Lab 02. Building an Product Management Application using WPF application and Entity Framework Core

1. Introduction

Imagine you're an employee of a store named **ProductStore**. Your manager has asked you to develop a WPF application for product management. The application has to support adding, viewing, modifying, and removing products—a standardized usage action verbs better known as Create, Read, Update, Delete (CRUD).

This lab explores creating an application using WPF with .NET Core, and C#. An **SQL Server Database** will be created to persist the car's data that will be used for reading and managing product data by **Entity Framework Core**

2. Lab Objectives

In this lab, you will:

- Use the Visual Studio.NET to create WPF application and Class Library (.dll) project.
- Create a SQL Server database named MyStoreDB that has a Product, Category, AccountMember tables.
- Apply Repository pattern in a project.
- Add CRUD action methods to WPF application.
- Run the project and test the WPF application actions.

3. Database Design (MyStore)

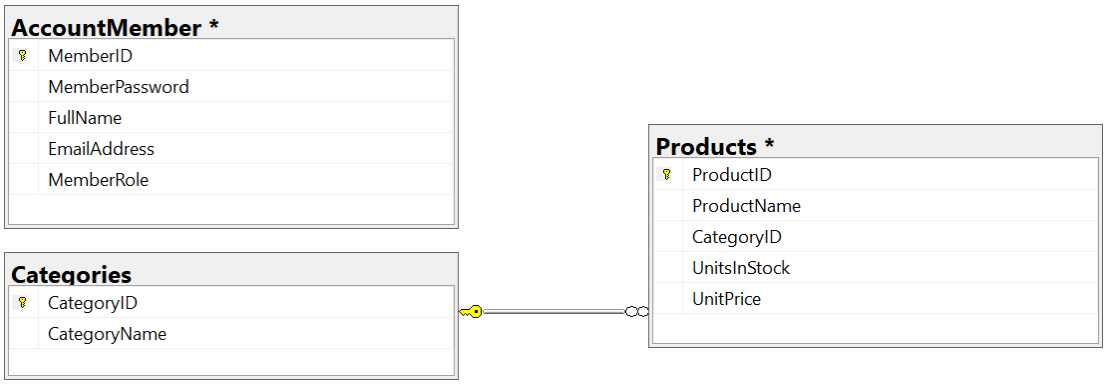


Table AccountMember

TV\SQLEXPRESS01...bo.AccountMember*

Column Name	Data Type	Allow Nulls
MemberID	nvarchar(20)	☐
MemberPassword	nvarchar(80)	☐
FullName	nvarchar(80)	☐
EmailAddress	nvarchar(100)	☐
MemberRole	int	☐
		☐

Table Categories

TV\SQLEXPRESS01.M...- dbo.Categories

Column Name	Data Type	Allow Nulls
CategoryID	int	☐
CategoryName	nvarchar(15)	☐
		☐

Table Products

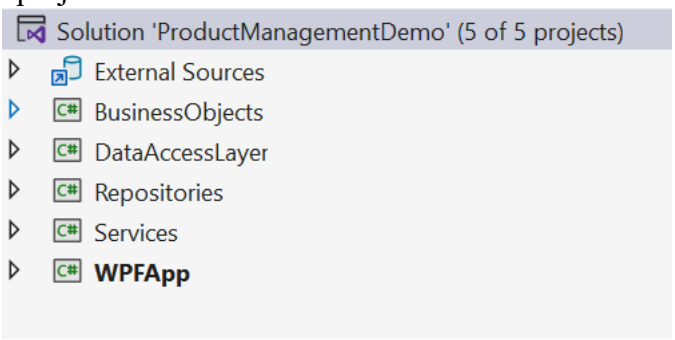
TV\SQLEXPRESS01.M...re - dbo.Products*

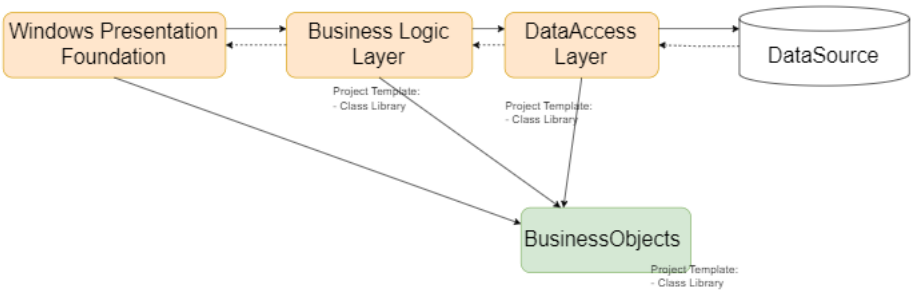
Column Name	Data Type	Allow Nulls
ProductID	int	☐
ProductName	nvarchar(40)	☐
CategoryID	int	☐
UnitsInStock	smallint	☑
UnitPrice	money	☑
		☐

Activity 01: Build a solution by Visual Studio.NET

Create a Blank Solution named **ProductManagementDemo** then add new a **Class Library** project named **BusinessObjects, DataAccessObjects, Repositories, Services** and a WPF project named **ProductManagement**

