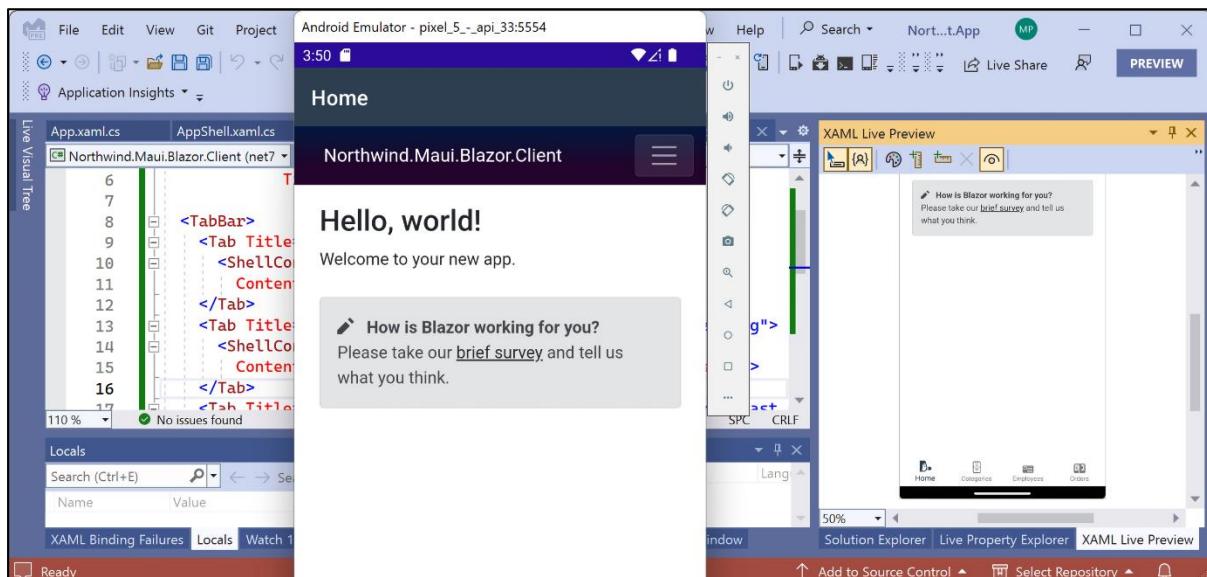
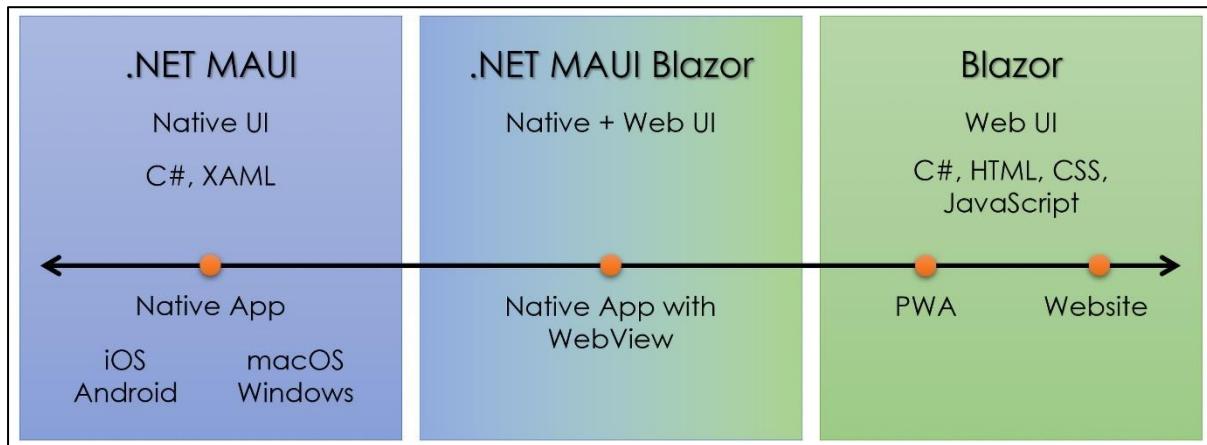
Customers

