Contents

Overview

A web based CRUD application for member demographic information. Following key features are implemented.

- Mobile Friendly CRUD App Using Bootstrap 3
- Desktop 4 Columns, Tablets 2 Columns & Phones 1 Column View
- Disabled Pinch & Zoom on Mobile Devices
- Code First Using Entity Framework 6
- Seeding Of Data
- Unit of Work and Repository Pattern
- Dependency Injection Using IOC Container - Ninject
- Handled Data Concurrency
- Automated Unit Testing Using Moq
- Automated Unit Integration Testing Using Fake Data
- Data Annotation
- Partial Views
- Editor Templates
- Global Error Handling
- CDN based js and css

Following Technology/software are used to develop this web application.

- Visual Studio 2013 Express
- SQL Server 2013 Express
- ASP.NET MVC 5
- .NET Framework 4.5
- Entity Framework 6.0
- Bootstrap 3.0
- JQuery

Project Setup

Open MVCDemo.sln solution file in Microsoft Visual Studio 2013 Express/Professional. Visual studio should load two projects which are part of this solution.

1. MVCDemo
2. MVCDemo.Tests

Database Connection:

Before you run the application**, change the connectionString** under `<connectionStrings>` section in the web.config file.

This web site will support only SQL Server database.

Compile and Run:

Within Solution Explorer, Right click on solution and select "Rebuild Solution" menu from popup menu. After successful compilation of solution, you can press F5 to run the web application.

This web site is designed using code first approach, so when you run and click on the Demographic menu very first time, system will build the database and also enter data for 10 members automatically for you. After that you can create additional new member or update existing member data.

What if you do not have SQL Server? :

Incase if you do not have SQL Server or due to some reason application is unable to create / connect to database server then you can bypass database and can still play with application and can experience the user interface.

There is a key called "**UseDatabase**" in the web.config under <`appSettings`> section. Default value for this key is set as **True**. You can set that key value to **false** and web site will run against in memory data. When it runs against in memory data, web site will NOT SAVE any of your change. You can navigate various pages and experience user interface but will not be able to create any new member record nor will be able to update any existing member record.

What if you can't build project/solution? :

If you do not have visual studio 2013 or if you can't compile project / solution then you can push the content available under the "Publish" folder to your web server and can run website from there. You can find "Publish" folder under the root directory.

Database

Table Name: Members
Description: Table to store member demographic information

Column Name	Description	Datatype	Width	Null and Other Constraints
MemberID	Primary Key, auto generated	Int		Not null
FirstName	Given name of the member	Varchar	50	Not null
LastName	Family name of the member	Varchar	50	Not null
RowVersion	Row version for concurrency management, SQL server does auto update on each update	Timestamp		Not null
CreatedBy	User id who created record	Varchar	20	Not null
CreateDateTime	Date time of record creation	Datetime		Not null
UpdatedBy	User id who updated record	Varchar	20	Not null
UpdateDateTime	Date time of record modification	Datetime		Not null

Table Name: Contacts
Description: Table to store member contact (i.e. address and email) information. To support multiple address (Home, Work, Provider etc…) separate table is created. Different types of addresses are filtered using ContactType column. Current application is developed only for Home address, but with this separate contact table application can be extended easily to support other type of address.

Column Name	Description	Datatype	Width	Null and Other Constraints
ContactID	Primary key, auto generated.	Int		Not null
MemberID	Member ID from Member table. Foreign key to member table	int		Not null
StateID	State ID from state table, Foreign key to state table.	Int		Not null
AddressLine1	Address line 1	Varchar	50	Not null
AddressLine2	Address line 2	Varchar	50	Null
City	City	Varchar	30	Not null
Zipcode	Zip code of the address. It can be either ##### or #####- ####	Varchar	10	Not null
Country	Country of address. In current implementation, web site will always saves country as USA	Varchar	30	Not null
Email	Email address of the member	Varchar	50	Not null
ContactType	To filter various type of address i.e. Home, Work , Provider etc.	Varchar	10	Not null

RowVersion	Row version for concurrency management, SQL server does auto update on each update	Timestamp		Not null
CreatedBy	User id who created record	Varchar	20	Not null
CreateDateTime	Date time of record creation	Datetime		Not null
UpdatedBy	User id who updated record	Varchar	20	Not null
UpdateDateTime	Date time of record modification	Datetime		Not null

Table Name: States
Description: This table contains list of all 50 US States.

