Independent Data Layer and Separate UI

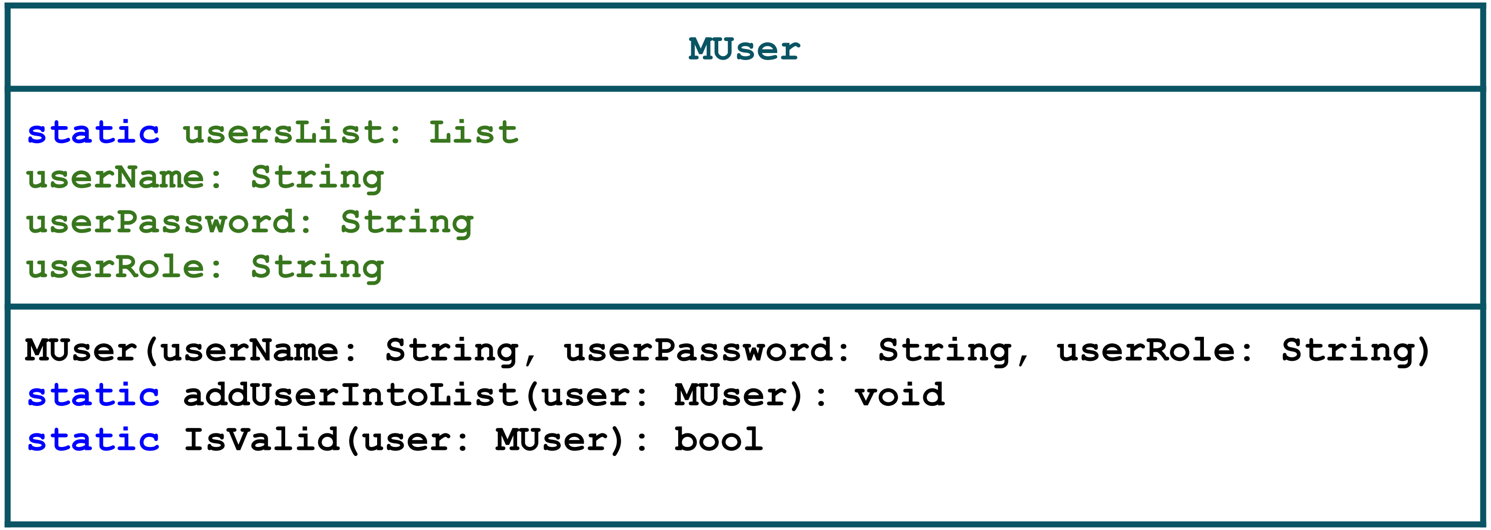
Revision: MUser

Previously, We have developed the MUser Class.

```
MUser
----------------------------------------------------------------------
static usersList: List
userName: String
userPassword: String
userRole: String
----------------------------------------------------------------------
MUser(userName: String, userPassword: String, userRole: String)
static addUserIntoList(user: MUser): void
static IsValid(user: MUser): bool
```

Multiple MUsers

Do you see any Problem with this?