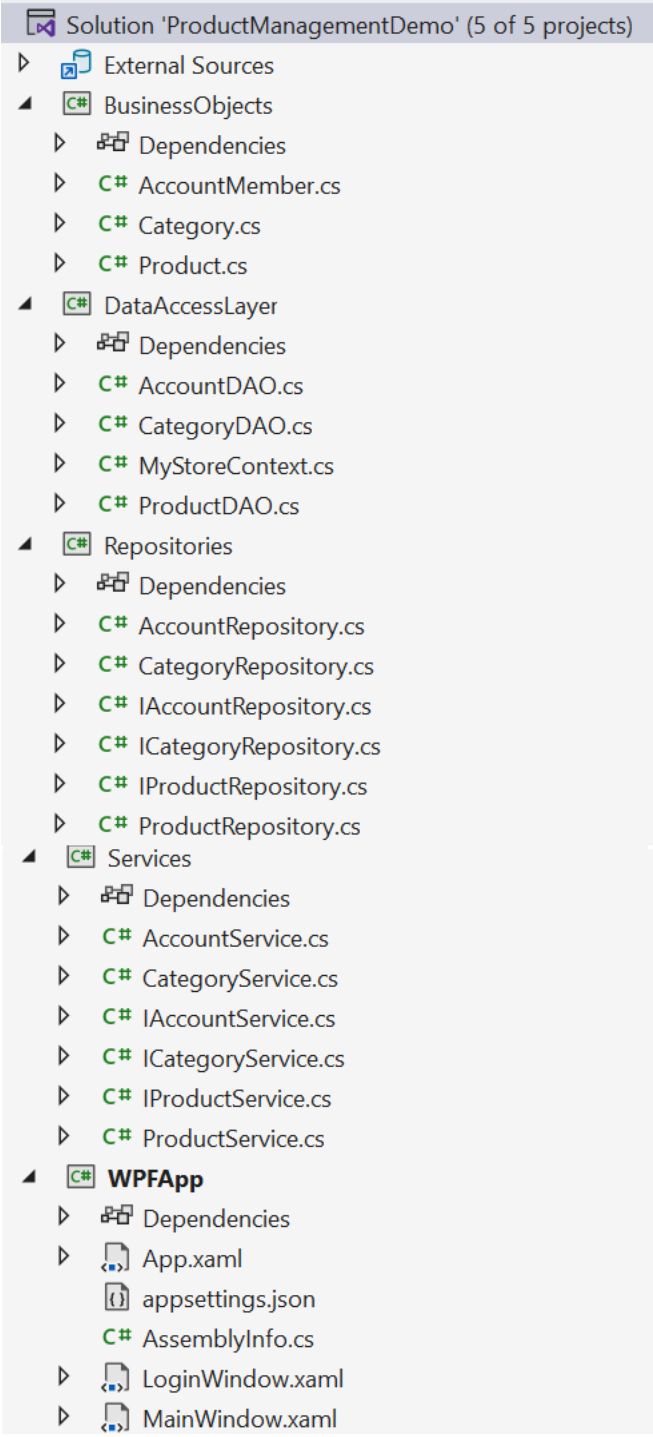
Step 01. Create a Blank solution.
Step 02. Create 4 **Class Library** projects.
Step 03. Create a WPF project.





Note:

- **Data Source** in this case is the SQL Server Database
- **Services Project** – This project represents a layer or component responsible for implementing the business logic of an application.
- **Repository Project** – This project provides an abstraction layer between the application's business logic and the underlying data source.
- **Data Access Layer Project** – This project used to abstract and encapsulate the logic for accessing data from a data source, such as a database.



Activity 02: Write codes for the BusinessObjects project

Step 01. Install the following packages from NuGet:

- Microsoft.EntityFrameworkCore.SqlServer --version 8.0.2
- Microsoft.EntityFrameworkCore.Tools --version 8.0.2

- Microsoft.Extensions.Configuration.Json --version 8.0.0

Check the tool for EFCore (install/uninstall tool if needed) (dotnet SDK 8.0.202)

dotnet tool install --global dotnet-ef --version 8.0.2
dotnet tool uninstall --global dotnet-ef

Step 02. Right-click on project , select **Open In Terminal.** On **Developer PowerShell** dialog execute the following commands to generate model:

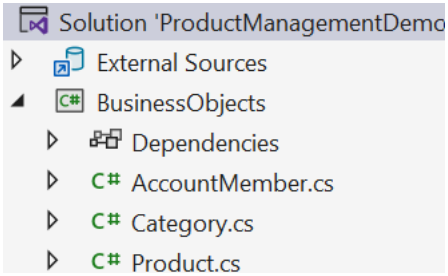
- Implement ORM

  dotnet ef dbcontext scaffold "**Server=(local); Database=MyStore; Uid=sa; Pwd=1234567890**" Microsoft.EntityFrameworkCore.SqlServer --output-dir ./

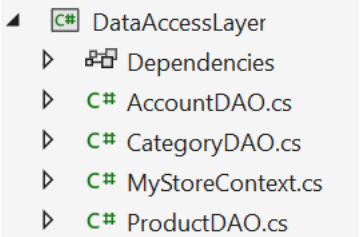
- Change the connection string in OnConfiguring() function of MyStoreContext.cs

```
using System.IO;
using Microsoft.Extensions.Configuration.Json;

private string GetConnectionString()
{
        IConfiguration configuration = new ConfigurationBuilder()
                .SetBasePath(Directory.GetCurrentDirectory())
                .AddJsonFile("appsettings.json", true, true).Build();
        return configuration["ConnectionStrings:DefaultConnectionString"];
}

protected override void OnConfiguring(DbContextOptionsBuilder optionsBuilder)
{
        optionsBuilder.UseSqlServer(GetConnectionString());

}
```

- Move the MyStoreContext.cs to DataAccessLayer Project



Activity 03: Write codes for the DataAccessLayer project



Step 01. On the **DataAccessLayer** project, add a class named **CategoryDAO.cs** and write codes as follows:

```
using System;
using System.Collections.Generic;
using System.Linq;
using BusinessObjects;

namespace DataAccessLayer
{
    1 reference
    public class CategoryDAO
    {
        1 reference
        public static List<Category> GetCategories()
        {
            var listCategories = new List<Category>();
            try
            {
                using var context = new MyStoreContext();
                listCategories = context.Categories.ToList();
            }
            catch (Exception e)
            {
                throw new Exception(e.Message);
            }
            return listCategories;
        }
    }
}
```

Step 02. On the **DataAccessLayer** project, add a class named **ProductDAO.cs** and write codes as follows:

```
1   using BusinessObjects;
2   using System;
3   using System.Collections.Generic;
4   using System.Linq;
5
6
7   namespace DataAccessLayer
8   {
        5 references
9       public class ProductDAO
10      {
            1 reference
11          public static List<Product> GetProducts()...
23
            1 reference
24          public static void SaveProduct(Product p)...
38
            1 reference
39          public static void UpdateProduct(Product p)...
52
            1 reference
53          public static void DeleteProduct(Product p)...
68
            1 reference
69          public static Product GetProductById(int id)...
75      }
76  }
```