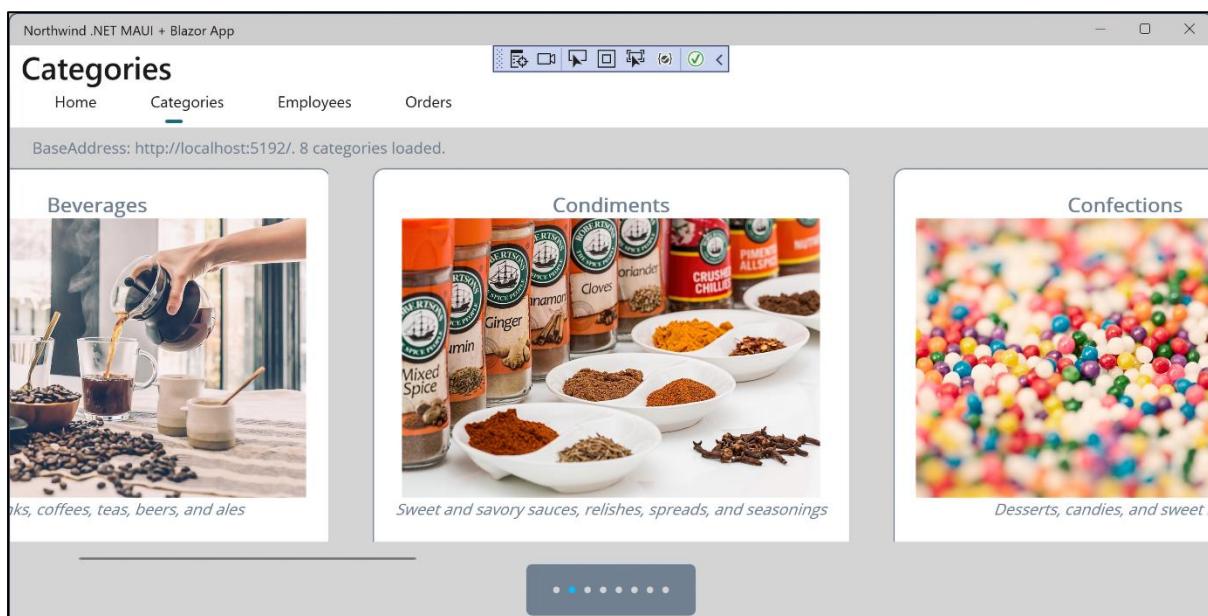
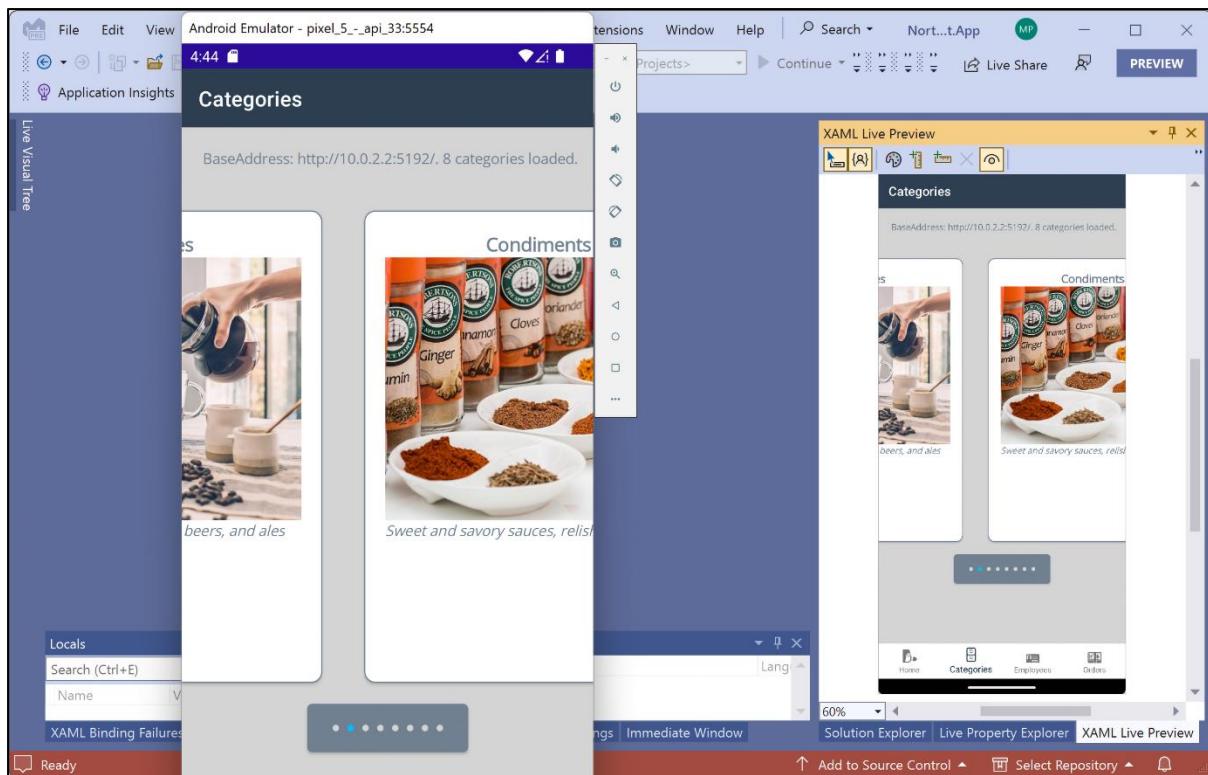
BaseAddress: http://10.0.2.2:5182/

