

Entity Framework

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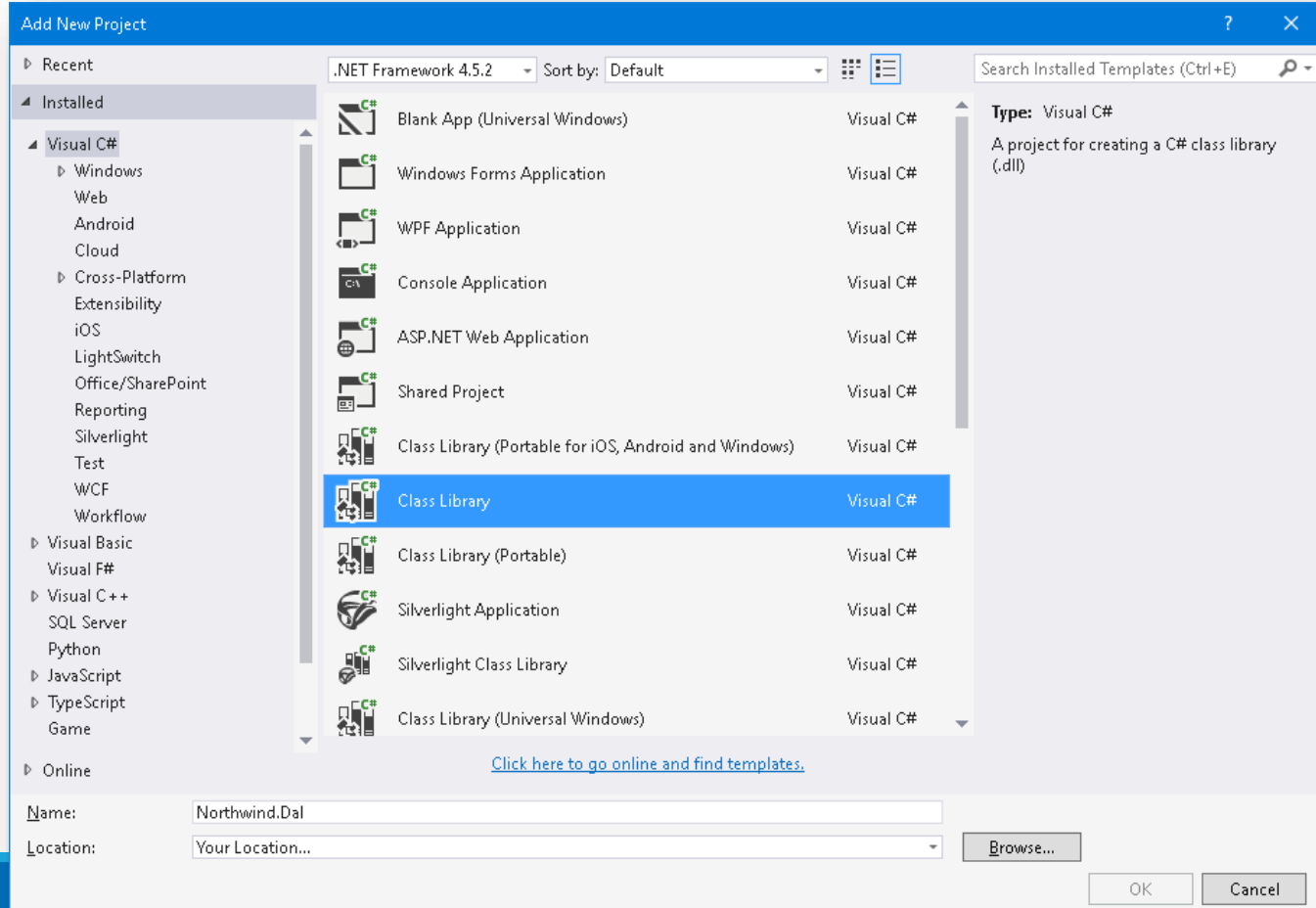
What is the ADO.NET Entity Framework?

- ADO.NET is an abbreviation for **ActiveX Data Object.NET**, which is part of Microsoft's larger .NET framework.
- ADO.NET Entity Framework is an **Object/Relational Mapping** (ORM) framework that enables developers\testers to work with relational data as domain-specific objects, eliminating the need for most of the data access plumbing code (DataSets, DataReaders, etc.).