The details of functions in ProductDAO.cs:

```
11          public static List<Product> GetProducts()
12          {
13              var listProducts = new List<Product>();
14              try
15              {
16                  using var db = new MyStoreContext();
17                  listProducts = db.Products.ToList();
18              }
19              catch (Exception e) { }
20
21              return listProducts;
22          }
```

```
24      public static void SaveProduct(Product p)
25      {
26          try
27          {
28              using var context = new MyStoreContext();
29              context.Products.Add(p); // Add to Product collection
30              context.SaveChanges(); // Update Database
31          }
32          catch (Exception e)
33          {
34
35              throw new Exception(e.Message);
36          }
37      }
```

```
39      public static void UpdateProduct(Product p)
40      {
41          try
42          {
43              using var context = new MyStoreContext();
44              context.Entry<Product>(p).State
45                  = Microsoft.EntityFrameworkCore.EntityState.Modified;
46              context.SaveChanges();
47          }
48          catch (Exception e)
49          {
50              throw new Exception(e.Message);
51          }
52      }
```

```
54      public static void DeleteProduct(Product p)
55      {
56          try
57          {
58              using var context = new MyStoreContext();
59              var p1 =
60                  context.Products.SingleOrDefault(c => c.ProductId == p.ProductId);
61              context.Products.Remove(p1);
62
63              context.SaveChanges();
64          }
65          catch (Exception e)
66          {
67              throw new Exception(e.Message);
68          }
69      }
```

```
        public static Product GetProductById(int id)
        {
            using var db = new MyStoreContext();
            return db.Products.FirstOrDefault(c => c.ProductId.Equals(id));

        }
    }
```

Step 03. Write codes for **AccountDAO.cs** as follows:

```
using BusinessObjects;
using System.Linq;

namespace DataAccessLayer
{
    1 reference
    public class AccountDAO
    {
        1 reference
        public static AccountMember GetAccountById(string accountID)
        {
            using var db = new MyStoreContext();
            return
                db.AccountMembers.FirstOrDefault(c=>c.MemberId.Equals(accountID));
        }
    }
}
```

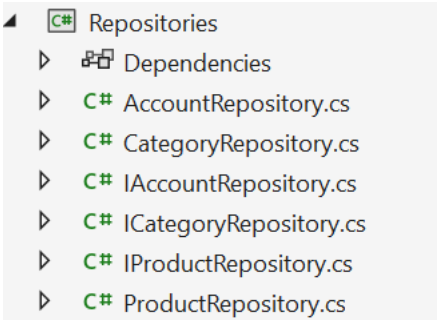
Step 04. The codes for **MyStoreContext.cs**:

```
1   using System.IO;
2   using Microsoft.EntityFrameworkCore;
3   using Microsoft.Extensions.Configuration;
4   using BusinessObjects;
5
6   namespace DataAccessLayer
7   {
        10 references
8       public partial class MyStoreContext : DbContext
9       {
            7 references
10          public MyStoreContext()...
            0 references
13          public MyStoreContext(DbContextOptions<MyStoreContext> options)...
            1 reference
17          public virtual DbSet<AccountMember> AccountMembers { get; set; } = null!;
            1 reference
18          public virtual DbSet<Category> Categories { get; set; } = null!;
            5 references
19          public virtual DbSet<Product> Products { get; set; } = null!;
            0 references
20          protected override void OnConfiguring(DbContextOptionsBuilder optionsBuilder)
            1 reference
28          string GetConnectionString()...
            0 references
36          protected override void OnModelCreating(ModelBuilder modelBuilder)...
            1 reference
84          partial void OnModelCreatingPartial(ModelBuilder modelBuilder);
85      }
86  }
```

The details for GetConnectionString() and OnConfiguring() functions

```
20          protected override void OnConfiguring(DbContextOptionsBuilder optionsBuilder)
21          {
22              if (!optionsBuilder.IsConfigured)
23              {
24  #warning To protect potentially sensitive information in your connection string, you s
25                  optionsBuilder.UseSqlServer(GetConnectionString());
26              }
27          }
            1 reference
28          string GetConnectionString()
29          {
30              IConfiguration config = new ConfigurationBuilder()
31                  .SetBasePath(Directory.GetCurrentDirectory())
32                  .AddJsonFile("appsettings.json").Build();
33              return config["ConnectionStrings:MyStockDB"];
34
35          }
```

Activity 04: Write codes for the Repositories project



Step 01. On the **Repositories** project, add an interface named **ICatergoryRepository.cs** and write codes as follows:

```
using System.Collections.Generic;
using BusinessObjects;

namespace Repositories
{
    2 references
    public interface ICategoryRepository
    {
        2 references
        List<Category> GetCategories();
    }
}
```

Step 02. On the **Repositories** project, add an interface named **IProductRepository.cs** and write codes as follows:

```
using System.Collections.Generic;
using BusinessObjects;

namespace Repositories
{
    2 references
    public interface IProductRepository
    {
        2 references
        void SaveProduct(Product p);
        2 references
        void DeleteProduct(Product p);
        2 references
        void UpdateProduct(Product p);
        2 references
        List<Product> GetProducts();
        2 references
        Product GetProductById(int id);
    }
}
```

Step 03. On the **Repositories** project, add an interface named **IAccountRepository.cs** and write codes as follows:

```
using BusinessObjects;

namespace Repositories
{
    2 references
    public interface IAccountRepository
    {
        2 references
        AccountMember GetAccountById(string accountID);
    }
}
```

Step 04. Write codes for class **CategoryRepository.cs** as follows:

```
using System.Collections.Generic;
using BusinessObjects;
using DataAccessLayer;

namespace Repositories
{
    1 reference
    public class CategoryRepository : ICategoryRepository
    {
        2 references
        public List<Category> GetCategories() => CategoryDAO.GetCategories();
    }
}
```