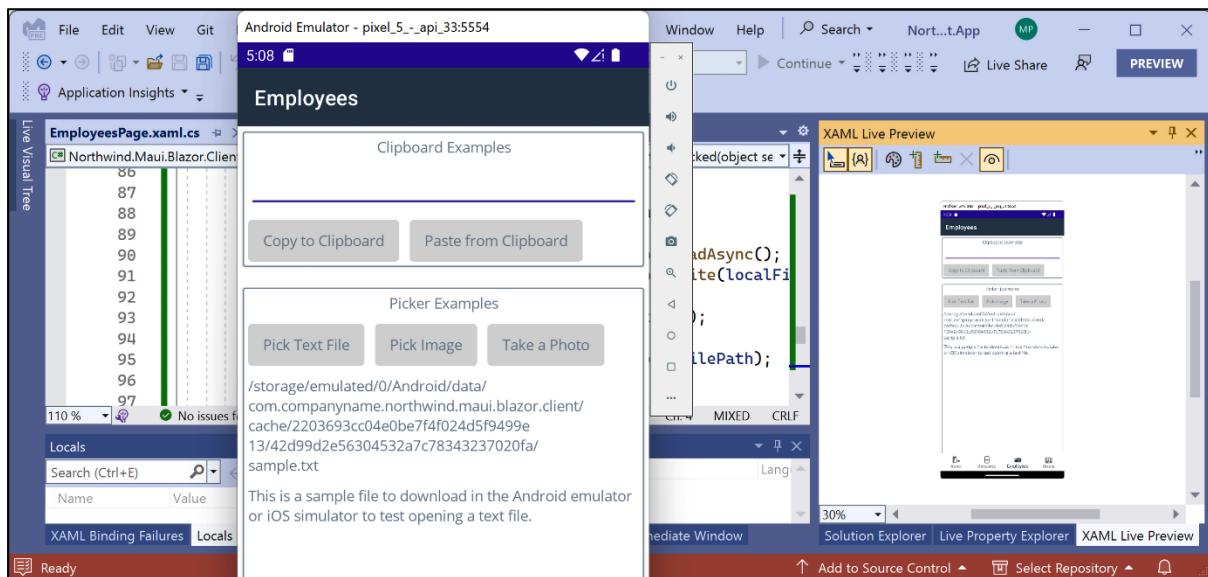
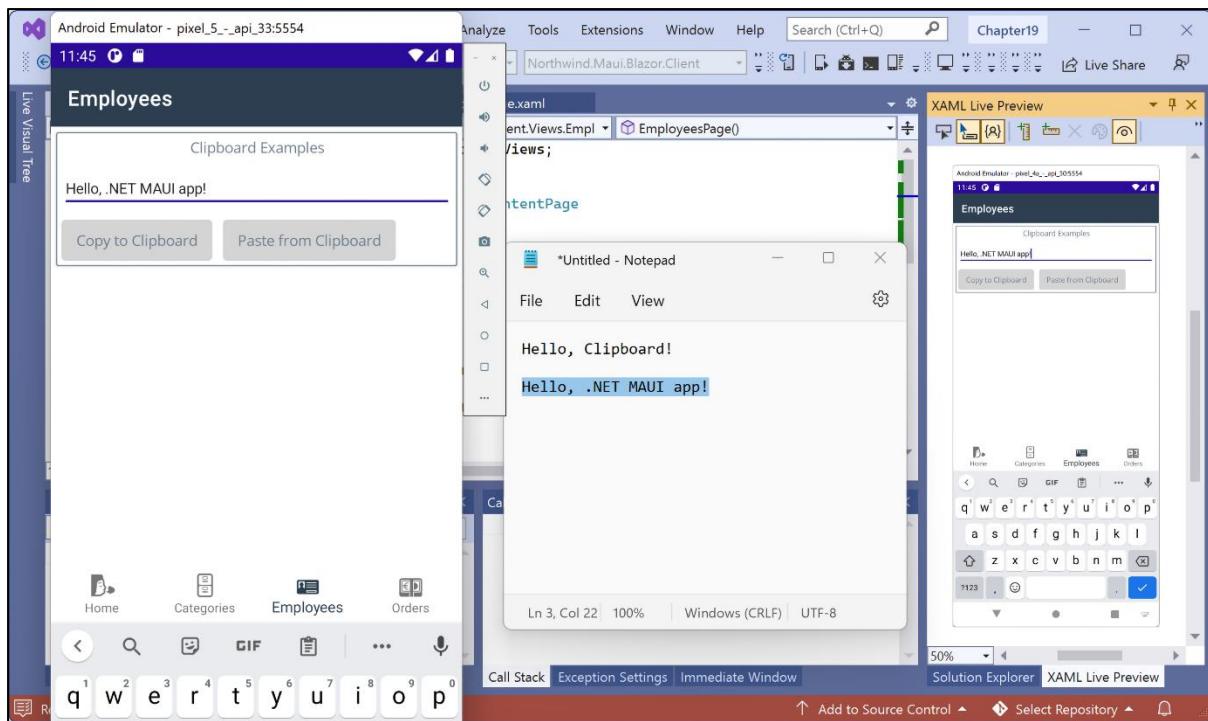
91 customers loaded.

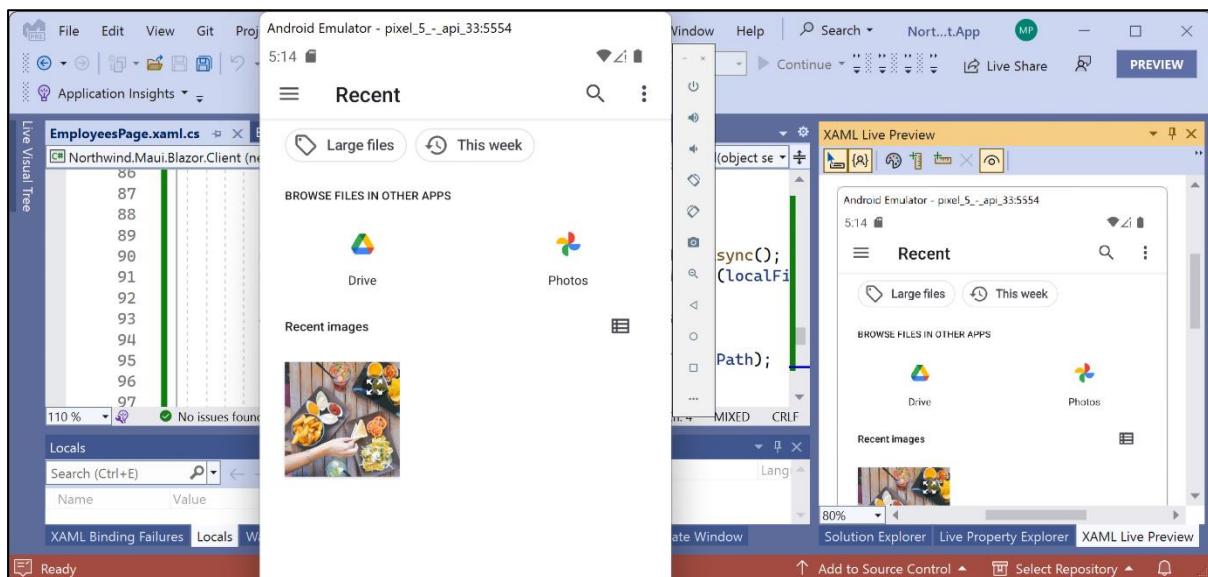
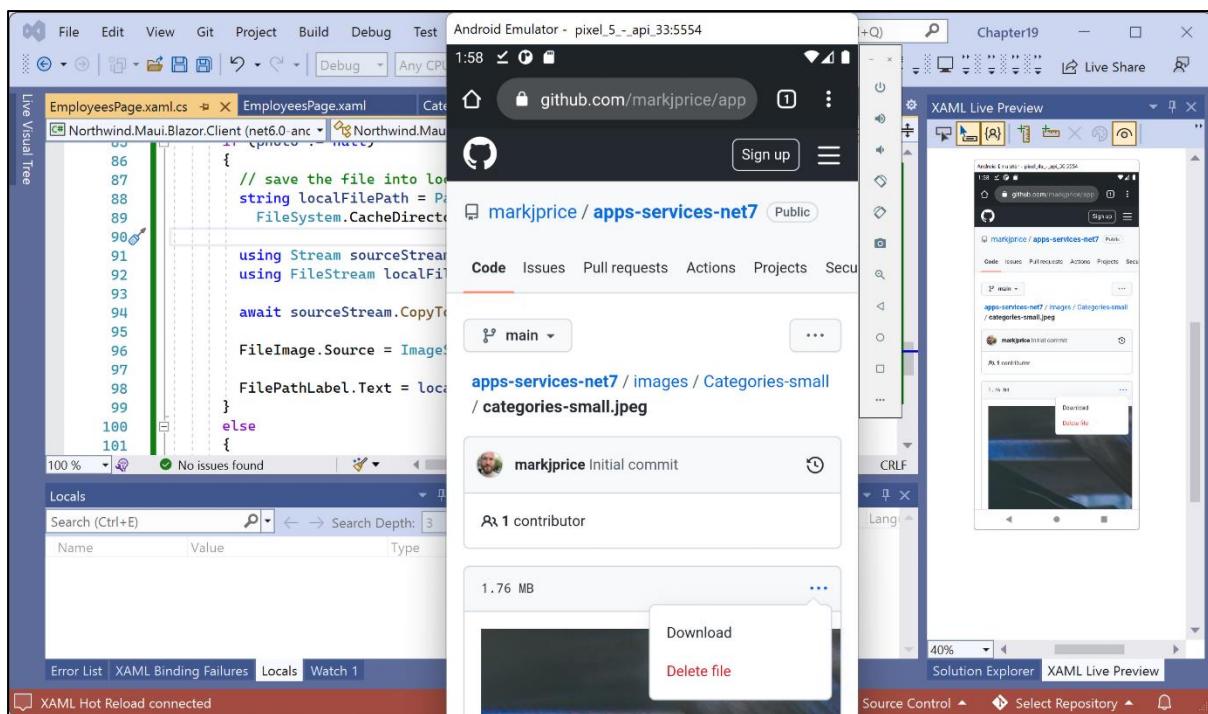
- Alfreds Futterkiste
- Ana Trujillo Emparedados y helados
- Antonio Moreno Taquería
- México D.F., Mexico
- Around the Horn
- B's Beverages
- Berglunds snabbköp
- Luleå, Sweden
- Blauer See Delikatessen
- Mannheim, Germany
- Bildi Gıdalar准备
- Maked, Sipariş
- Marmalade, France
- Santa Barbara Market
- Sierra Madre Delicias
- Delikat Services para Hogar
- Buenos Aires, Argentina
- Santos congelados, Monterrey