Column Name	Description	Datatype	Width	Null and Other Constraints
StateID	2 letter state abbreviation	Varchar	2	Not null
StateName	Full name of the State	Varchar	25	Not null
RowVersion	Row version for concurrency management, SQL server does auto update on each update	Timestamp		Not null
CreatedBy	User id who created record	Varchar	20	Not null
CreateDateTime	Date time of record creation	Datetime		Not null
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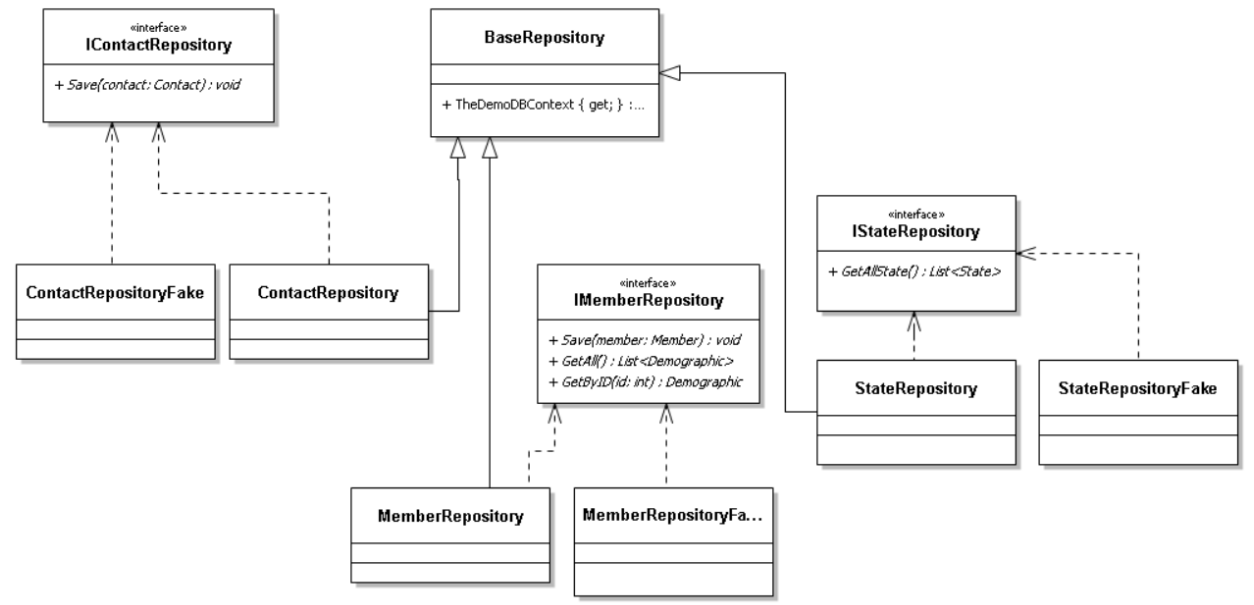
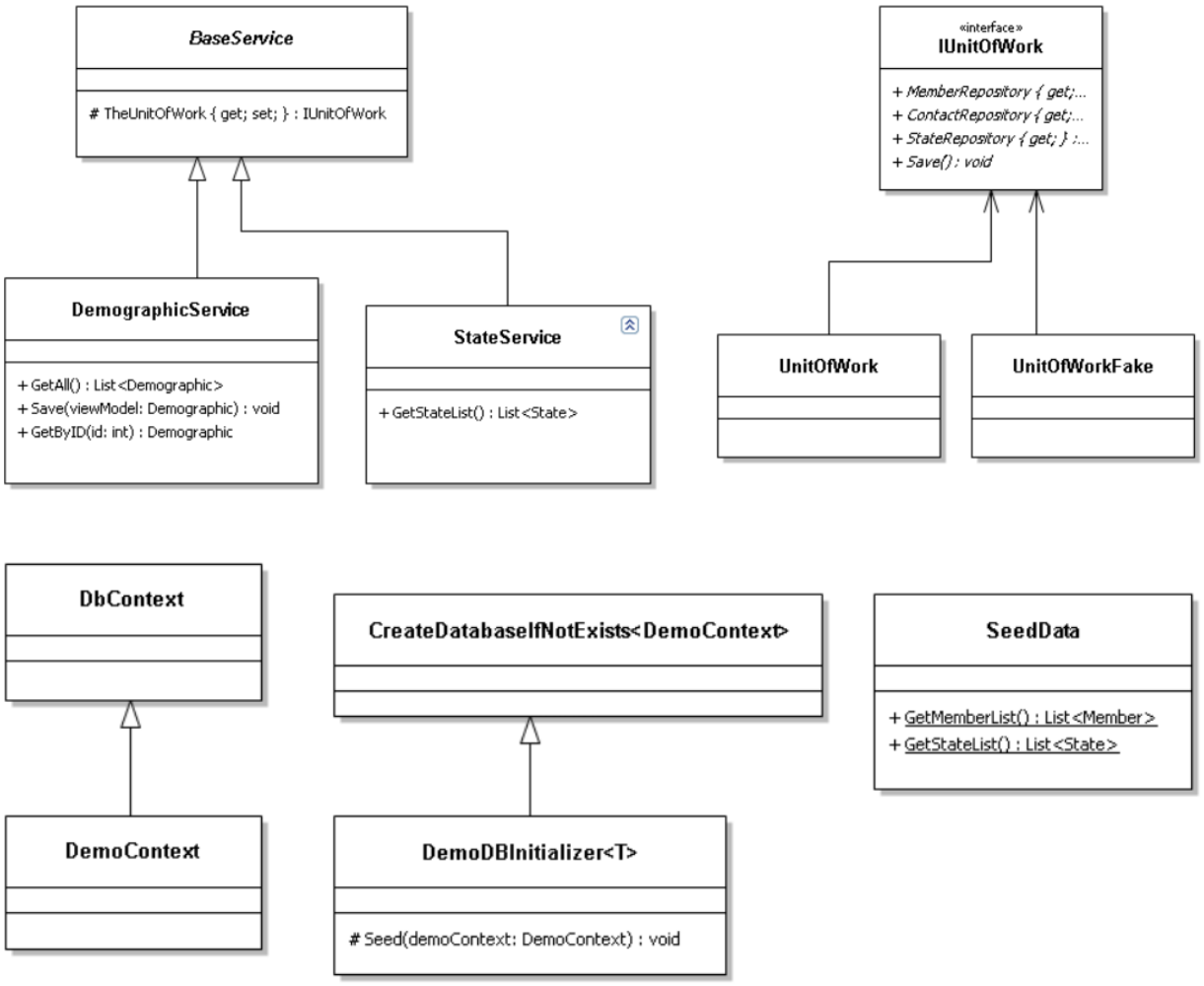
UpdateDateTime	Date time of record modification	Datetime		Not null

Class Diagram





Class Dependency & Dependency Injection

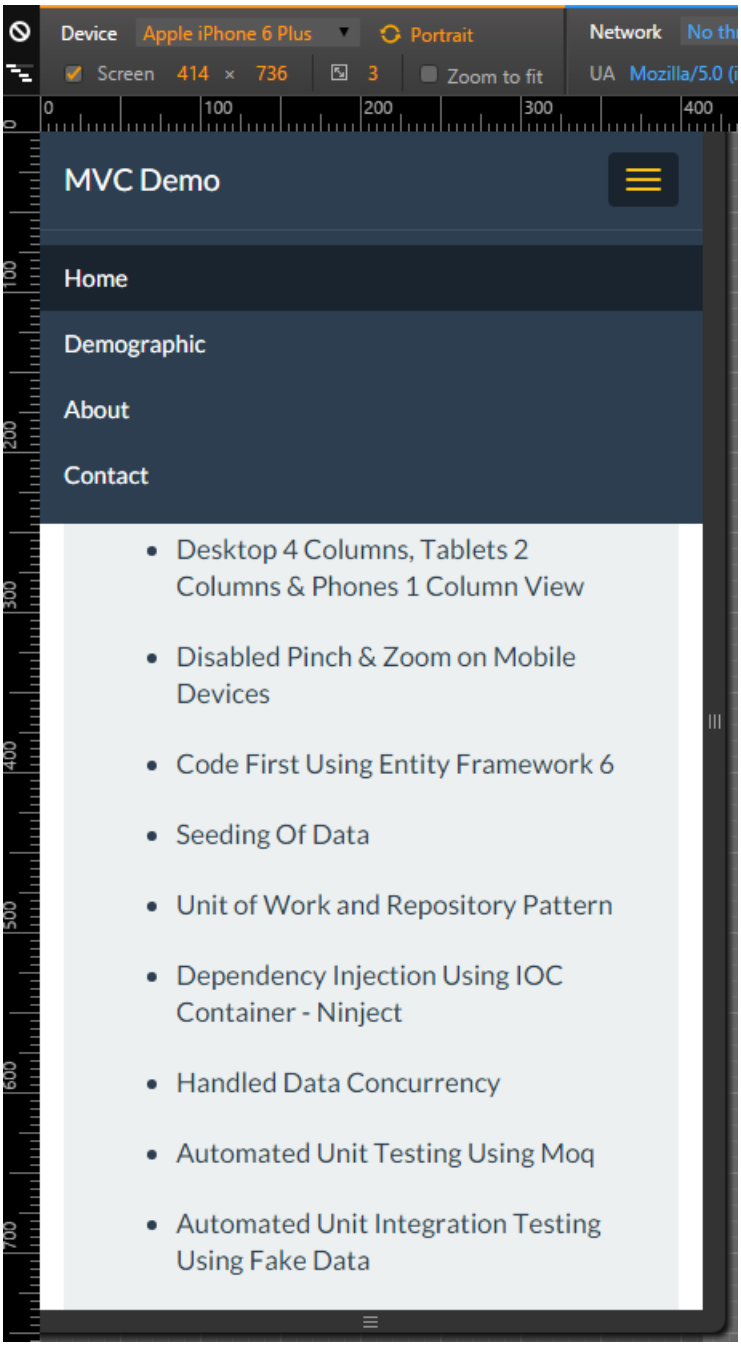
- Controllers are dependent on Service Classes
- Service Classes are dependent on Unit of Work
- Unit of Work is dependent on Repository classes
- Repositories are dependent on DBContext
- Ninject is used IOC container for Dependency Injection.