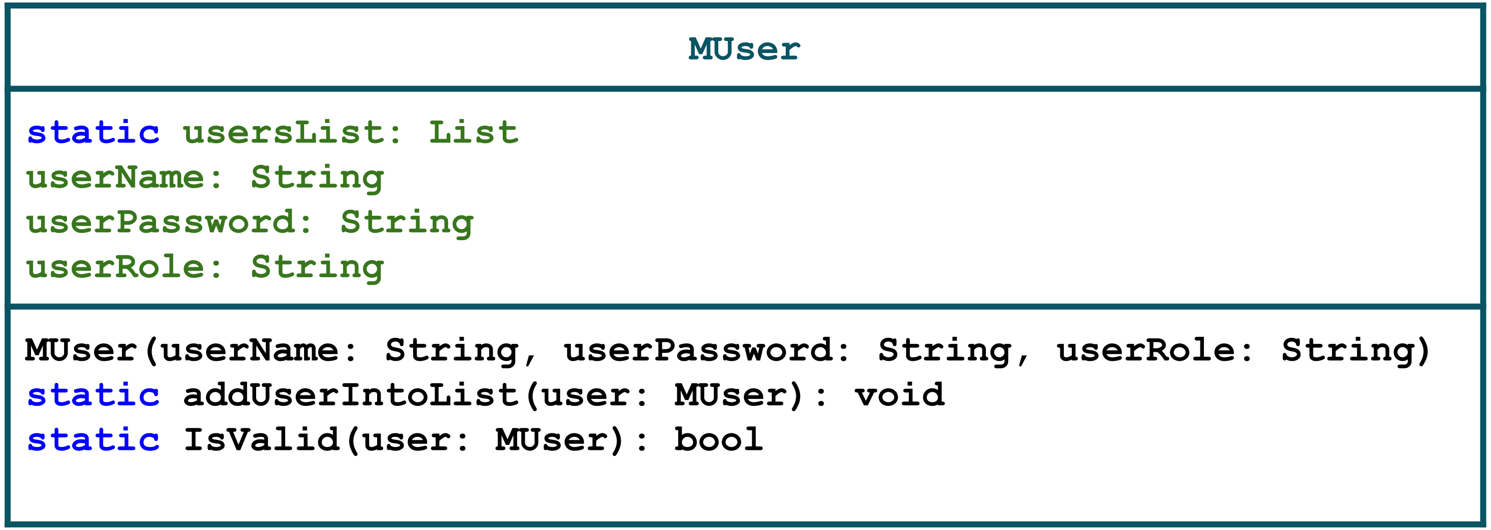


```
MUser
-----------------------------------------------------------------
static usersList: List
userName: String
userPassword: String
userRole: String
-----------------------------------------------------------------
MUser(userName: String, userPassword: String, userRole: String)
static addUserIntoList(user: MUser): void
static IsValid(user: MUser): bool
```

Multiple MUsers

The class is serving 2 purposes.

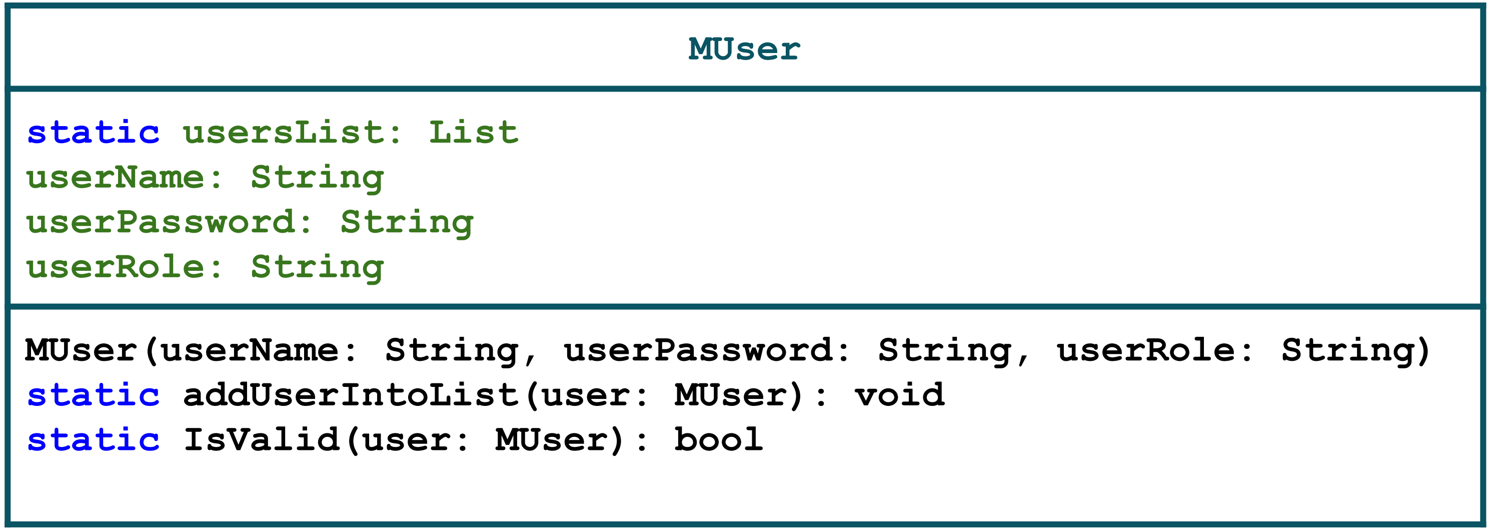
1. Representation of MUser information in SignIn System.
2. Providing CRUD operation for all user objects.



```
MUser
---
static usersList: List
userName: String
userPassword: String
userRole: String
---
MUser(userName: String, userPassword: String, userRole: String)
static addUserIntoList(user: MUser): void
static IsValid(user: MUser): bool
```