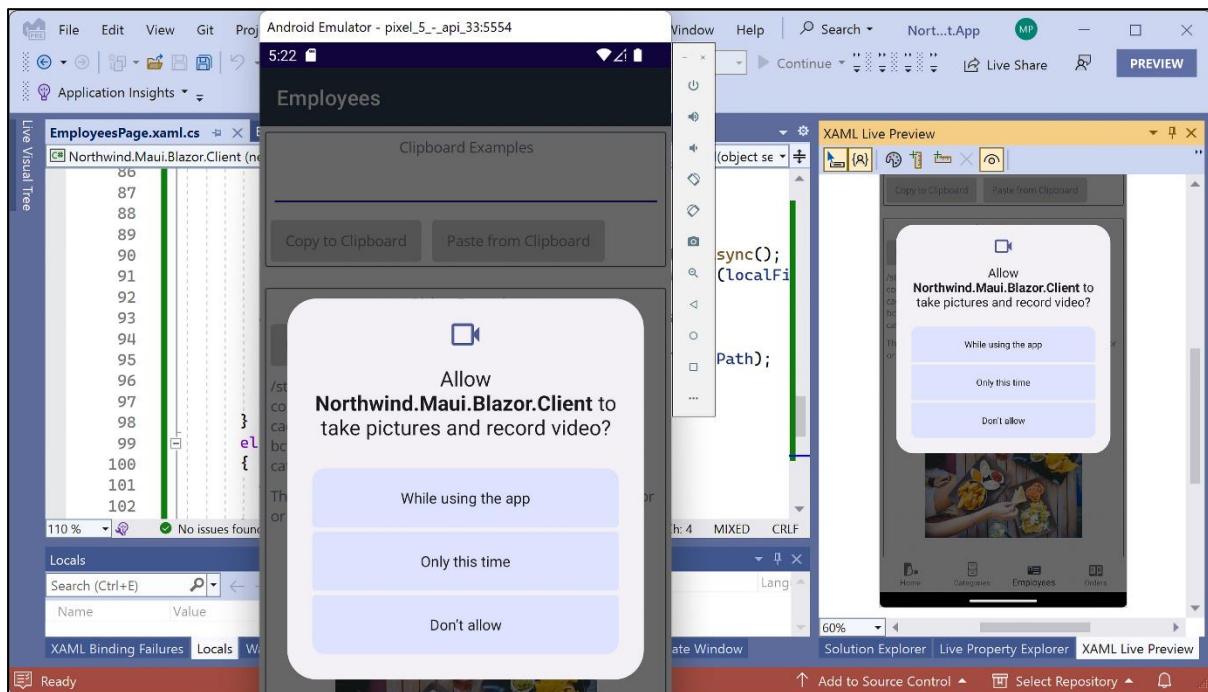
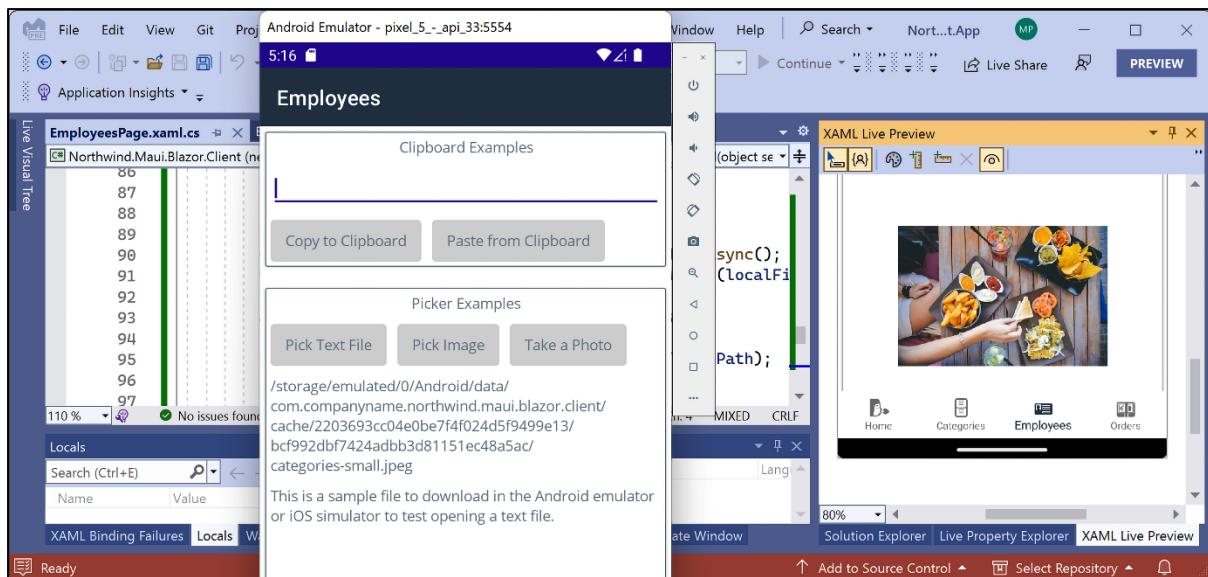
# Chapter 19: Integrating .NET MAUI Apps with Blazor and Native Platforms