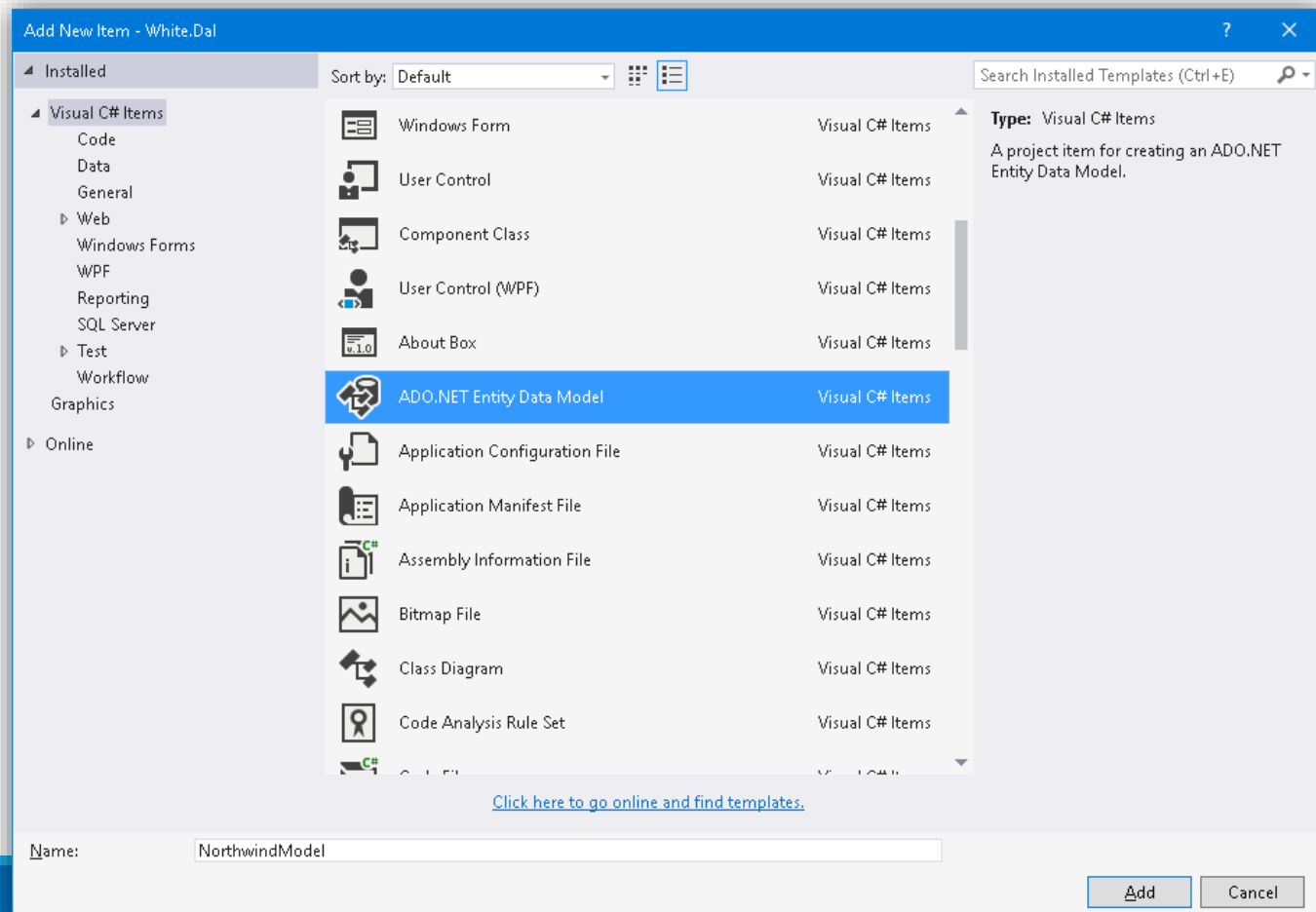
Create a Class Library project

Step 1:



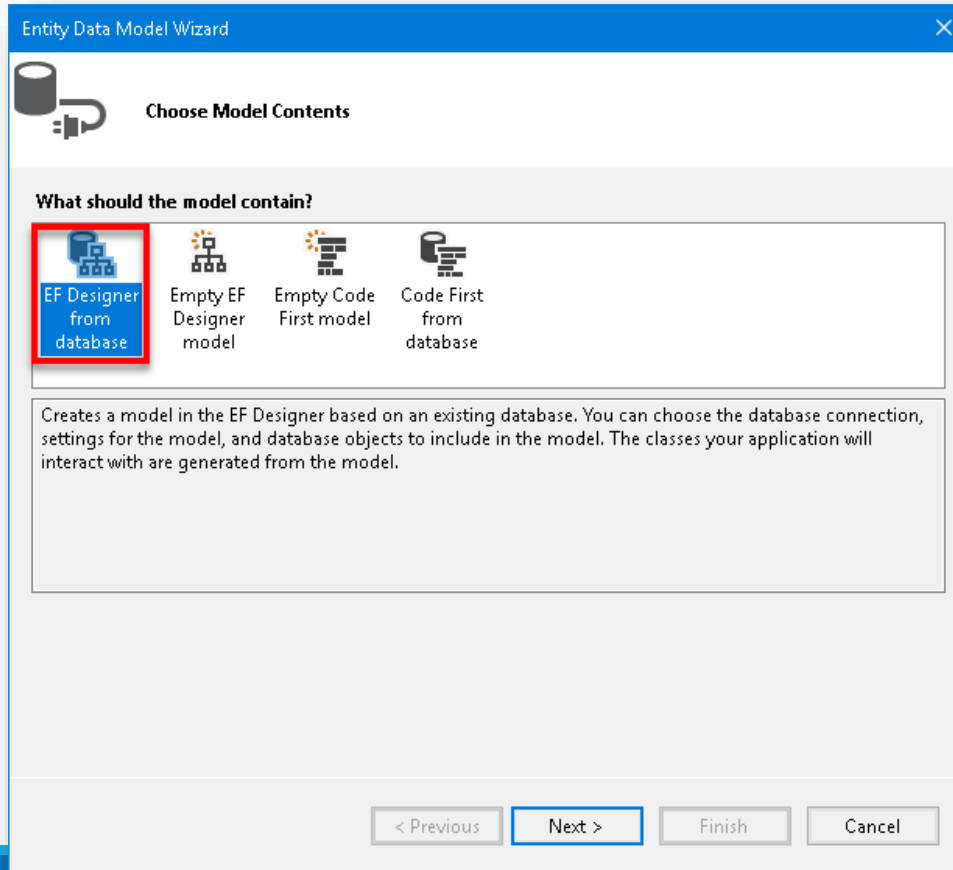
Creating ADO.NET Entity Data Model

Step 2:



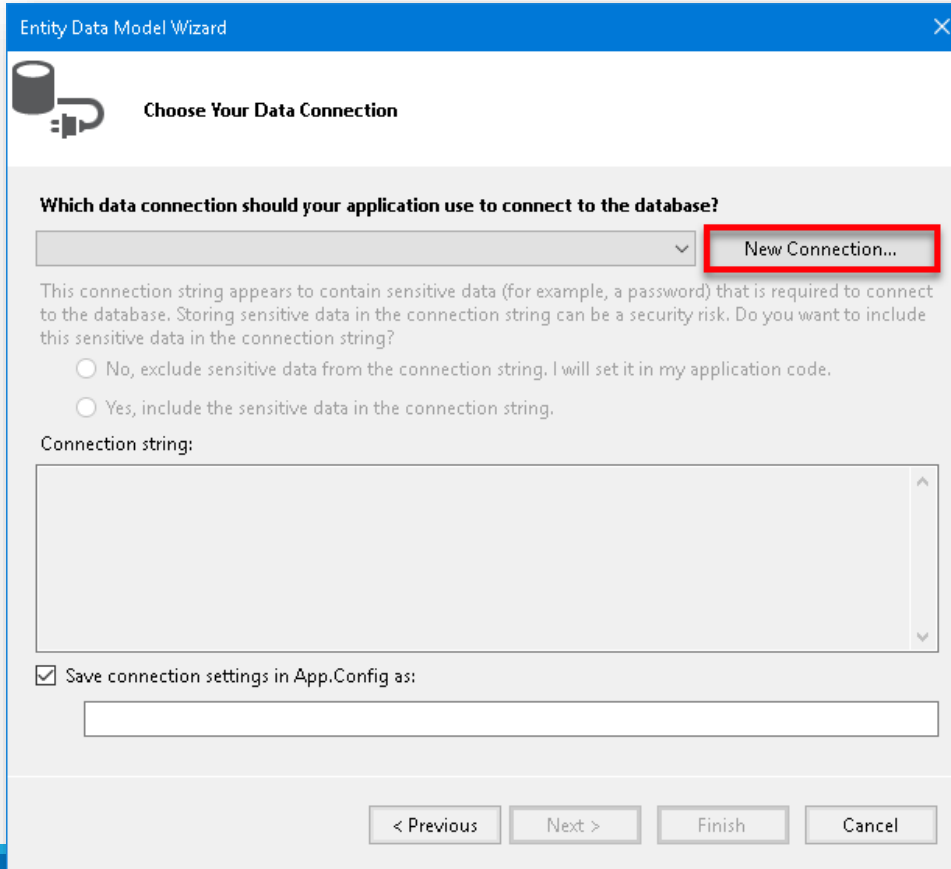
Creating ADO.NET Entity Data Model

Step 3:



Creating ADO.NET Entity Data Model

Step 4:



The screenshot shows the 'Entity Data Model Wizard' window, specifically the 'Choose Your Data Connection' step. The window has a blue title bar with the text 'Entity Data Model Wizard' and a close button. Below the title bar is a header area with a database icon and the text 'Choose Your Data Connection'. The main content area asks the question 'Which data connection should your application use to connect to the database?'. There is a dropdown menu with a downward arrow, and a 'New Connection...' button is highlighted with a red rectangle. Below this, a paragraph explains that the connection string might contain sensitive data like a password and asks if it should be included. There are two radio buttons: 'No, exclude sensitive data from the connection string. I will set it in my application code.' and 'Yes, include the sensitive data in the connection string.'. Below the radio buttons is a label 'Connection string:' followed by a large text area for entering the connection string. At the bottom, there is a checkbox labeled 'Save connection settings in App.Config as:' which is checked, followed by a text box for the filename. At the very bottom, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

Entity Data Model Wizard

Choose Your Data Connection

Which data connection should your application use to connect to the database?

New Connection...

This connection string appears to contain sensitive data (for example, a password) that is required to connect to the database. Storing sensitive data in the connection string can be a security risk. Do you want to include this sensitive data in the connection string?

☐ No, exclude sensitive data from the connection string. I will set it in my application code.

☐ Yes, include the sensitive data in the connection string.

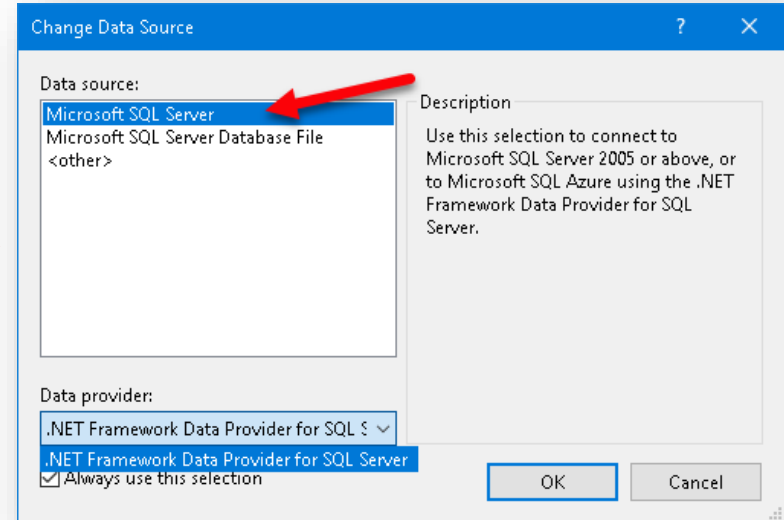
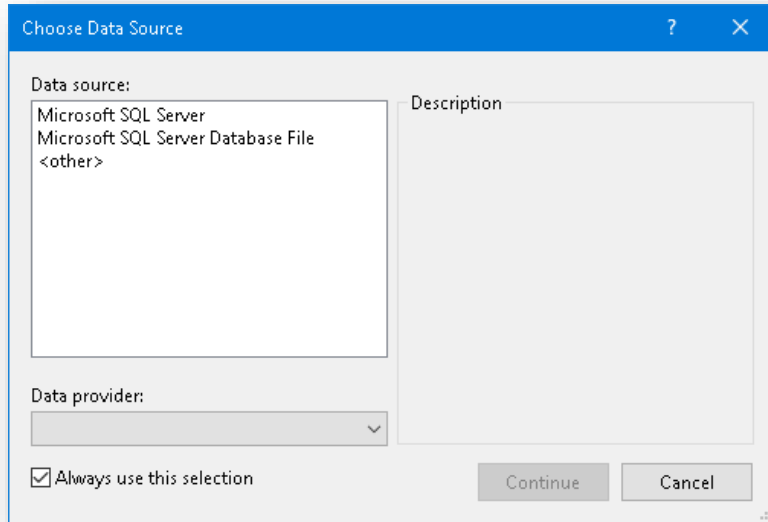
Connection string:

☒ Save connection settings in App.Config as:

< Previous Next > Finish Cancel

Creating ADO.NET Entity Data Model

Step 5:



Creating ADO.NET Entity Data Model

Step 6:

Connection Properties

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) Change...