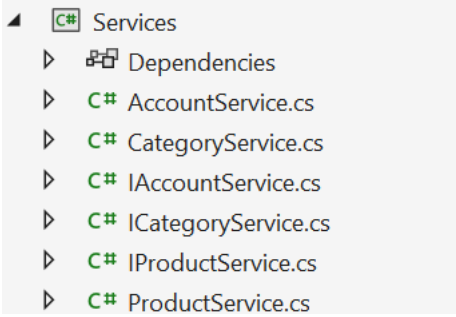
Step 05. Write codes for class **ProductRepository.cs** as follows:

```
using BusinessObjects;
using System.Collections.Generic;
using DataAccessLayer;

namespace Repositories
{
    1 reference
    public class ProductRepository : IProductRepository
    {
        2 references
        public void DeleteProduct(Product p) => ProductDAO.DeleteProduct(p);
        2 references
        public void SaveProduct(Product p) => ProductDAO.SaveProduct(p);
        2 references
        public void UpdateProduct(Product p) => ProductDAO.UpdateProduct(p);
        2 references
        public List<Product> GetProducts() => ProductDAO.GetProducts();
        2 references
        public Product GetProductById(int id)=>ProductDAO.GetProductById(id);

    }
}
```

Step 06. Write codes for class **AccountRepository.cs** as follows:

```
using BusinessObjects;
using DataAccessLayer;

namespace Repositories
{
    1 reference
    public class AccountRepository : IAccountRepository
    {
        2 references
        public AccountMember GetAccountById(string accountID)
            =>AccountDAO.GetAccountById(accountID);

    }
}
```

Activity 05: Write codes for the Services project



Step 01. On the **Services** project, add an interface named **ICatergoryService.cs** and write codes as follows:

```
using BusinessObjects;
using System.Collections.Generic;
namespace Services
{
    2 references
    public interface ICategoryService
    {
        2 references
        List<Category> GetCategories();
    }
}
```

Step 02. On the **Services** project, add an interface named **IProductService.cs** and write codes as follows:

```
using BusinessObjects;
using System.Collections.Generic;
namespace Services
{
    2 references
    public interface IProductService
    {
        2 references
        void SaveProduct(Product p);
        2 references
        void DeleteProduct(Product p);
        2 references
        void UpdateProduct(Product p);
        2 references
        List<Product> GetProducts();
        2 references
        Product GetProductById(int id);
    }
}
```

Step 03. On the **Services** project, add an interface named **IAccountService.cs** and write codes as follows:

```
using BusinessObjects;

namespace Services
{
    2 references
    public interface IAccountService
    {
        2 references
        AccountMember GetAccountById(string accountID);
    }
}
```

Step 04. Write codes for class **CategoryService.cs** as follows:

```
using System.Collections.Generic;
namespace Services
{
    2 references
    public class CategoryService : ICategoryService
    {
        private readonly ICategoryRepository iCategoryRepository;

        1 reference
        public CategoryService()
        {
            iCategoryRepository = new CategoryRepository();
        }

        2 references
        public List<Category> GetCategories()
        {
            return iCategoryRepository.GetCategories();
        }
    }
}
```

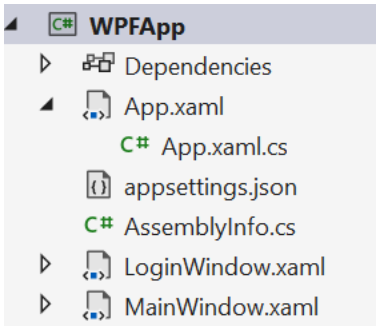
Step 05. Write codes for class **ProductService.cs** as follows:

```
using BusinessObjects;
using Repositories;
using System.Collections.Generic;

namespace Services
{
    2 references
    public class ProductService : IProductService
    {
        private readonly IProductRepository iProductRepository;

        1 reference
        public ProductService()
        {
            iProductRepository = new ProductRepository();
        }
        2 references
        public void DeleteProduct(Product p)
        {
            iProductRepository.DeleteProduct(p);
        }

        2 references
        public Product GetProductById(int id)
        {
            return iProductRepository.GetProductById(id);
        }

        2 references
        public List<Product> GetProducts()
        {
            return iProductRepository.GetProducts();
        }

        2 references
        public void SaveProduct(Product p)
        {
            iProductRepository.SaveProduct(p);
        }

        2 references
        public void UpdateProduct(Product p)
        {
            iProductRepository.UpdateProduct(p);
        }
    }
}
```