User Interface

Mobile screens are taken using developer tool of Chrome browser, so it may not looks similar to what you can experience on real device, however it should be close enough. I believe on real device it may look even better than this screens.

iPhone 6 Plus

Portrait

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MVC Demo
ASP.NET MVC 5 Demo Application
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Device
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414
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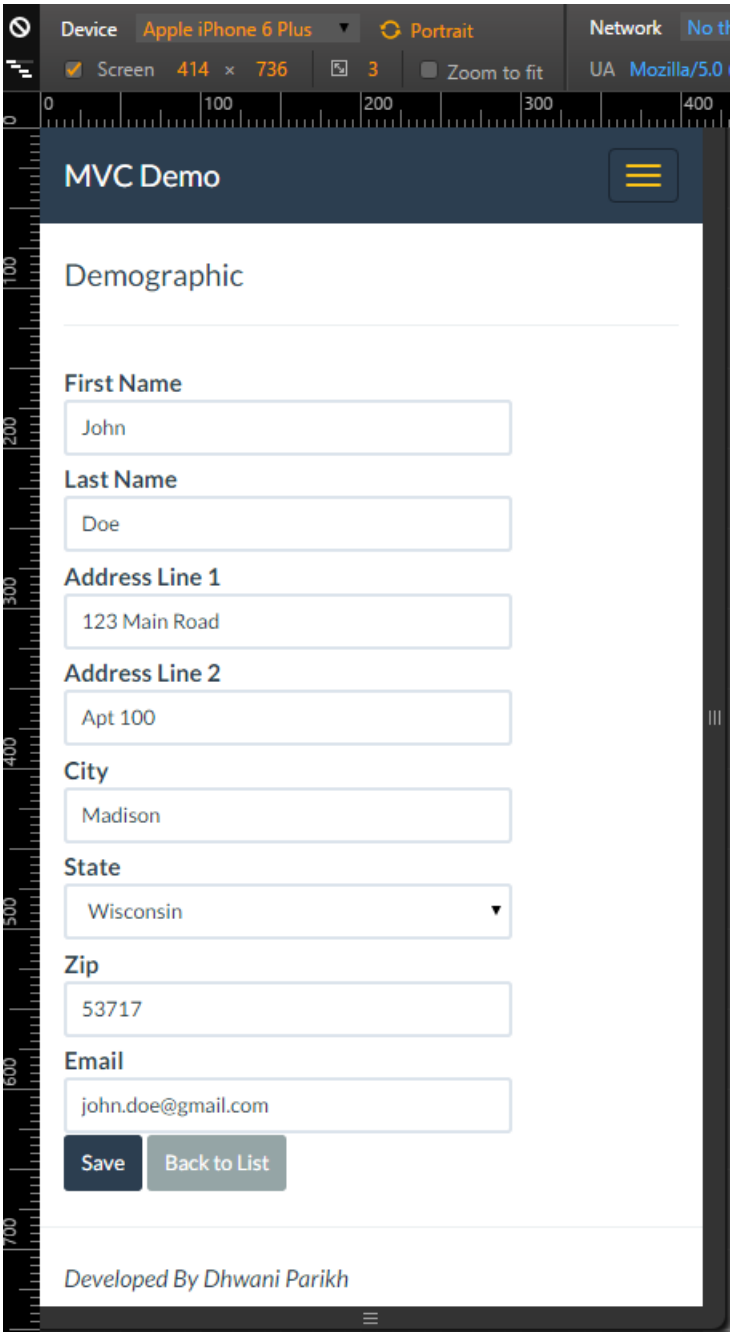
Zoom to fit
UA
MVC Demo