Server name: Refresh

Log on to the server

Authentication: Windows Authentication

User name: Password: Save my password

Connect to a database

Select or enter a database name: Attach a database file: Browse... Logical name: Advanced...

Test Connection OK Cancel

Connection Properties

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) Change...

Server name: (localdb)\v11.0 Refresh

Log on to the server

Authentication: Windows Authentication

User name: Password: Save my password

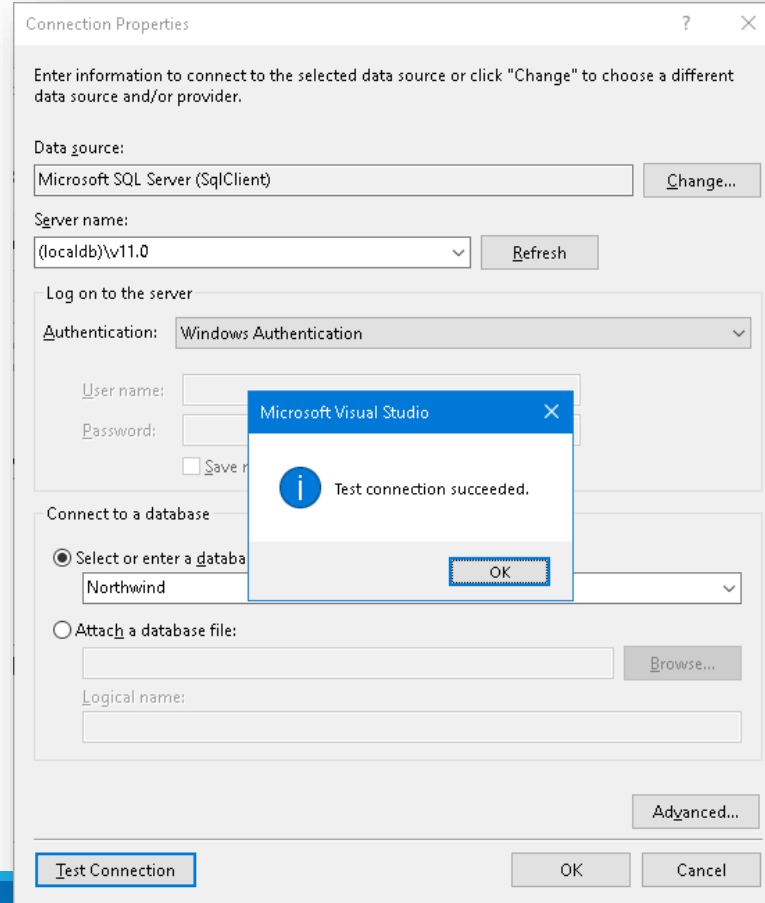
Connect to a database

Select or enter a database name: Northwind Attach a database file: Browse... Logical name: Advanced...