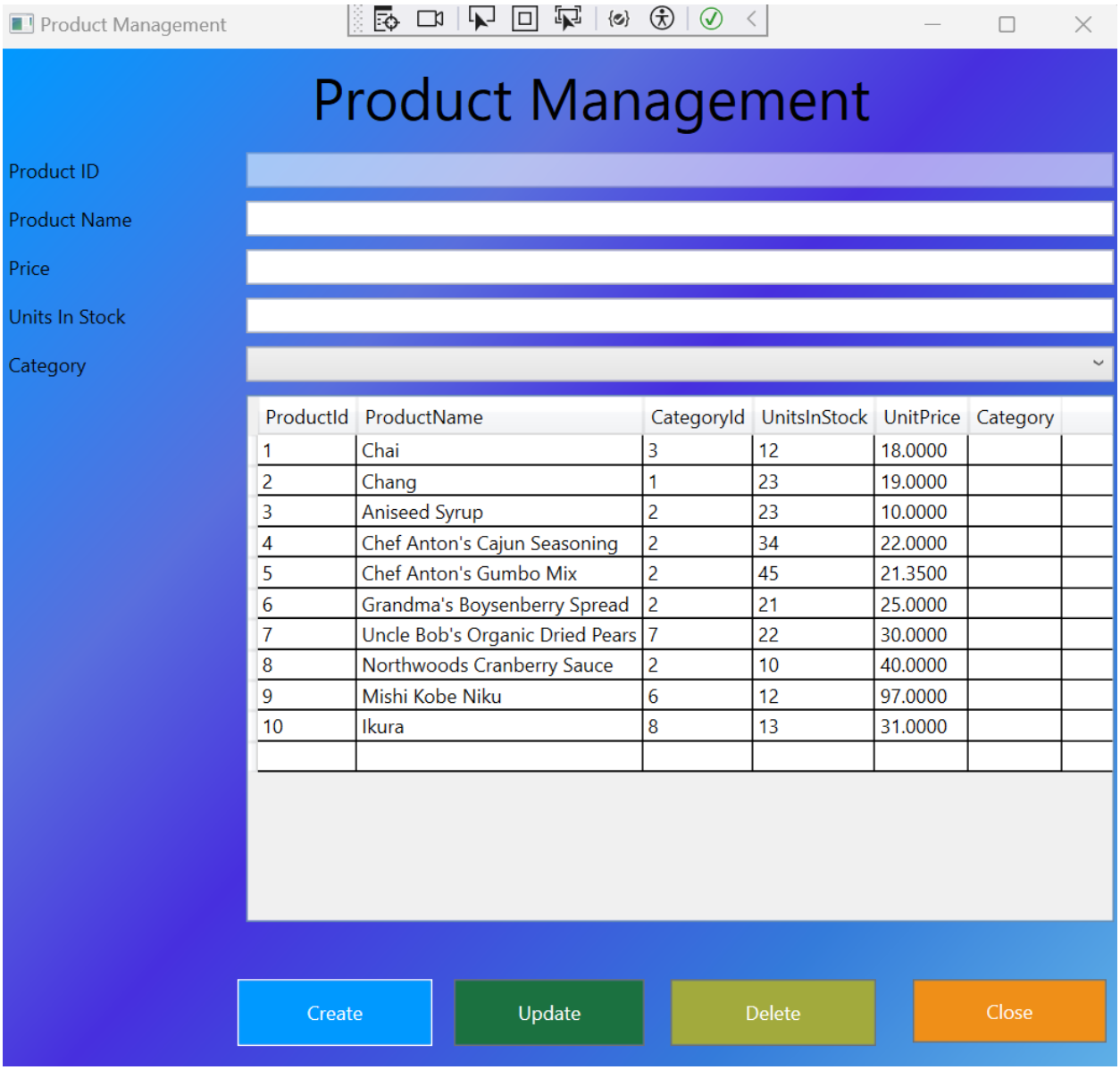
Step 06. Write codes for class **AccountService.cs** as follows:

```
using BusinessObjects;
using Repositories;

namespace Services
{
    2 references
    public class AccountService : IAccountService
    {
        private readonly IAccountRepository iAccountRepository;
        1 reference
        public AccountService() {
            iAccountRepository = new AccountRepository();
        }
        2 references
        public AccountMember GetAccountById(string accountID)
        {
            return iAccountRepository.GetAccountById(accountID);
        }
    }
}
```

Activity 04: Design UI and write codes for WPF project



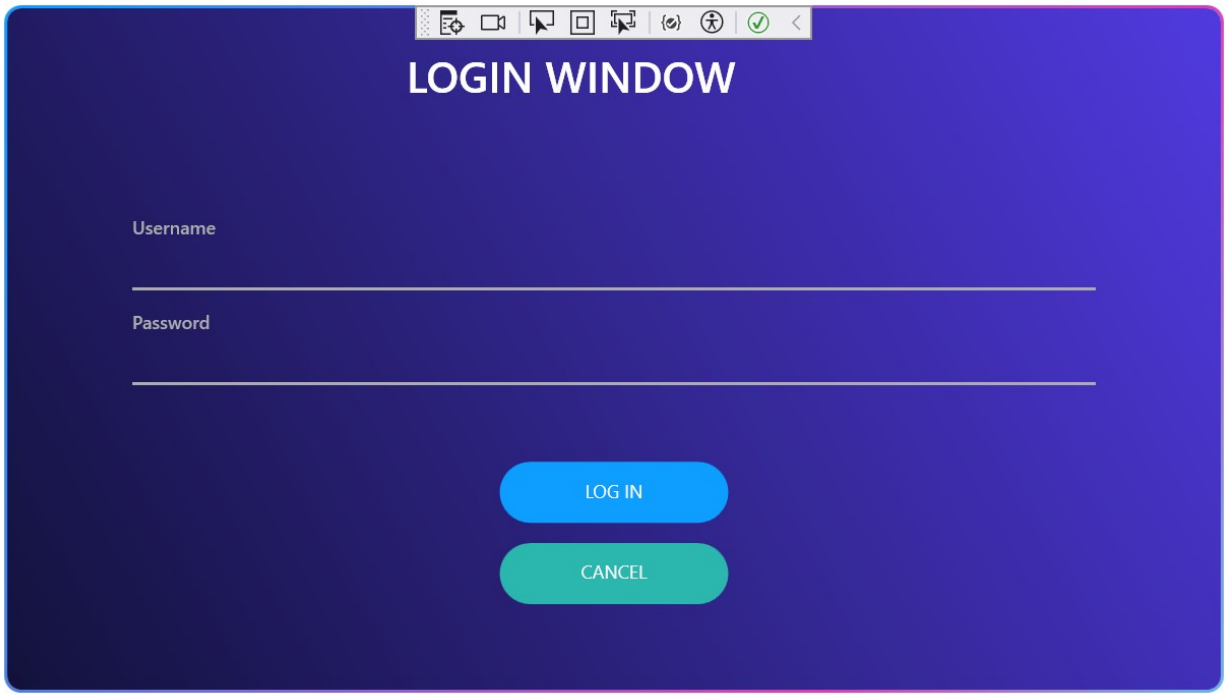
Step 01. On the **WPF** project, design UI as follows**:**