Members
Create New
Action
Name
Address
Email
Edit
Details
Doe, John
123 Main Road, Apt 100, Madison, Wisconsin 53717
Smith, James
1243 Mineral Point Road, Madison, Wisconsin 53713
Harris, Mary
555 State Street, Suite 203, Madison, Wisconsin 51117
Lee, Linda
1 Rosa Road, Apt 22, Madison, Wisconsin 54784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MVC Demo
Demographic
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John
Last Name
Doe
Address Line 1
123 Main Road
Address Line 2
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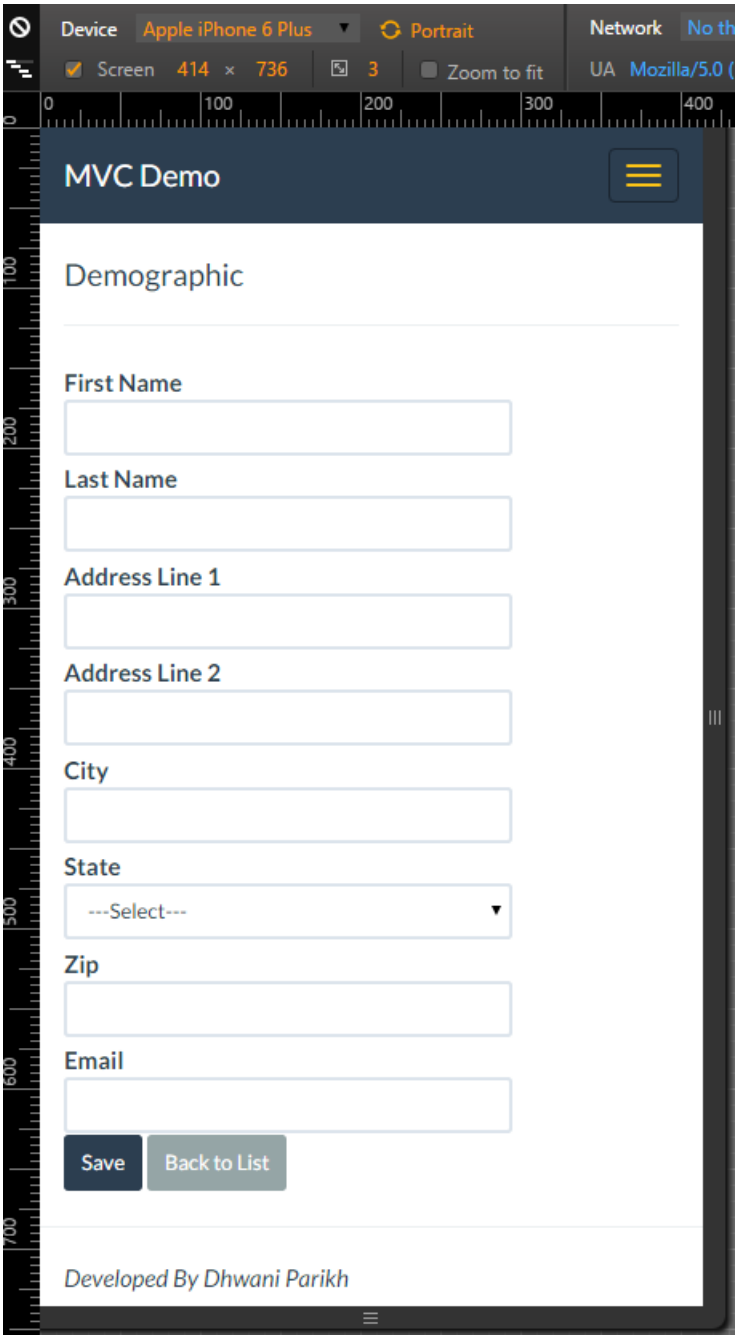
State
Wisconsin
Zip
53717