Test Connection OK Cancel

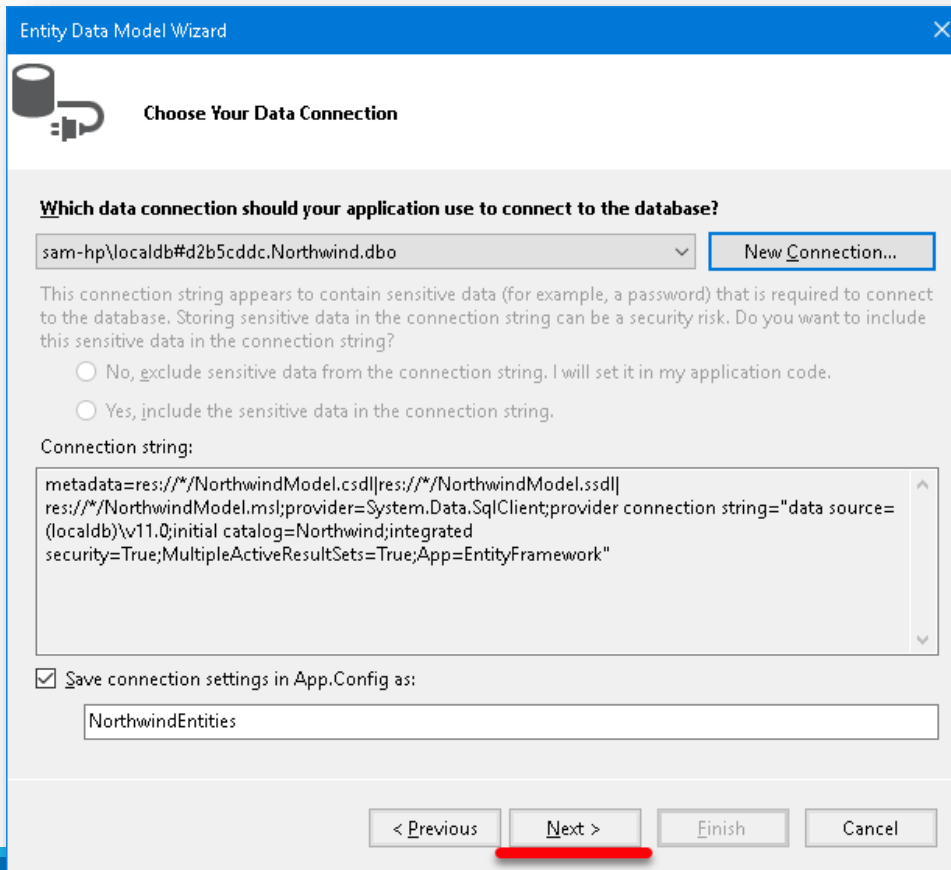
Creating ADO.NET Entity Data Model

Step 7:



Creating ADO.NET Entity Data Model

Step 8:



The screenshot shows the 'Entity Data Model Wizard' window, specifically the 'Choose Your Data Connection' step. The window has a blue title bar and a white background. At the top left, there is a database icon and the title 'Entity Data Model Wizard'. Below this, the text 'Choose Your Data Connection' is displayed. The main area contains a question: 'Which data connection should your application use to connect to the database?'. Below the question is a dropdown menu showing 'sam-hp\localdb#d2b5cddc.Northwind.dbo' and a 'New Connection...' button. A warning message follows: 'This connection string appears to contain sensitive data (for example, a password) that is required to connect to the database. Storing sensitive data in the connection string can be a security risk. Do you want to include this sensitive data in the connection string?'. There are two radio buttons: 'No, exclude sensitive data from the connection string. I will set it in my application code.' and 'Yes, include the sensitive data in the connection string.'. Below this is a section labeled 'Connection string:' with a text area containing the connection string: 'metadata=res://*/NorthwindModel.csdl|res://*/NorthwindModel.ssdl|res://*/NorthwindModel.msl;provider=System.Data.SqlClient;provider connection string="data source=(localdb)\v11.0;initial catalog=Northwind;integrated security=True;MultipleActiveResultSets=True;App=EntityFramework"'. At the bottom, there is a checkbox labeled 'Save connection settings in App.Config as:' which is checked. Below the checkbox is a text box containing 'NorthwindEntities'. At the very bottom, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'. The 'Next >' button is highlighted with a red underline.

Entity Data Model Wizard

Choose Your Data Connection

Which data connection should your application use to connect to the database?

sam-hp\localdb#d2b5cddc.Northwind.dbo New Connection...

This connection string appears to contain sensitive data (for example, a password) that is required to connect to the database. Storing sensitive data in the connection string can be a security risk. Do you want to include this sensitive data in the connection string?

☐ No, exclude sensitive data from the connection string. I will set it in my application code.

☐ Yes, include the sensitive data in the connection string.

Connection string:

```
metadata=res://*/NorthwindModel.csdl|res://*/NorthwindModel.ssdl|
res://*/NorthwindModel.msl;provider=System.Data.SqlClient;provider connection string="data source=
(localdb)\v11.0;initial catalog=Northwind;integrated
security=True;MultipleActiveResultSets=True;App=EntityFramework"
```