- **XAML** code for MainWindow.xaml

```
<Window x:Class="WPFApp.MainWindow"
        xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
        xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
        xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
        xmlns:mc="http://schemas.openxmlformats.org/markup-
compatibility/2006"
        xmlns:local="clr-namespace:WPFApp"
        mc:Ignorable="d"
        Loaded="Window_Loaded"
        WindowStartupLocation="CenterScreen"
        Title="Product Management" Height="670" Width="710">
    <Grid>
        <Grid>
            <Grid.Background>
                <LinearGradientBrush StartPoint="0,0" EndPoint="1,1">
                    <GradientStop Color="#0099FF" Offset="0"/>
                    <GradientStop Color="#FF347BDA" Offset="0.794"/>
                    <GradientStop Color="#FF60B1E7" Offset="1"/>
                    <GradientStop Color="#FF596FDD" Offset="0.309"/>
                    <GradientStop Color="#FF472FDE" Offset="0.484"/>
                </LinearGradientBrush>
            </Grid.Background>
            <Grid.RowDefinitions>
                <RowDefinition Height="60"/>
                <RowDefinition Height="30"/>
                <RowDefinition Height="30"/>
                <RowDefinition Height="30"/>
                <RowDefinition Height="30"/>
                <RowDefinition Height="30"/>
                <RowDefinition Height="*"/>
                <RowDefinition Height="30"/>
            </Grid.RowDefinitions>

            <Grid.ColumnDefinitions>
                <ColumnDefinition Width="119.415"/>
                <ColumnDefinition Width="30.585"/>
                <ColumnDefinition Width="47*"/>
                <ColumnDefinition Width="513*"/>
            </Grid.ColumnDefinitions>

            <Label x:Name="label" Content="Product Management"
Grid.Column="2" Grid.Row="0" FontSize="36" Grid.ColumnSpan="2"
HorizontalAlignment="Center" Width="466"/>

            <Label x:Name="label1" Margin ="2,2,2,2"  Content="Product ID"
Grid.Column="0" Grid.Row="1" Grid.ColumnSpan="2"/>
            <TextBox x:Name="txtProductID" Margin ="4,4,4,4" Grid.Column="2"
Grid.Row="1" Text="" TextWrapping="Wrap" Grid.ColumnSpan="2"
IsEnabled="False" />
```

```
            <Label x:Name="label2" Margin ="2,2,2,2" Grid.Column="0"
Grid.Row="2" Content="Product Name" Grid.ColumnSpan="2" />
            <TextBox x:Name="txtProductName" Margin ="4,4,4,4"
Grid.Column="2" Grid.Row="2" Text="" TextWrapping="Wrap" Grid.ColumnSpan="2"
/>

            <Label x:Name="label8" Margin ="2,2,2,2" Content="Price"
Grid.Column="0" Grid.Row="3" Grid.ColumnSpan="2"/>
            <TextBox x:Name="txtPrice"  Margin ="4,4,4,4" Grid.Column="2"
Grid.Row="3" Text="" TextWrapping="Wrap" Grid.ColumnSpan="2" />

            <Label x:Name="label3" Margin ="2,2,2,2" Content="Units In
Stock" Grid.Column="0" Grid.Row="4" Grid.ColumnSpan="2"/>
            <TextBox x:Name="txtUnitsInStock" Margin ="4,4,4,4"
Grid.Column="2" Grid.Row="4"  Text="" TextWrapping="Wrap"
Grid.ColumnSpan="2" />

            <Label x:Name="label4" Margin ="2,2,2,2" Content="Category"
Grid.Column="0" Grid.Row="5" Grid.ColumnSpan="2"/>
            <ComboBox x:Name="cboCategory" Margin ="4,4,4,4" Grid.Column="2"
Grid.Row="5" Grid.ColumnSpan="2" />


            <DataGrid x:Name="dgData" Margin ="4,4,4,63" Grid.Column="2"
Grid.Row="6" Grid.ColumnSpan="2" SelectionChanged="dgData_SelectionChanged"
/>
            <Button  x:Name="btnCreate" Content="Create"
HorizontalAlignment="Left" Margin="29,365,0,16" Grid.Row="6"
Grid.RowSpan="2" Width="121"  Background="#FF0099FF" BorderBrush="White"
Foreground="White" Grid.ColumnSpan="3" Grid.Column="1"
Click="btnCreate_Click"/>
            <Button x:Name="btnUpdate" Content="Update" Grid.Column="3"
HorizontalAlignment="Left" Margin="87,365,0,16" Grid.Row="6" Width="118"
Background="#FF1B7140" Foreground="White" Grid.RowSpan="2"
RenderTransformOrigin="0.37,0.2" Click="btnUpdate_Click"/>
            <Button x:Name="btnDelete" Content="Delete" Grid.Column="3"
HorizontalAlignment="Left" Margin="221,365,0,16" Grid.Row="6"
Grid.RowSpan="2" Width="127" Foreground="White" Background="#FFA2AA3D"
Click="btnDelete_Click"/>

            <Button x:Name="btnClose" Content="Close" Grid.Column="3"
HorizontalAlignment="Left" Margin="371,365,0,18" Grid.Row="6"
Grid.RowSpan="2" Width="120" Background="#FFEF8F18" Foreground="White"
Click="btnClose_Click"/>

        </Grid>
    </Grid>
</Window>
```




```
<Window x:Class="WPFApp.LoginWindow"
        xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
        xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
        xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
        xmlns:mc="http://schemas.openxmlformats.org/markup-
compatibility/2006"
        xmlns:local="clr-namespace:WPFApp"
        mc:Ignorable="d"
        Title="LoginWindow" Height="450" Width="800"
        WindowStartupLocation="CenterScreen"
        WindowStyle="None"
        Background="Transparent"
        AllowsTransparency="True">
    <Grid>
        <Border CornerRadius="10"
        BorderThickness="2"
        Opacity="0.95">
            <Border.BorderBrush>
                <LinearGradientBrush StartPoint="0,0" EndPoint="1,1">
                    <GradientStop Color="#0099FF" Offset="0"/>
                    <GradientStop Color="#DA34AE" Offset="0.75"/>
                    <GradientStop Color="#FF60B1E7" Offset="1"/>
                    <GradientStop Color="#FF596FDD" Offset="0.309"/>
                    <GradientStop Color="#FF8C57CA" Offset="0.484"/>
                </LinearGradientBrush>
            </Border.BorderBrush>
            <Border.Background>
                <LinearGradientBrush StartPoint="0,1" EndPoint="1,0">
                    <GradientStop Color="#060531" Offset="0"/>
                    <GradientStop Color="#FF472FDE" Offset="1"/>
```

```
                </LinearGradientBrush>
            </Border.Background>

            <Grid>
                <StackPanel Orientation="Horizontal"
  HorizontalAlignment="Center"
   Height="82" VerticalAlignment="Top" Width="632">
                    <TextBlock Text="LOGIN WINDOW"
 Foreground="White"
 FontSize="28"
 FontWeight="Medium"
 FontFamily="Montserrat"
 Cursor="Hand"
 Margin="180,30,0,0" Width="377"
/>
                </StackPanel>
                <StackPanel
                        Orientation="Vertical"
                        Margin="82,102,82,68">
                    <TextBlock Text="Username"
                           Foreground="DarkGray"
                           FontSize="12"
                           FontWeight="Medium"
                           FontFamily="Montserrat"
                           Margin="0,35,0,0"/>
                    <TextBox x:Name="txtUser"
                         FontSize="13"
                         FontWeight="Medium"
                         FontFamily="Montserrat"
                         Foreground="White"
                         CaretBrush="LightGray"
                         BorderBrush="DarkGray"
                         BorderThickness="0,0,0,2"
                         Height="28"
                         VerticalContentAlignment="Center"
                         Margin="0,5,0,0"
                         >
                        <TextBox.Background>
                            <LinearGradientBrush></LinearGradientBrush>
                        </TextBox.Background>
                    </TextBox>

                    <TextBlock Text="Password"
                           Foreground="DarkGray"
                           FontSize="12"
                           FontWeight="Medium"
                           FontFamily="Montserrat"
                           Margin="0,15,0,0"/>
                    <PasswordBox x:Name="txtPass"
                         FontSize="13"
                         FontWeight="Medium"
                         FontFamily="Montserrat"
                         Foreground="White"
```

```
                            CaretBrush="LightGray"
                            BorderBrush="DarkGray"
                            BorderThickness="0,0,0,2"
                            Height="28"
                            VerticalContentAlignment="Center"
                            Margin="0,5,0,0">
                        <PasswordBox.Background>
                            <LinearGradientBrush></LinearGradientBrush>
                        </PasswordBox.Background>
                    </PasswordBox>
                    <Button x:Name="btnLogin"
                        BorderThickness="0"
                        Content="LOG IN"
                        Foreground="White"
                        FontSize="12"
                        FontFamily="Montserrat"
                        Cursor="Hand"
                        Margin="0,50,0,0"
                        Click="btnLogin_Click">
                        <Button.Style>
                            <Style TargetType="Button">
                                <Setter Property="Background"
Value="#0099FF"/>
                                <Style.Triggers>
                                    <Trigger Property="IsMouseOver"
Value="True">
                                        <Setter Property="Background"
Value="#28AEED"/>
                                    </Trigger>
                                </Style.Triggers>
                            </Style>
                        </Button.Style>
                        <Button.Template>
                            <ControlTemplate TargetType="Button">
                                <Border Width="150" Height="40"
                                    CornerRadius="20"
                                    Background="{TemplateBinding
Background}">
                                    <ContentPresenter
VerticalAlignment="Center"
HorizontalAlignment="Center"/>
                                </Border>
                            </ControlTemplate>
                        </Button.Template>


                    </Button>


                </StackPanel>
                <StackPanel>
                    <Button x:Name="btnCancel"
```

```
BorderThickness="0"
Content="CANCEL"
Foreground="White"
FontSize="12"
FontFamily="Montserrat"
Cursor="Hand"
Margin="20,350,20,0"
Click="btnCancel_Click">
                        <Button.Style>
                            <Style TargetType="Button">
                                <Setter Property="Background"
Value="LightSeaGreen"/>
                                <Style.Triggers>
                                    <Trigger Property="IsMouseOver"
Value="True">
                                        <Setter Property="Background"
Value="SeaGreen"/>
                                    </Trigger>
                                </Style.Triggers>
                            </Style>
                        </Button.Style>
                        <Button.Template>
                            <ControlTemplate TargetType="Button">
                                <Border Width="150" Height="40"
            CornerRadius="20"
            Background="{TemplateBinding Background}">
                                    <ContentPresenter
VerticalAlignment="Center"
                          HorizontalAlignment="Center"/>
                                </Border>
                            </ControlTemplate>
                        </Button.Template>


                    </Button>

                </StackPanel>

            </Grid>

        </Border>
    </Grid>
</Window>
```