Email
john.doe@gmail.com
Save
Back to List
Developed By Dhwani Parikh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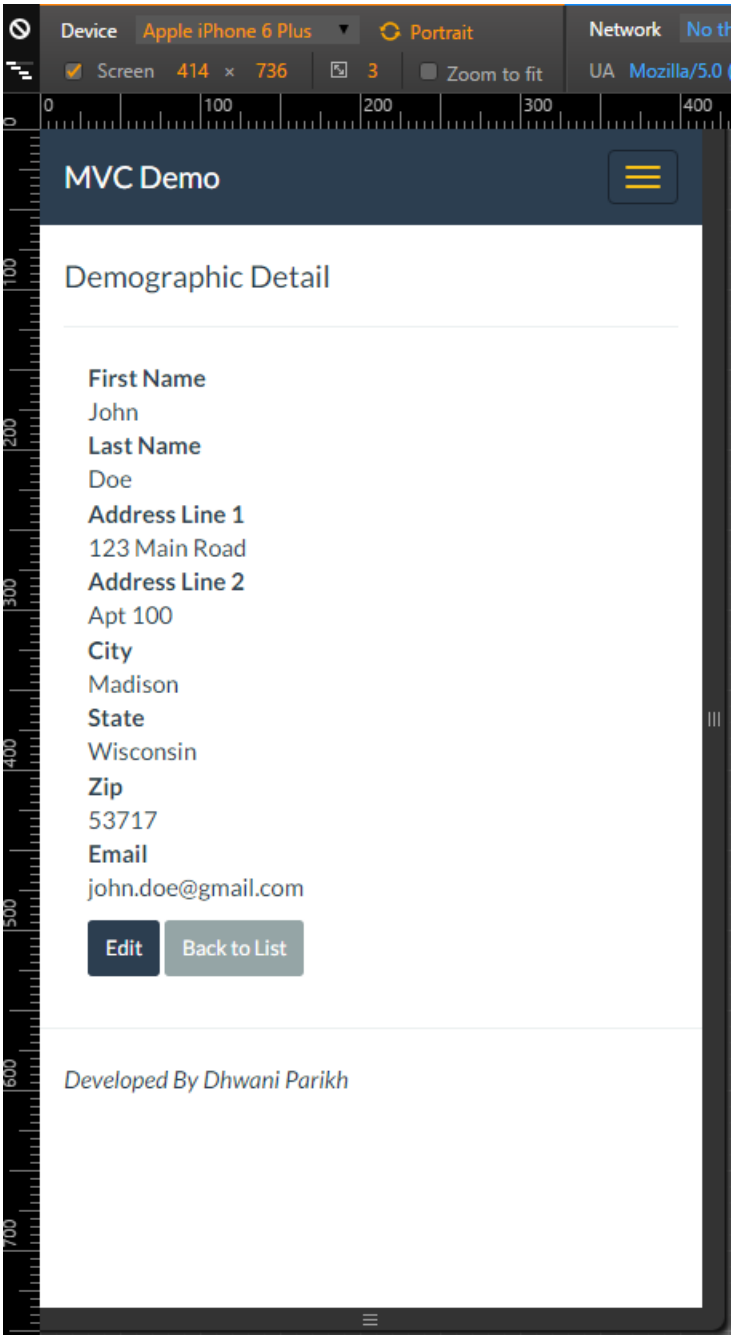
Back to List
Developed By Dhwani Parikh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UA Mozilla/5.0
MVC Demo
Demographic Detail
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John
Last Name
Doe
Address Line 1
123 Main Road
Address Line 2
Apt 100
City
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State
Wisconsin
Zip
53717
Email
john.doe@gmail.com
Edit
Back to List
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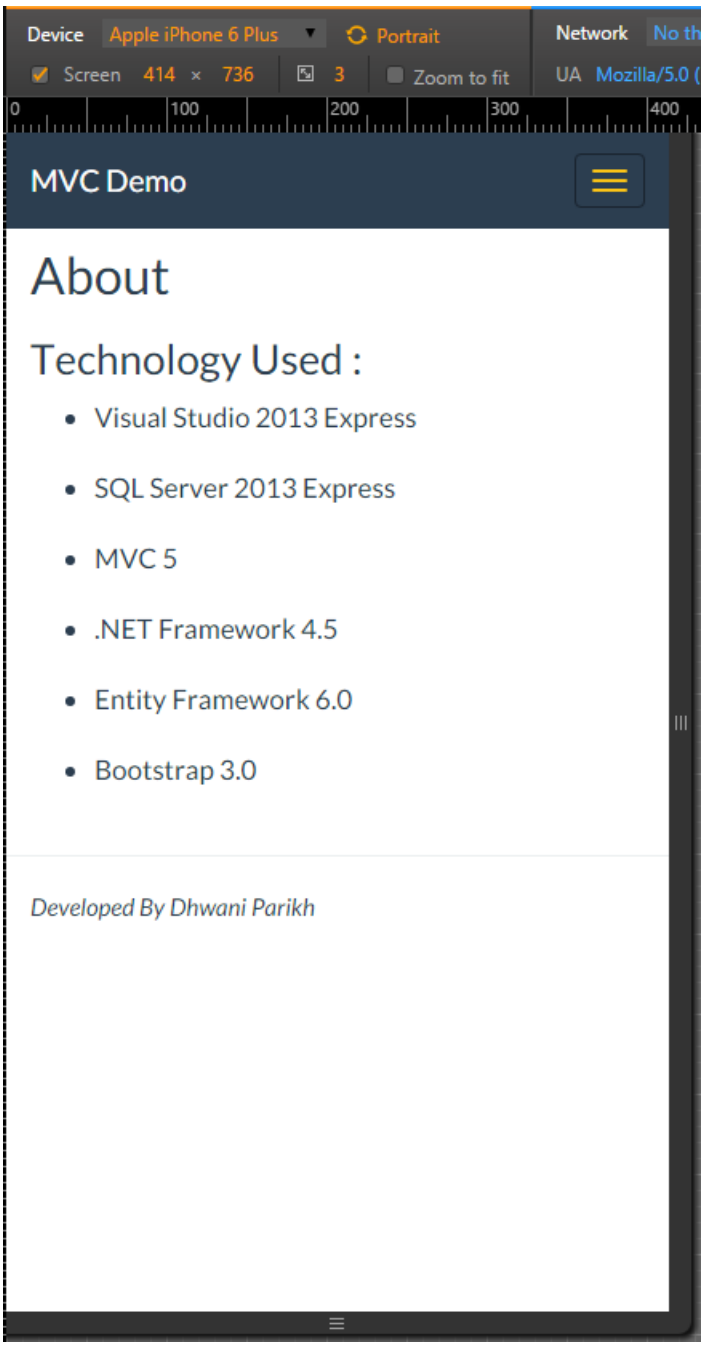