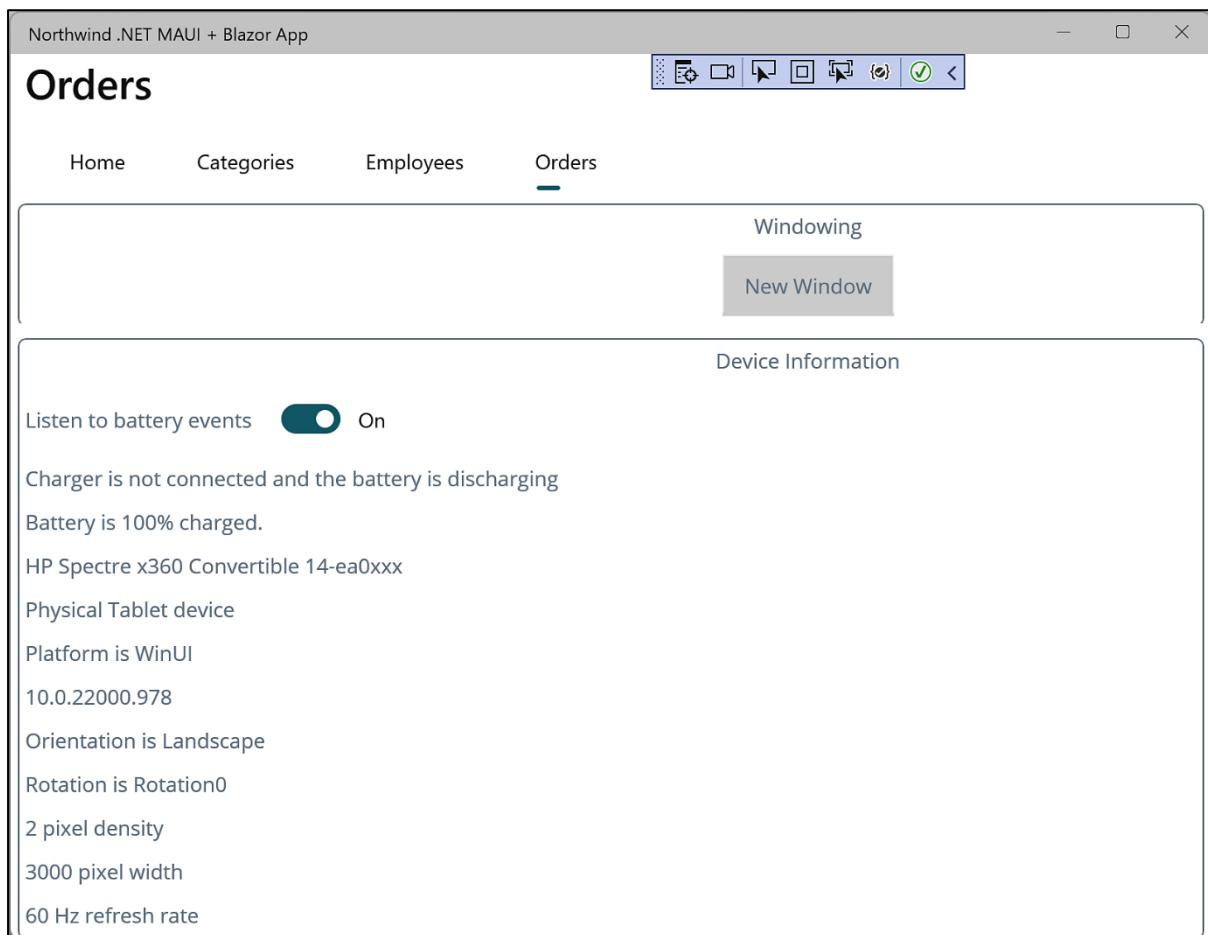
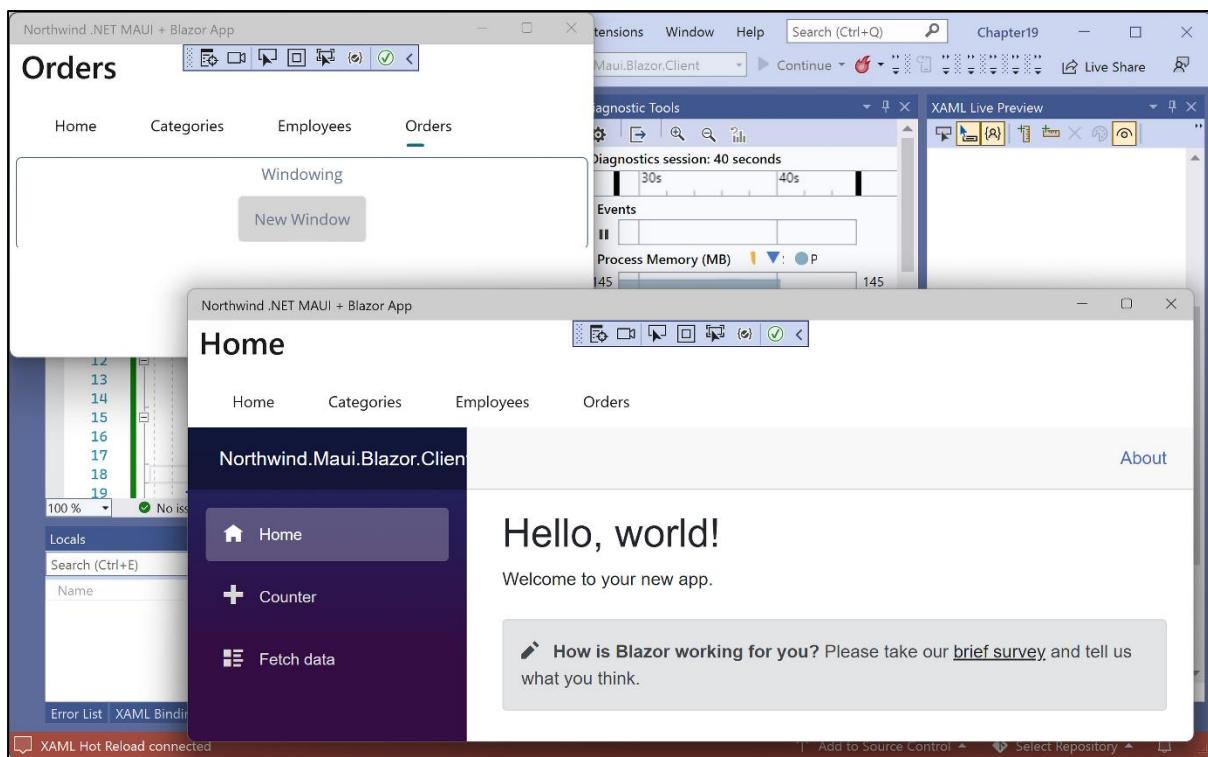