Multiple MUsers

We need to split this class into 2 classes such that MUser only represent the users (Business Logic) and second class should take care of the CRUD operations (Data Layer).



```
MUser
-----------------------------------------------------------------
static usersList: List
userName: String
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-----------------------------------------------------------------
MUser(userName: String, userPassword: String, userRole: String)
static addUserIntoList(user: MUser): void
static IsValid(user: MUser): bool
```
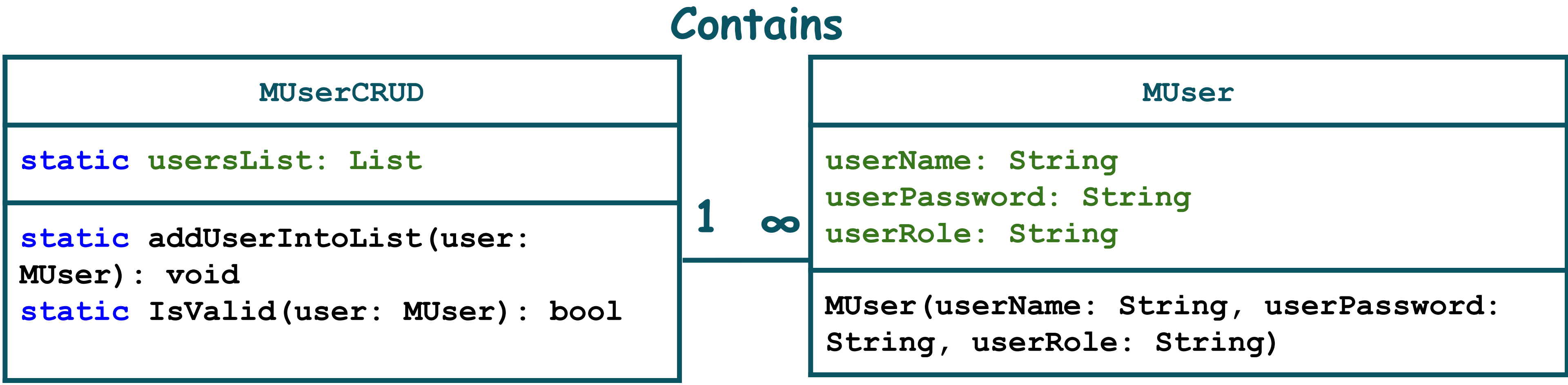
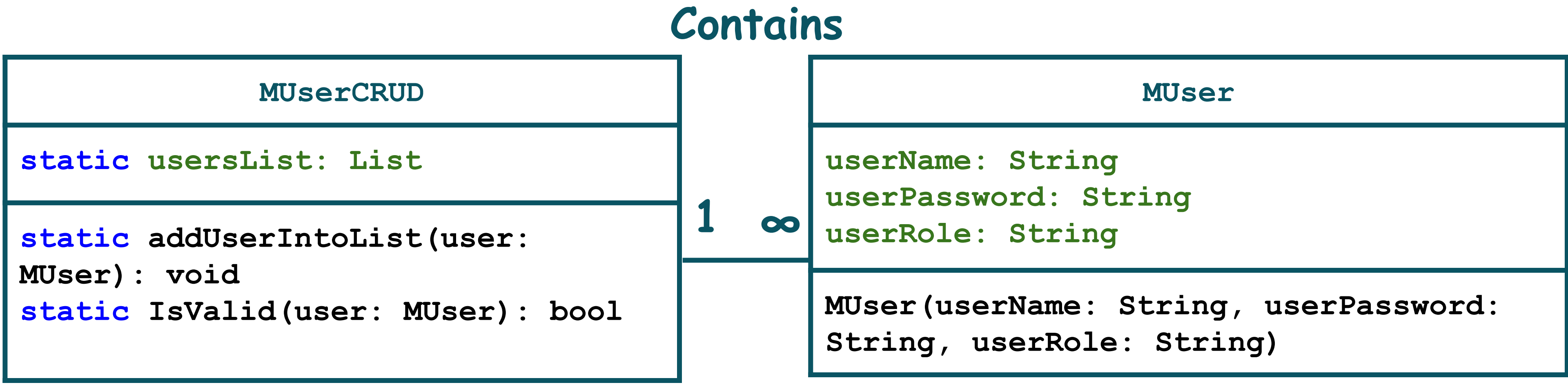