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MVC Demo
About
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Visual Studio 2013 Express
SQL Server 2013 Express
MVC 5
.NET Framework 4.5
Entity Framework 6.0
Bootstrap 3.0
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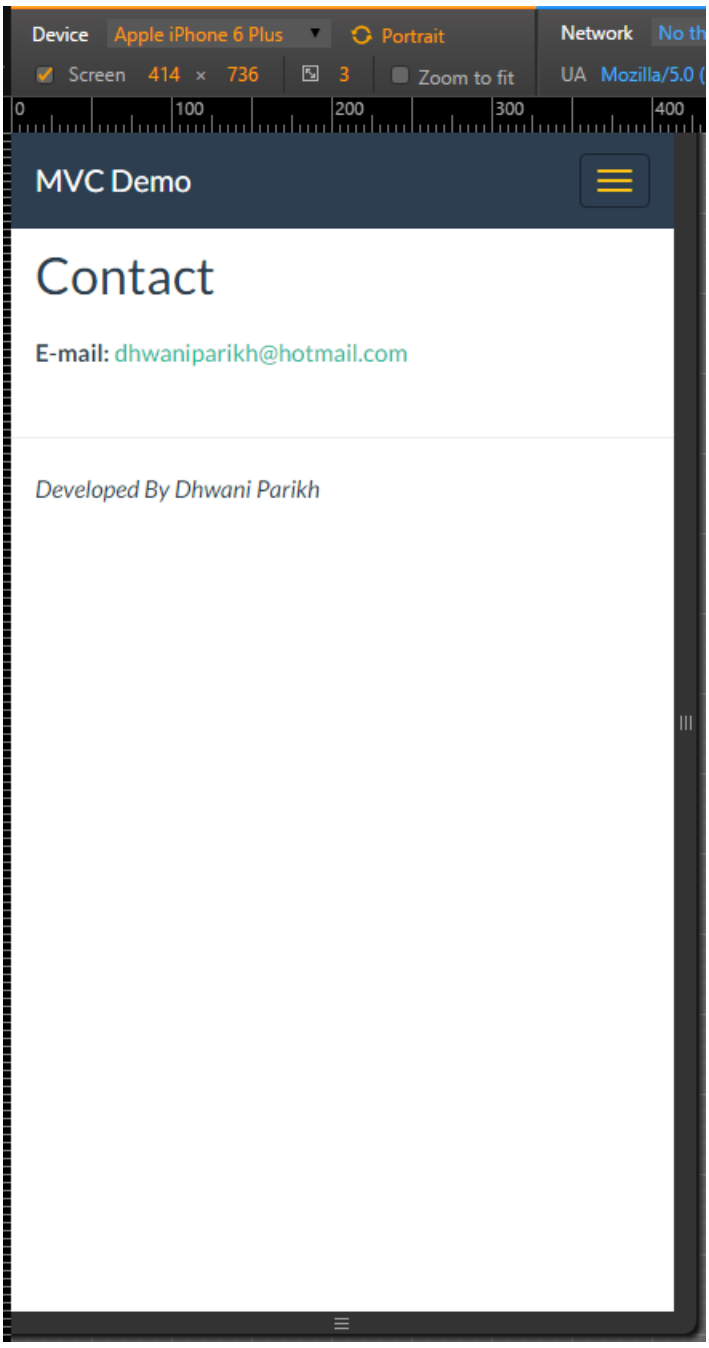
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MVC Demo
Contact
E-mail: dhwaniparikh@hotmail.com
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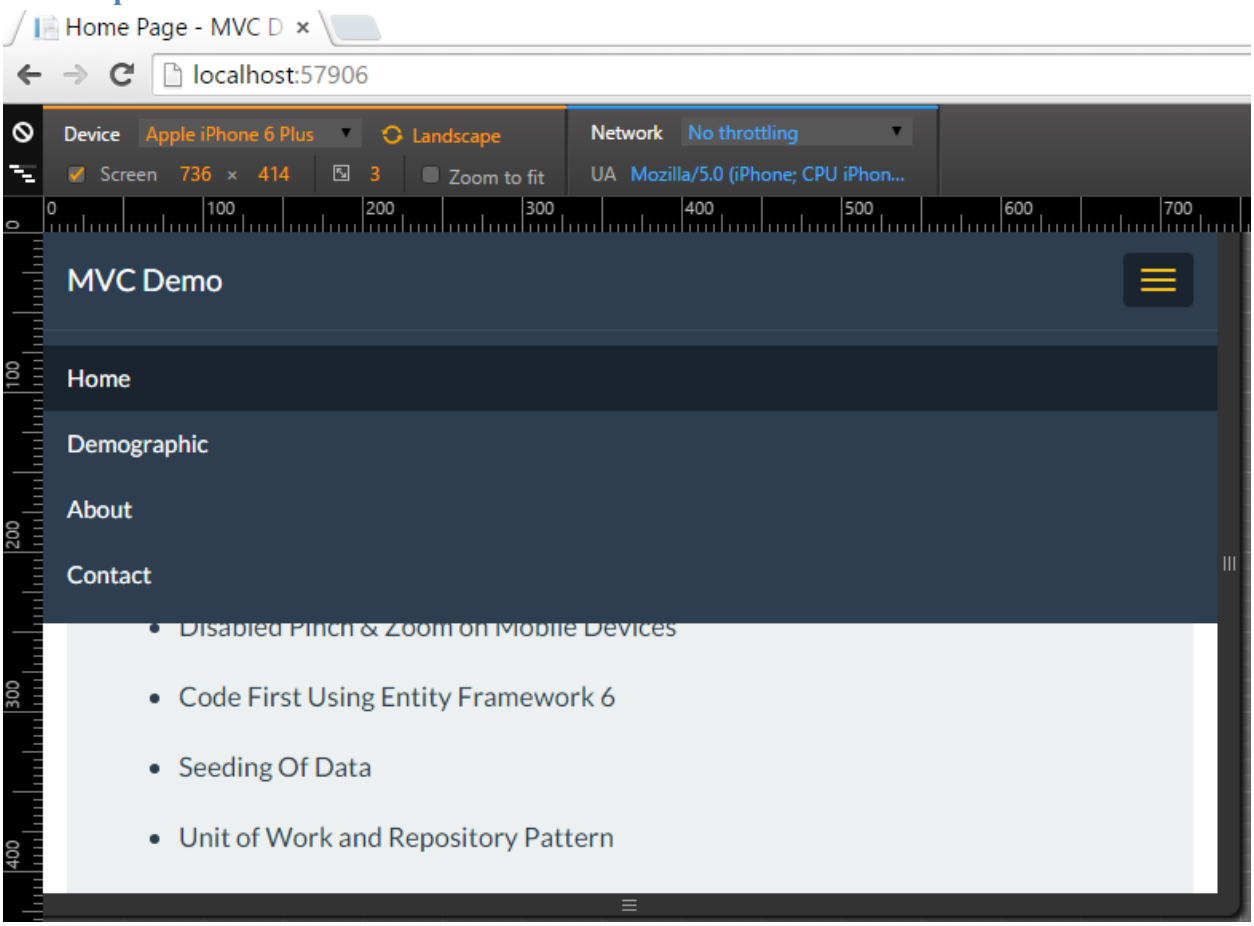