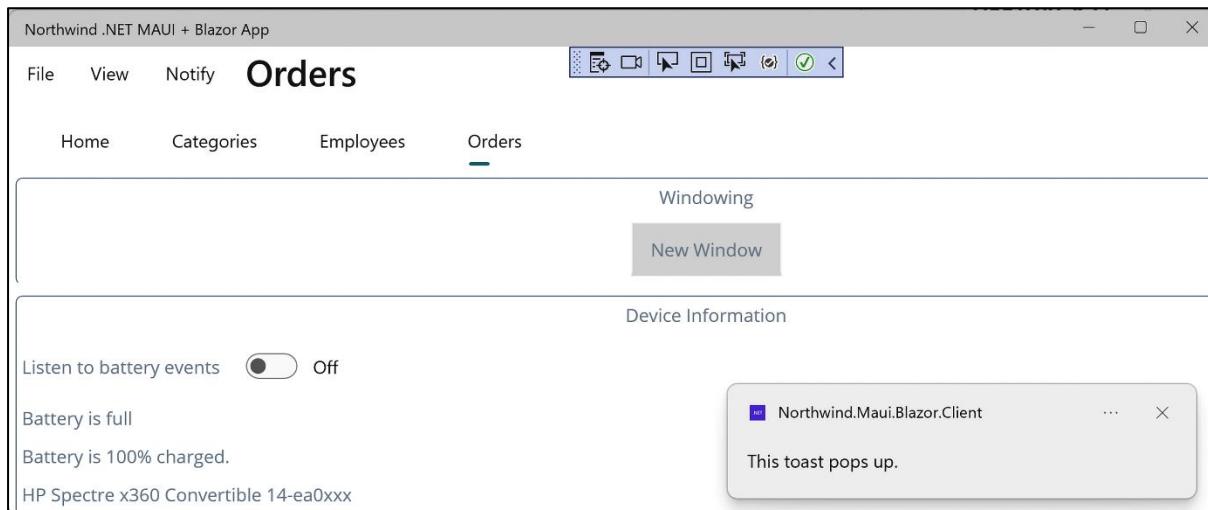
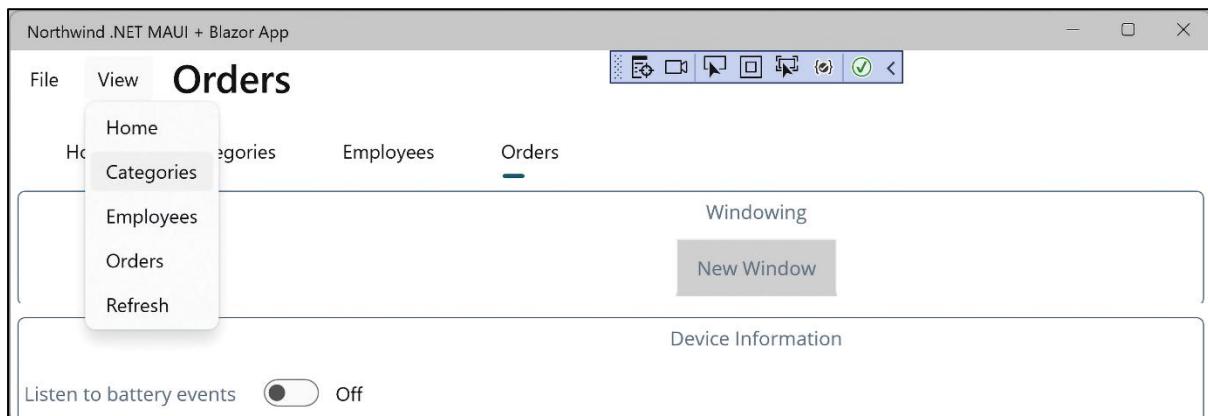
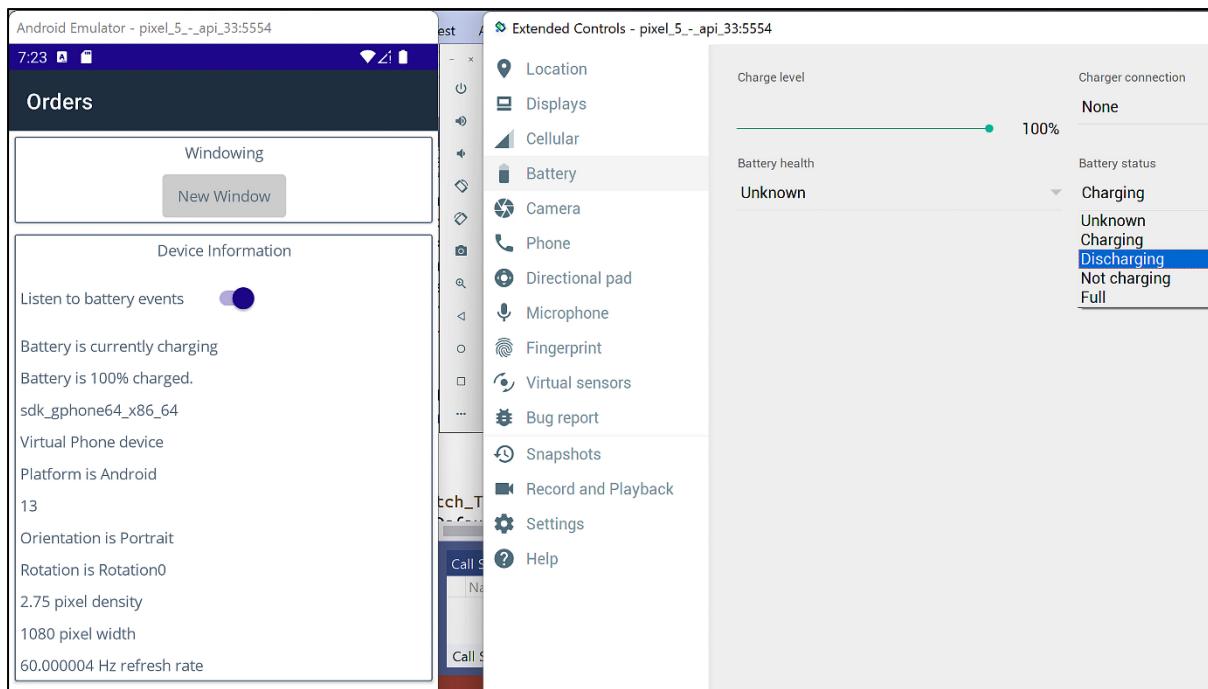