Multiple MUsers

One Possible model can be


Contains
MUserCRUD
static usersList: List
static addUserIntoList(user: MUser): void
static IsValid(user: MUser): bool
1
∞
MUser
userName: String
userPassword: String
userRole: String
MUser(userName: String, userPassword: String, userRole: String)

Multiple MUsers

Write Driver code that add new user using following model.



```
MUserCRUD
static usersList: List
static addUserIntoList(user:
MUser): void
static IsValid(user: MUser): bool
```

```
MUser
userName: String
userPassword: String
userRole: String
MUser(userName: String, userPassword:
String, userRole: String)
```

Add New User Code

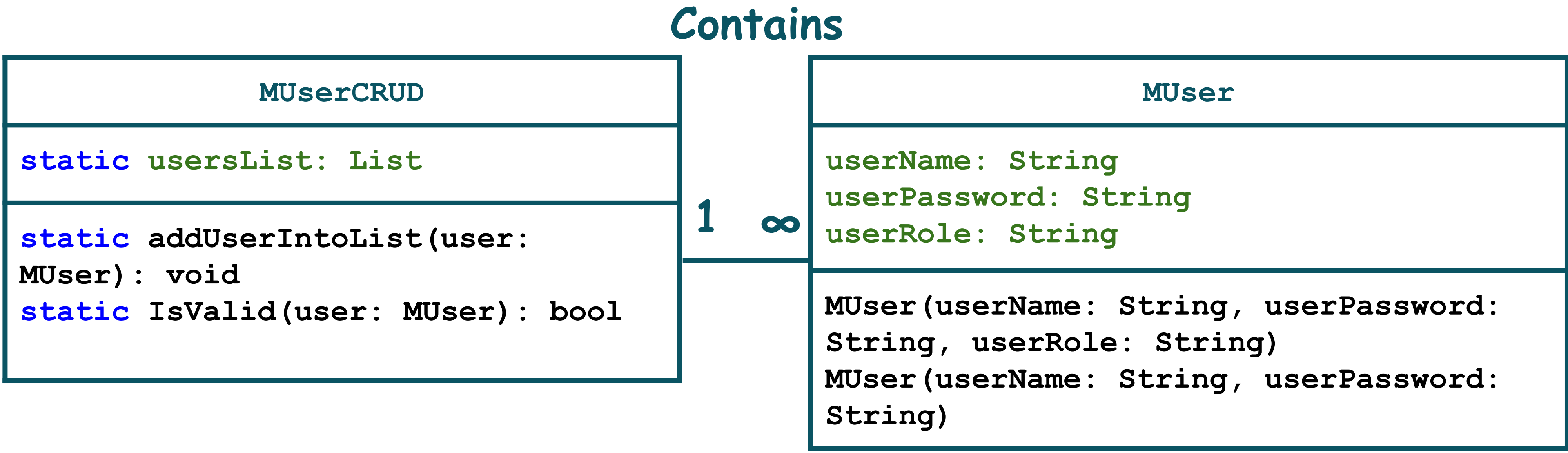
```
static MUser TakeInputFromConsole()
{
    console.WriteLine(“Enter User Name”);
    string userName = console.ReadLine();
    console.WriteLine(“Enter User Password”);
    string userPassword = console.ReadLine();
    console.WriteLine(“Enter User Role”);
    string userRole = console.ReadLine();
    MUser user = new MUser(userName, userPassword, userRole);
    return user;
}
```

Add New User Code

```
static void Main(string[] args)
{
    MUser user = TakeInputFromConsole();
    MUserCRUD.addUserIntoList(user);
}

static MUser TakeInputFromConsole()
{
    console.WriteLine("Enter User Name");
    string userName = console.ReadLine();
    console.WriteLine("Enter User Password");
    string userPassword = console.ReadLine();
    console.WriteLine("Enter User Role");
    string userRole = console.ReadLine();
    MUser user = new MUser(userName, userPassword, userRole);
    return user;
}
```

Multiple MUsers

Write Driver code that search user through the users List and shows its information on screen if it is valid using following model.