Landscape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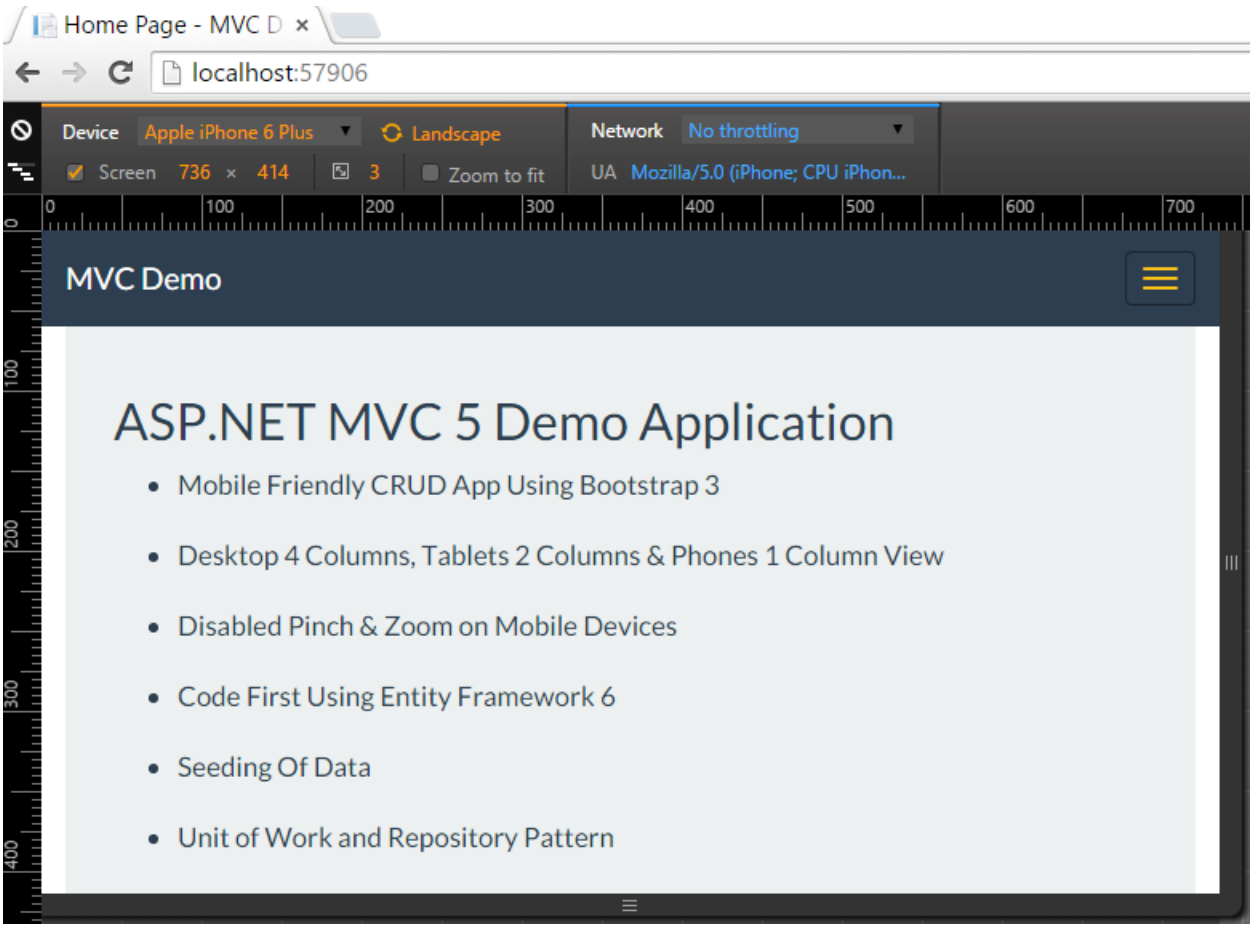
Demographic
About
Contact
Code First Using Entity Framework 6
Seeding Of Data
Unit of Work and Repository Pattern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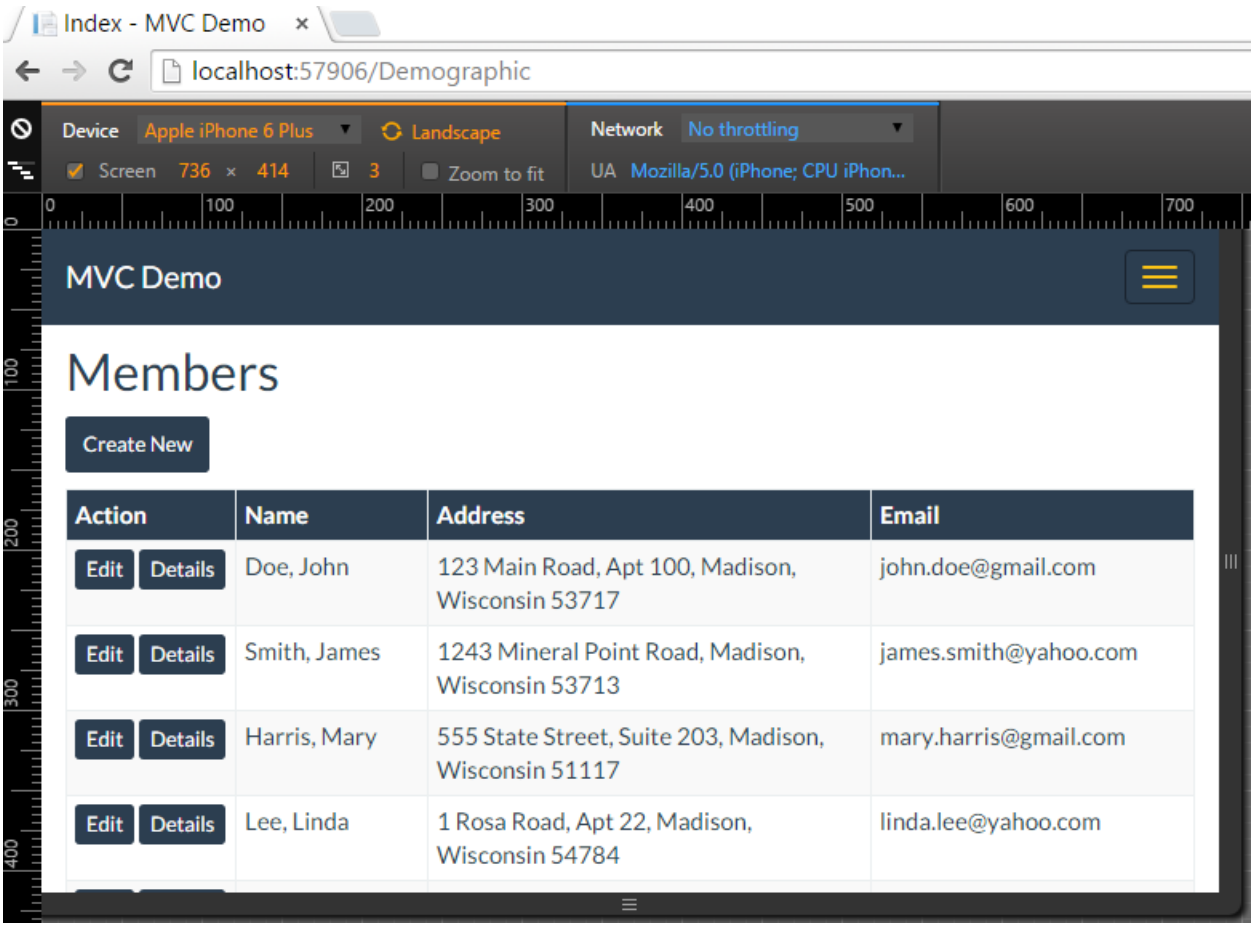
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MVC Demo
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Create New
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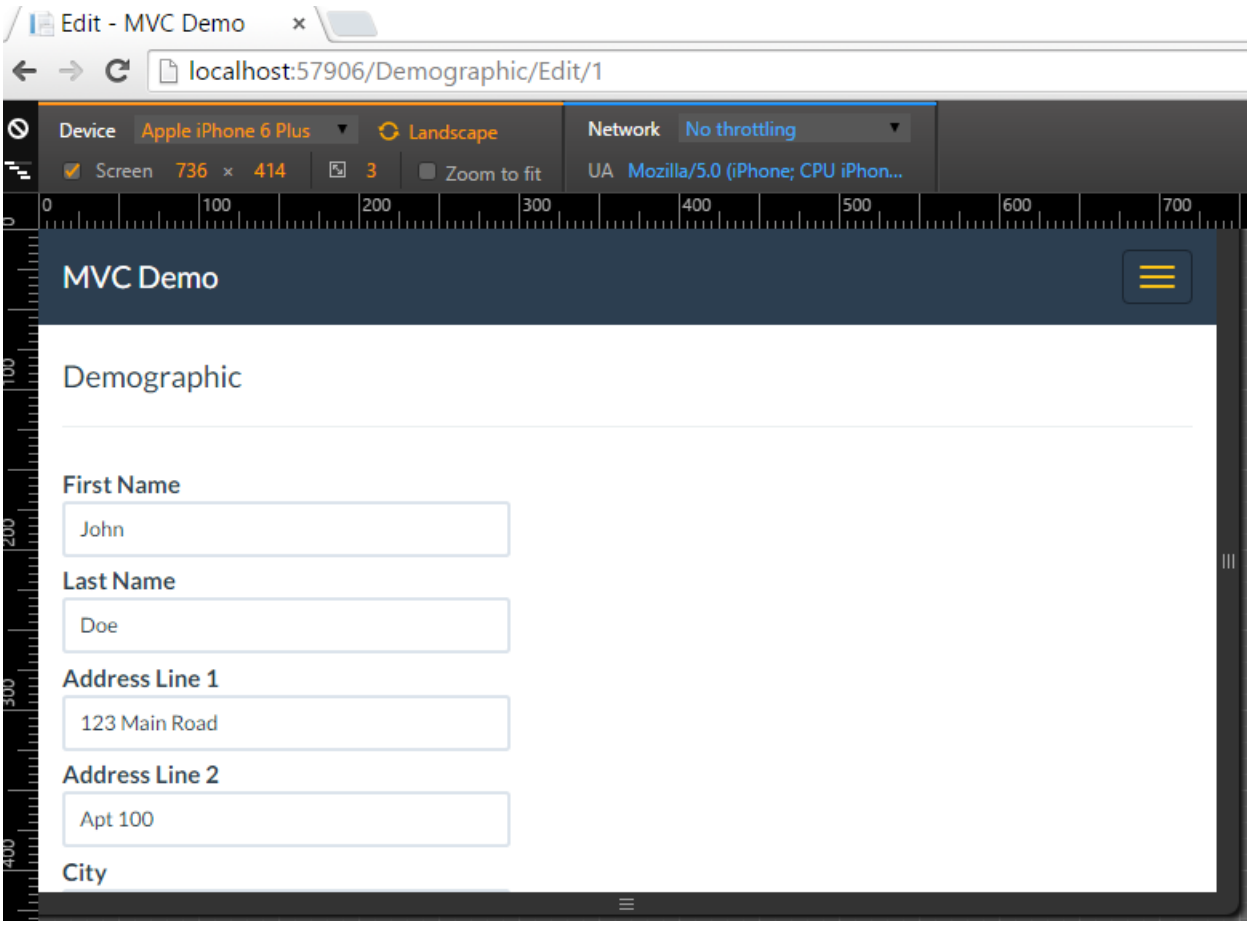
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Last Name
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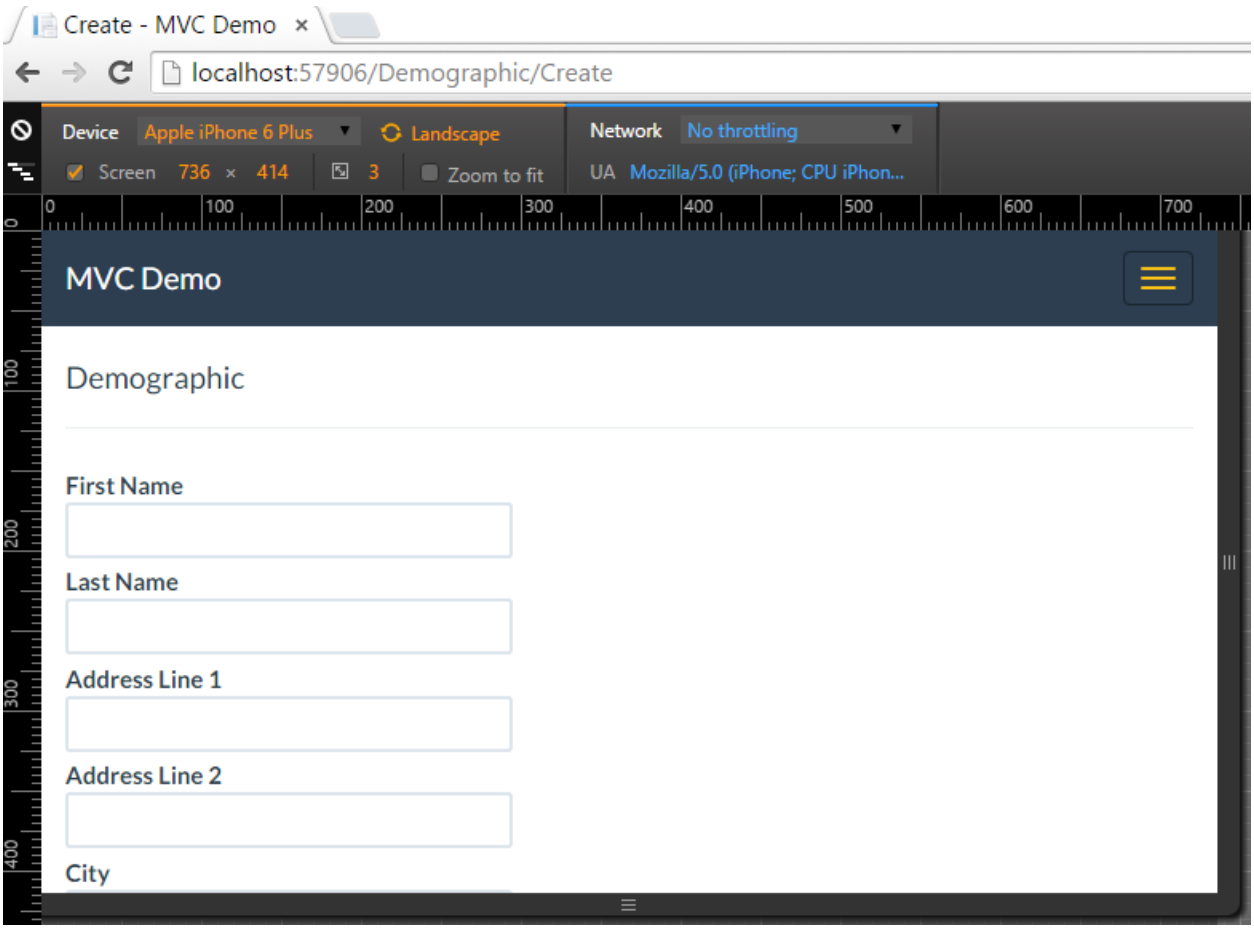