Step 02. Right-click on the project | Add | New Item, select **JavaScript JSON Configuration File** then rename to **appsettings.json**, click Add and write contents as follows:

```
{
  "ConnectionStrings": {
    "MyStockDB": "Server=(local);uid=sa;pwd=1234567890;database=MyStore;"
  }
```

```
}
```

Next, right-click on **appsettings.json** | Properties, select ***Copy if newer***

Step 03. Add a reference to the WPF project to Services Project

Step 04. Write codes for LoginWindow.xaml.cs:

```
using BusinessObjects;
using Services;
using System.Windows;

namespace WPFApp
{
    /// <summary> Interaction logic for LoginWindow.xaml
    2 references
    public partial class LoginWindow : Window
    {
        private readonly IAccountService iAccountService;
        0 references
        public LoginWindow()
        {
            InitializeComponent();
            iAccountService = new AccountService();
        }

        1 reference
        private void btnLogin_Click(object sender, RoutedEventArgs e)...

        1 reference
        private void btnCancel_Click(object sender, RoutedEventArgs e)
        {
            this.Close();
        }
    }
}
```

The details for btnLogin_Click() function:

```
19          private void btnLogin_Click(object sender, RoutedEventArgs e)
20          {
21              AccountMember account = iAccountService.GetAccountById(txtUser.Text);
22              if (account != null && account.MemberPassword.Equals(txtPass.Password)
23                  && account.MemberRole == 1)
24              {
25                  this.Hide();
26                  MainWindow mainWindow = new MainWindow();
27                  mainWindow.Show();
28
29              }
30              else
31              {
32                  MessageBox.Show("You are not permission !");
33              }
34          }
```