Contains
MUserCRUD
static usersList: List
static addUserIntoList(user: MUser): void
static IsValid(user: MUser): bool
1
∞
MUser
userName: String
userPassword: String
userRole: String
MUser(userName: String, userPassword: String, userRole: String)
MUser(userName: String, userPassword: String)

Show User Code

```
static MUser TakeInputwithOutRole()
{
    console.WriteLine("Enter User Name");
    string userName = console.ReadLine();
    console.WriteLine("Enter User Password");
    string userPassword = console.ReadLine();
    MUser user = new MUser(userName, userPassword);
    return user;
}
```

Show User Code

```
static void Main(string[] args)
{
    MUser user = TakeInputwithOutRole();
    bool check = MUserCRUD.isValid(user);
    if(check)
    {
        console.WriteLine("User Name is: " + user.userName);
    }
}

static MUser TakeInputwithOutRole()
{
    console.WriteLine("Enter User Name");
    string userName = console.ReadLine();
    console.WriteLine("Enter User Password");
    string userPassword = console.ReadLine();
    MUser user = new MUser(userName, userPassword);
    return user;
}
```

MUsers: Activity

Implement CLI based application that show two menus to user one is for 1) SignIn 2) SignUp. The user interface shall be in main class (program class) and it shall use the MUser for Business Logic and MUserCRUD model for Data Logic.

MUser

```
class MUser{
    string userName;
    string userPassword;
    string userRole;

    public MUser(string userName, string userPassword,
string userRole){
        //Code
    }

    public MUser(string userName, string userPassword){
        //Code
    }
    public string getUserName(){
        return userName;
    }
    public string getUserPassword(){
        return userPassword;
    }

    public string getUserRole(){
        return userRole;
    }
    public bool isAdmin()
    {
        //Code
    }
}
```

MUserCRUD

```
class MUserCRUD
{
    public static List<MUser> usersList = new List<MUser>();

    public static void addUserIntoList(MUser user)
    {
        usersList.Add(user);
    }

    public static MUser SignIn(MUser user)
    {
        // Code
    }

    public static string parseData(string record, int field)
    {
        // Code
    }

    public static void readDataFromFile(string path)
    {
        // Code
    }

    public static void storeUserIntoFile(MUser user, string path)
    {
        // Code
    }
}
```

Driver Program

```
static void Main(string[] args){
    string path = "Data.txt";
    MUserCRUD.readDataFromFile(path);
    int option = 0;
    while (option != 3){
        Console.Clear();
        option = menu();
        if (option == 1){
            MUser user = takeInputwithOutRole();
            user = MUserCRUD.SignIn(user);
            if (user != null){
                if (user.isAdmin()){
                    Console.WriteLine("This is Admin");
                    //Admin Menu
                }
                else{
                    Console.WriteLine("This is User");
                    //User Menu
                }
            }
        }
        else if (option == 2){
            MUser user = TakeInputFromConsole();
            MUserCRUD.addUserIntoList(user);
            MUserCRUD.storeUserIntoFile(user, path);
        }
        Console.ReadKey();
    }
}
```

Driver Program

```
static int menu()
{
    // Code
    return option;
}

static void printList()
{
    // Code
}

static MUser TakeInputFromConsole()
{
    // Code

    MUser user = new MUser(userName, userPassword,
userRole);
    return user;

}

static MUser takeInputwithOutRole()
{
    // Code
    MUser user = new MUser(userName, userPassword);
    return user;
}
```

MUsers: Activity Updated

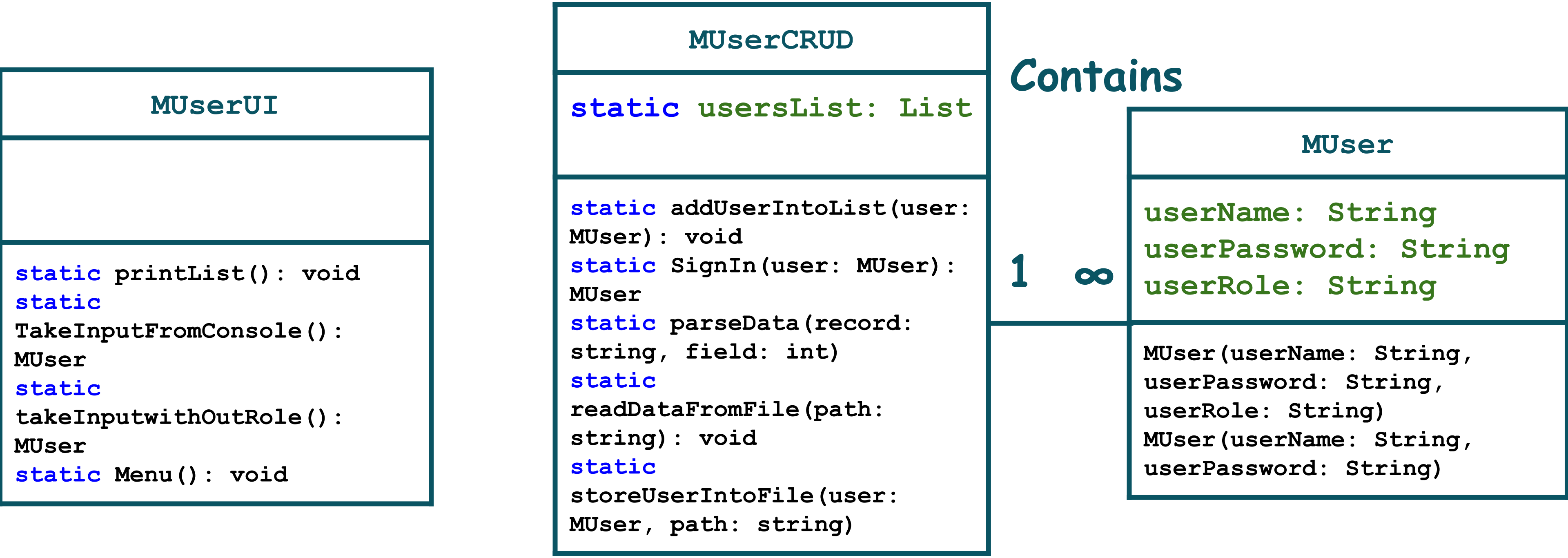
Implement CLI based application that show two menus to user one is for 1) SignIn 2) SignUp.
Now, we will make Three Classes (3 Tier Model)