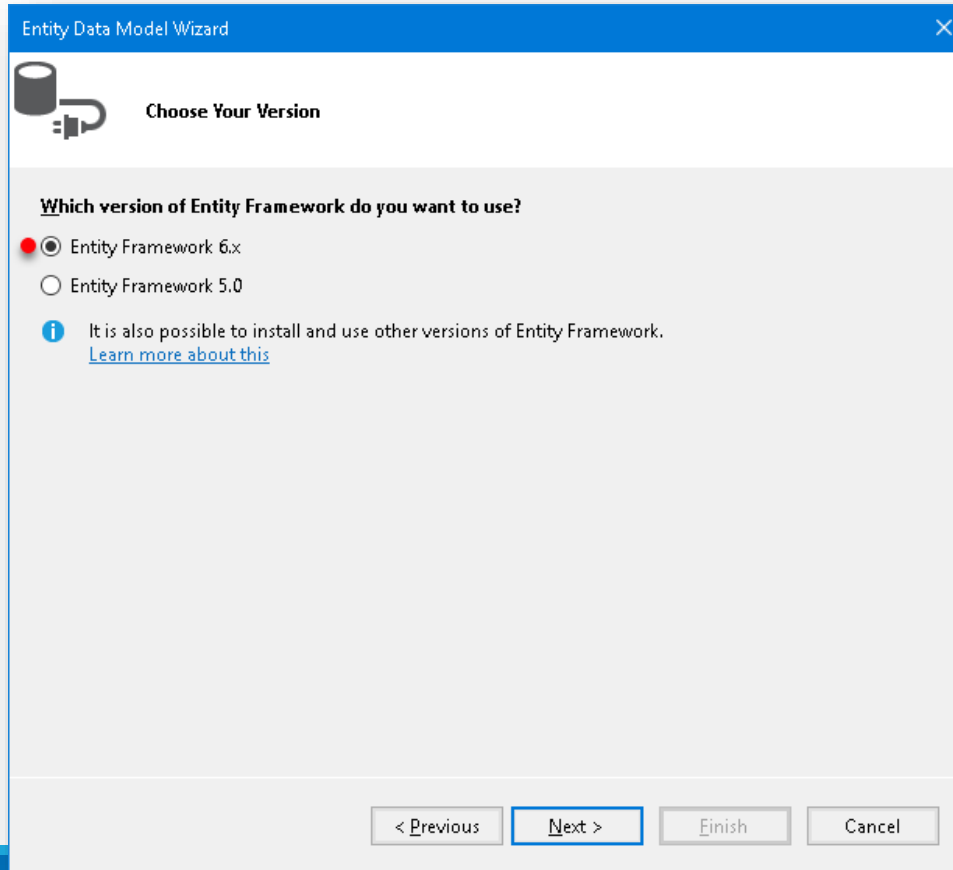
☒ Save connection settings in App.Config as:

NorthwindEntities

< Previous **Next >** Finish Cancel

Creating ADO.NET Entity Data Model

Step 9:



Creating ADO.NET Entity Data Model

Step 10:

Entity Data Model Wizard

Choose Your Database Objects and Settings

Which database objects do you want to include in your model?

- ☒ Tables
 - ☒ dbo
 - ☒ Department
 - ☒ Employee
 - ☒ Project
 - ☒ ProjectInvolvement
 - ☐ Views
 - ☐ Stored Procedures and Functions

☒ Pluralize or singularize generated object names

☒ Include foreign key columns in the model

☐ Import selected stored procedures and functions into the entity model

Model Namespace:

NorthwindModel

< Previous Next > **Finish** Cancel

Security Warning

Running this text template can potentially harm your computer. Do not run it if you obtained it from an untrusted source.