Step 05. Write codes for MainWindow.xaml.cs:

```
1   using System;
2   using System.Windows;
3   using System.Windows.Controls;
4   using BusinessObjects;
5   using Services;
6
7   namespace WPFApp
8   {
9       /// <summary> Interaction logic for MainWindow.xaml
        5 references
12      public partial class MainWindow : Window
13      {
14          private readonly IProductService iProductService;
15          private readonly ICategoryService iCategoryService;
            1 reference
16          public MainWindow()...
            1 reference
22          public void LoadCategoryList()...
            4 references
37          public void LoadProductList()...
            1 reference
53          private void Window_Loaded(object sender, RoutedEventArgs e)...
            1 reference
58          private void btnCreate_Click(object sender, RoutedEventArgs e)...
            1 reference
78          private void dgData_SelectionChanged(object sender, SelectionChangedEventArgs e)
            1 reference
91          private void btnClose_Click(object sender, RoutedEventArgs e)...
            1 reference
95          private void btnUpdate_Click(object sender, RoutedEventArgs e)...
            1 reference
124         private void btnDelete_Click(object sender, RoutedEventArgs e)...
            1 reference
154         private void resetInput()...
162     }
163 }
```

The functions in details:

```
16      public MainWindow()
17      {
18          InitializeComponent();
19          iProductService = new ProductService();
20          iCategoryService = new CategoryService();
21      }
        1 reference
22      public void LoadCategoryList()
23      {
24          try
25          {
26              var catList = iCategoryService.GetCategories();
27              cboCategory.ItemsSource = catList;
28              cboCategory.DisplayMemberPath = "CategoryName";
29              cboCategory.SelectedValuePath = "CategoryId";
30
31          }
32          catch (Exception ex)
33          {
34              MessageBox.Show(ex.Message, "Error on load list of categories");
35          }
36      }
```

```
37      public void LoadProductList()
38      {
39          try
40          {
41              var productList = iProductService.GetProducts();
42              dgData.ItemsSource = productList;
43          }
44          catch (Exception ex)
45          {
46             // MessageBox.Show(ex.Message, "Error on load list of products");
47          }
48          finally
49          {
50              resetInput();
51          }
52      }
        1 reference
53      private void Window_Loaded(object sender, RoutedEventArgs e)
54      {
55          LoadCategoryList();
56          LoadProductList();
57      }
```

```
58      private void btnCreate_Click(object sender, RoutedEventArgs e)
59      {
60          try
61          {
62              Product product = new Product();
63              product.ProductName = txtProductName.Text;
64              product.UnitPrice = Decimal.Parse(txtPrice.Text);
65              product.UnitsInStock = short.Parse(txtUnitsInStock.Text);
66              product.CategoryId = Int32.Parse(cboCategory.SelectedValue.ToString());
67              iProductService.SaveProduct(product);
68          }
69          catch (Exception ex)
70          {
71              MessageBox.Show(ex.Message);
72          }
73          finally
74          {
75              LoadProductList();
76          }
77      }

78      private void dgData_SelectionChanged(object sender, SelectionChangedEventArgs e)
79      {
80          DataGrid dataGrid = sender as DataGrid;
81          DataGridRow row =
82              (DataGridRow)dataGrid.ItemContainerGenerator
83              .ContainerFromIndex(dataGrid.SelectedIndex);
84          DataGridCell RowColumn =
85              dataGrid.Columns[0].GetCellContent(row).Parent as DataGridCell;
86          string id = ((TextBlock)RowColumn.Content).Text;
87          Product product = iProductService.GetProductById(Int32.Parse(id));
88          txtProductID.Text = product.ProductId.ToString();
89          txtProductName.Text = product.ProductName;
90          txtPrice.Text = product.UnitPrice.ToString();
91          txtUnitsInStock.Text = product.UnitsInStock.ToString();
92          cboCategory.SelectedValue = product.CategoryId;
93      }
        1 reference
94      private void btnClose_Click(object sender, RoutedEventArgs e)
95      {
96          this.Close();
97      }
```

```
98      private void btnUpdate_Click(object sender, RoutedEventArgs e)
99      {
100         try
101         {
102             if (txtProductID.Text.Length > 0)
103             {
104                 Product product = new Product();
105                 product.ProductId = Int32.Parse(txtProductID.Text);
106                 product.ProductName = txtProductName.Text;
107                 product.UnitPrice = Decimal.Parse(txtPrice.Text);
108                 product.UnitsInStock = short.Parse(txtUnitsInStock.Text);
109                 product.CategoryId = Int32.Parse(cboCategory.SelectedValue.ToString());
110                 iProductService.UpdateProduct(product);
111
112             }
113             else
114             {
115                 MessageBox.Show("You must select a Product !");
116             }
117         }
118         catch (Exception ex)
119         {
120             MessageBox.Show(ex.Message);
121         }
122         finally
123         {
124             LoadProductList();
125         }
126     }
```

```
127     private void btnDelete_Click(object sender, RoutedEventArgs e)
128     {
129         try
130         {
131             if (txtProductID.Text.Length > 0)
132             {
133                 Product product = new Product();
134                 product.ProductId = Int32.Parse(txtProductID.Text);
135                 product.ProductName = txtProductName.Text;
136                 product.UnitPrice = Decimal.Parse(txtPrice.Text);
137                 product.UnitsInStock = short.Parse(txtUnitsInStock.Text);
138                 product.CategoryId = Int32.Parse(cboCategory.SelectedValue.ToString());
139                 iProductService.DeleteProduct(product);
140
141             }
142             else
143             {
144                 MessageBox.Show("You must select a Product !");
145             }
146         }
147         catch (Exception ex)
148         {
149
150         }
151         finally
152         {
153
154             LoadProductList();
155         }
156     }
```

```
        private void resetInput()
        {
            txtProductID.Text = "";
            txtProductName.Text = "";
            txtPrice.Text = "";
            txtUnitsInStock.Text = "";
            cboCategory.SelectedValue = 0;
        }
    }
```

Step 06. Open App.xaml and then update XAML code as follows:

```
<Application x:Class="WPFApp.App"

xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
             xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
             xmlns:local="clr-namespace:WPFApp"
             StartupUri="LoginWindow.xaml">
    <Application.Resources>

    </Application.Resources>
</Application>
```

Activity 05: Run the WPFApp project and test all actions