1. MUser (BL)
2. MUserCRUD (DL)
3. MUserUI (UI)

Now, main program will only use the functions of these classes to implement the Application.

Multiple MUsers

Class Diagram with 3 Tier Model is



MUserUI
static printList(): void
static TakeInputFromConsole(): MUser
static takeInputwithOutRole(): MUser
static Menu(): void
MUserCRUD
static usersList: List
static addUserIntoList(user: MUser): void
static SignIn(user: MUser): MUser
static parseData(record: string, field: int)
static readDataFromFile(path: string): void
static storeUserIntoFile(user: MUser, path: string)
Contains
1
∞
MUser
userName: String
userPassword: String
userRole: String
MUser(userName: String, userPassword: String, userRole: String)
MUser(userName: String, userPassword: String)

MUser

```
class MUser{
    string userName;
    string userPassword;
    string userRole;

    public MUser(string userName, string userPassword,
string userRole){
        //Code
    }

    public MUser(string userName, string userPassword){
        //Code
    }
    public string getUserName(){
        return userName;
    }
    public string getUserPassword(){
        return userPassword;
    }

    public string getUserRole(){
        return userRole;
    }
    public bool isAdmin()
    {
        //Code
    }
}
```

MUserCRUD

```
class MUserCRUD
{
    public static List<MUser> usersList = new List<MUser>();

    public static void addUserIntoList(MUser user)
    {
        usersList.Add(user);
    }

    public static MUser SignIn(MUser user)
    {
        // Code
    }

    public static string parseData(string record, int field)
    {
        // Code
    }

    public static void readDataFromFile(string path)
    {
        // Code
    }

    public static void storeUserIntoFile(MUser user, string path)
    {
        // Code
    }
}
```

MUserUI

```java
public static int menu()
{
    //Code
    return option;
}

public static void printList()
{
    //Code
}

public static MUser TakeInputFromConsole()
{
    //Code
    return user;

}

public static MUser takeInputwithOutRole()
{
    //Code
    return user;
}
```

Driver Program

```
static void Main(string[] args){
    string path = "Data.txt";
    MUserCRUD.readDataFromFile(path);
    int option = 0;
    while (option != 3){
        Console.Clear();
        option = MUserUI.menu();
        if (option == 1){
            MUser user = MUserUI.takeInputwithOutRole();
            user = MUserCRUD.SignIn(user);
            if (user != null){
                if (user.isAdmin()){
                    Console.WriteLine("This is Admin");
                    //Admin Menu
                }
                else{
                    Console.WriteLine("This is User");
                    //User Menu
                }
            }
        }
        else if (option == 2){
            MUser user = MUserUI.TakeInputFromConsole();
            MUserCRUD.addUserIntoList(user);
            MUserCRUD.storeUserIntoFile(user, path);
        }
        Console.ReadKey();
    }
}
```

Learning Objective

Modify the Static Data Layer to Separate Data Layer and Write Separate UI for taking Input and displaying Output

Self Assessment:

1. Implement all the Scenarios with this 3 Tier Model.