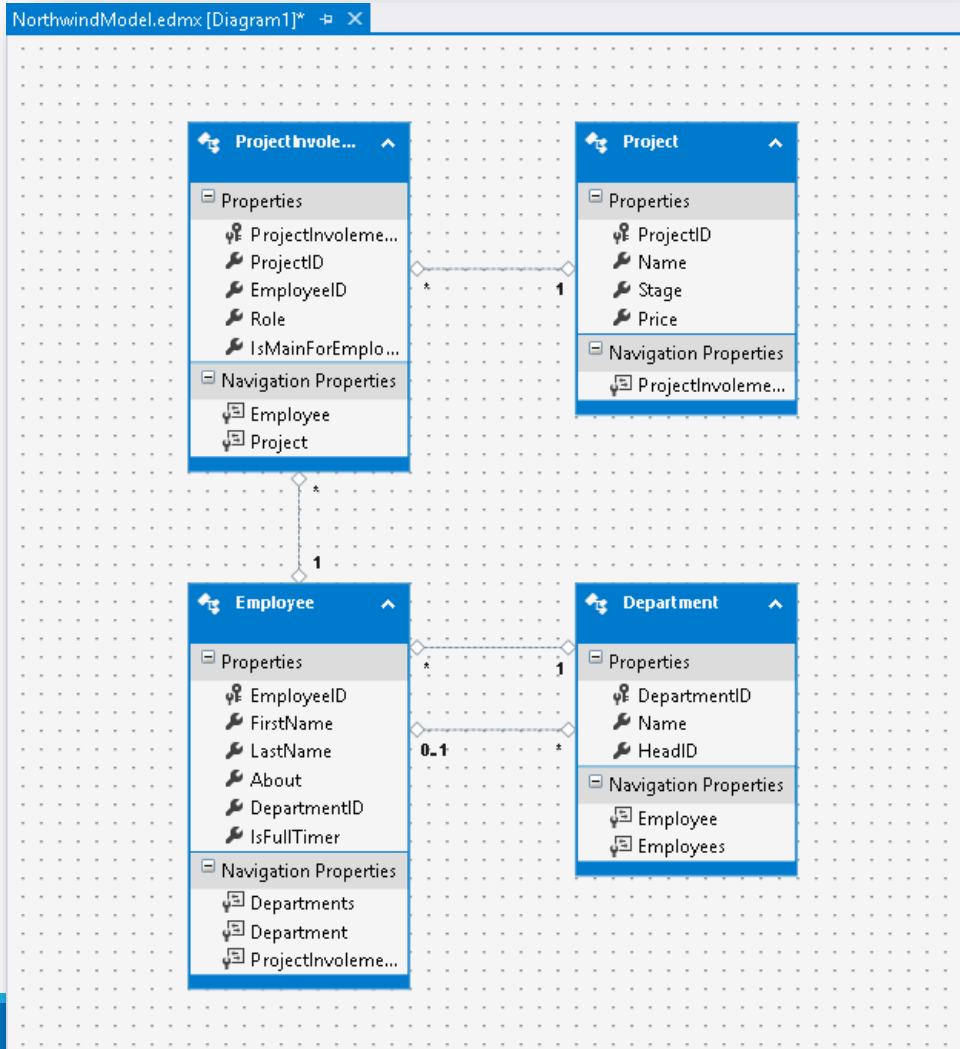
Click OK to run the template.
Click Cancel to stop the process.

☐ Do not show this message again

OK Cancel

Model

Step 11:



EF



Demo

Insert data with EF

```
public bool CreateDepartment(string name)
{
    Department depto = GetDepartment(name);

    if (depto == null)
    {
        using (var _dbContext = new NorthwindEntities())
        {
            depto = new Department();
            depto.Name = name;

            _dbContext.Departments.Add(depto); ←

            if (_dbContext.SaveChanges() > 0) ←
            {
                return true;
            }

            return false;
        }
    }

    return false;
}
```



Get data with EF

```
public Department GetDepartment(string name)
{
    using (var _dbContext = new NorthwindEntities())
    {
        return _dbContext.Departments.FirstOrDefault(d =>
            d.Name.Equals(name));
    }
}
```

```
public List<Department> GetDepartment2(string name)
{
    List<Department> departmentResult;
    using (var _dbContext = new NorthwindEntities())
    {
        var query = from depto in _dbContext.Departments
                     where depto.Name.Equals(name)
                     select depto;

        departmentResult = query.ToList();
    }

    if (departmentResult.Count() > 0)
    {
        return departmentResult;
    }

    return null;
}
```



Update data with EF

```
public bool UpdateDepartment(Department department, string newName)
{
    using (var _dbContext = new NorthwindEntities())
    {
        var departmentUpdated = _dbContext.Departments.Attach(department); ←
        departmentUpdated.Name = newName; ←
        if (_dbContext.SaveChanges() > 0) ←
        {
            return true;
        }
        return false;
    }
}
```



Delete data with EF

```
public bool DeleteDepartment(string name)
{
    Department depto = GetDepartment(name);

    if (depto != null)
    {
        using (var _dbContext = new NorthwindEntities())
        {
            _dbContext.Departments.Attach(depto); ←
            _dbContext.Departments.Remove(depto); ←

            if (_dbContext.SaveChanges() > 0) ←
            {
                return true;
            }
        }
    }

    return false;
}
```



Tests

```
[TestFixture]
public class DepartmentTests
{
    [Test]
    public void CreateDepartmentDb()
    {
        Assert.IsTrue(Entities.DepartmentEntity.CreateDepartment("New Department"));

        Assert.IsTrue(Entities.DepartmentEntity.DeleteDepartment("New Department"));
    }
}
```





Q&A