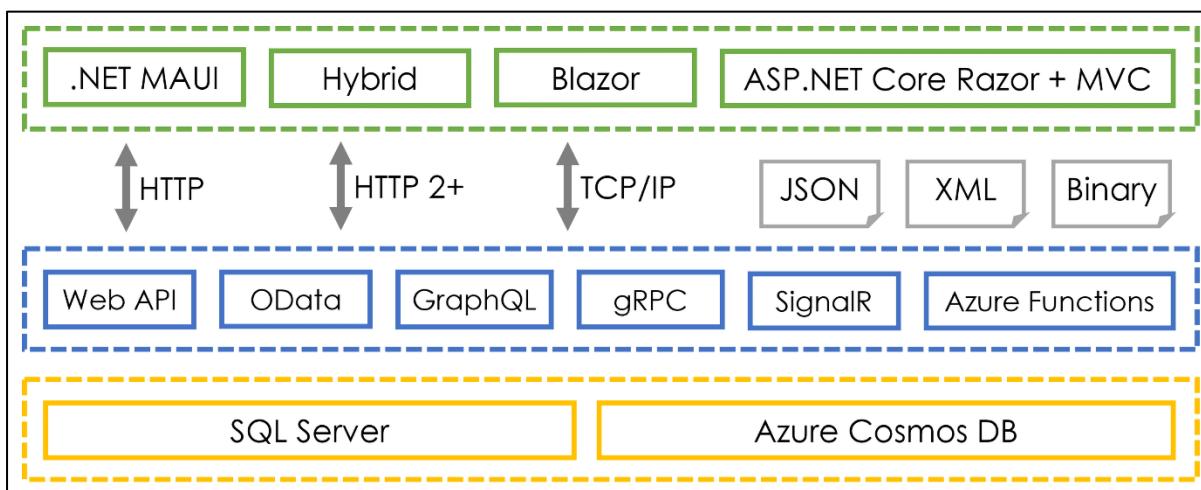






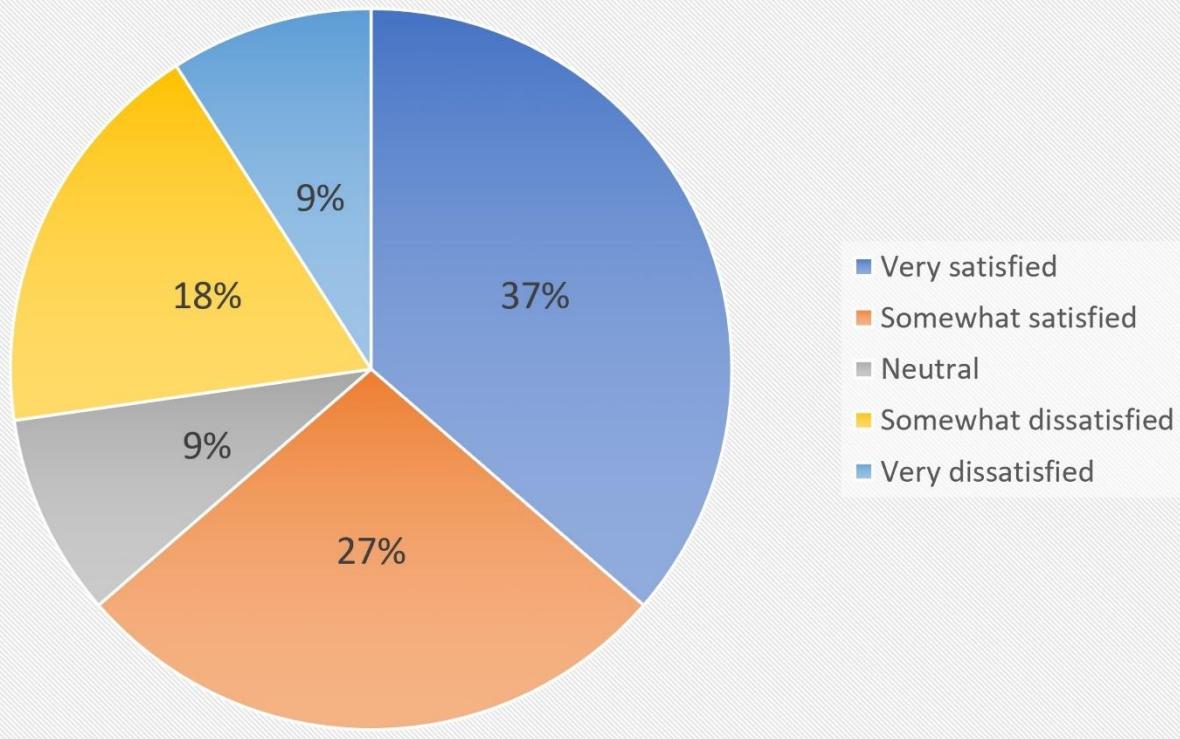


Chapter 20: Introducing the Survey Project Challenge



<p><b>* 1. How would you rate your experience with our product?</b></p> <p><input type="radio"/> Very satisfied      <input type="radio"/> Dissatisfied</p> <p><input type="radio"/> Satisfied      <input type="radio"/> Very dissatisfied</p> <p><input type="radio"/> Neither agree nor disagree</p>	<p><b>3. How satisfied or dissatisfied are you with the following</b></p> <table border="0"> <thead> <tr> <th></th> <th>Very satisfied</th> <th>Satisfied</th> <th>Neither satisfied nor dissatisfied</th> <th>Dissatisfied</th> <th>Very dissatisfied</th> </tr> </thead> <tbody> <tr> <td>The interaction with the sales staff</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Your experience at the register</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>The organization of the store</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>The wait for the fitting room</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>The products offered in the store</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>The price of the products</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>The sizes available at the store</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </tbody> </table>		Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied	The interaction with the sales staff	<input type="radio"/>	Your experience at the register	<input type="radio"/>	The organization of the store	<input type="radio"/>	The wait for the fitting room	<input type="radio"/>	The products offered in the store	<input type="radio"/>	The price of the products	<input type="radio"/>	The sizes available at the store	<input type="radio"/>																												
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<p><b>* 2. How likely is it that you would recommend this company to a friend or colleague?</b></p> <table border="0"> <tr> <td style="text-align: left; vertical-align: middle;">NOT AT ALL LIKELY</td> <td style="text-align: right; vertical-align: middle;">EXTREMELY LIKELY</td> </tr> <tr> <td colspan="2"> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> </table> </td> </tr> </table>		NOT AT ALL LIKELY	EXTREMELY LIKELY	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> </table>		0	1	2	3	4	5	6	7	8	9	10																																	
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0	1	2	3	4	5	6	7	8	9	10																																							
<p><b>5. What changes would this company have to make for you to give it an even higher rating?</b></p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div>																																																	

## How satisfied are you with our service?



The screenshot displays a survey builder interface with two main sections: **BUILD** and **STYLE**.

**BUILD Section:**

- Style:** Options include Single Textbox, Slider, Payment (Stripe), Matrix of Dropdown Menus, Multiple Textboxes, Date / Time, Contact Information, Text, Image, Text A/B Test, and Image A/B Test.
- Logic:** Options include Multiple Choice, Checkboxes, and Dropdown.
- Options:** Options include Star Rating, Matrix / Rating Scale, File Upload, Ranking, Net Promoter® Score, Image Choice, and Click Map.
- Question Bank:** Options include Comment Box, Single Textbox, Slider, Payment (Stripe), Matrix of Dropdown Menus, Multiple Textboxes, Date / Time, Contact Information, Text, Image, Text A/B Test, and Image A/B Test.
- Format:** Options include Scribble, Your Logo, Footer, Fonts, Layout, Background, Colors, and Edit.
- Print:** Options include Print and Collapsible sections.

**STYLE Section:**

- Style:** Options include Scribble, Your Logo, Footer, Fonts, Layout, Background, Colors, and Edit.
- Logic:** Options include Plus icon and a green circular icon.
- Options:** Options include Plus icon and a green circular icon.
- Question Bank:** Options include Plus icon and a green circular icon.
- Format:** Options include Plus icon and a green circular icon.
- Print:** Options include Plus icon and a green circular icon.

# Chapter 21: Epilogue