Address Line 2
Apt 100
City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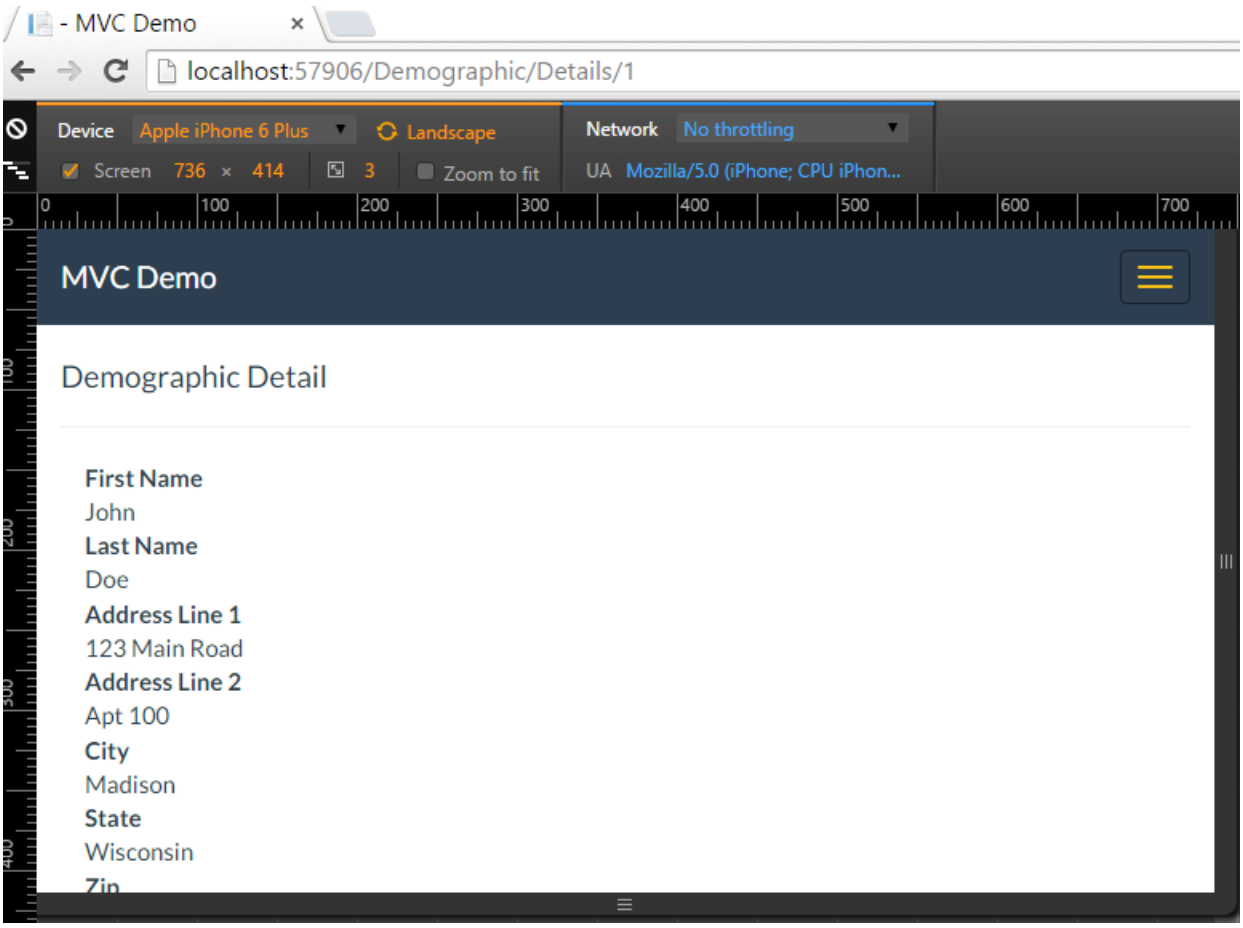
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MVC Demo
Demographic Detail
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John
Last Name
Doe
Address Line 1
123 Main Road
Address Line 2
Apt 100
City
Madison
State
Wisconsin
Zip

iPad

Portrait


MVC Demo
Home
Demographic
About
Contact
Members
Create New
Action
Name
Address
Email
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Miller, Michael
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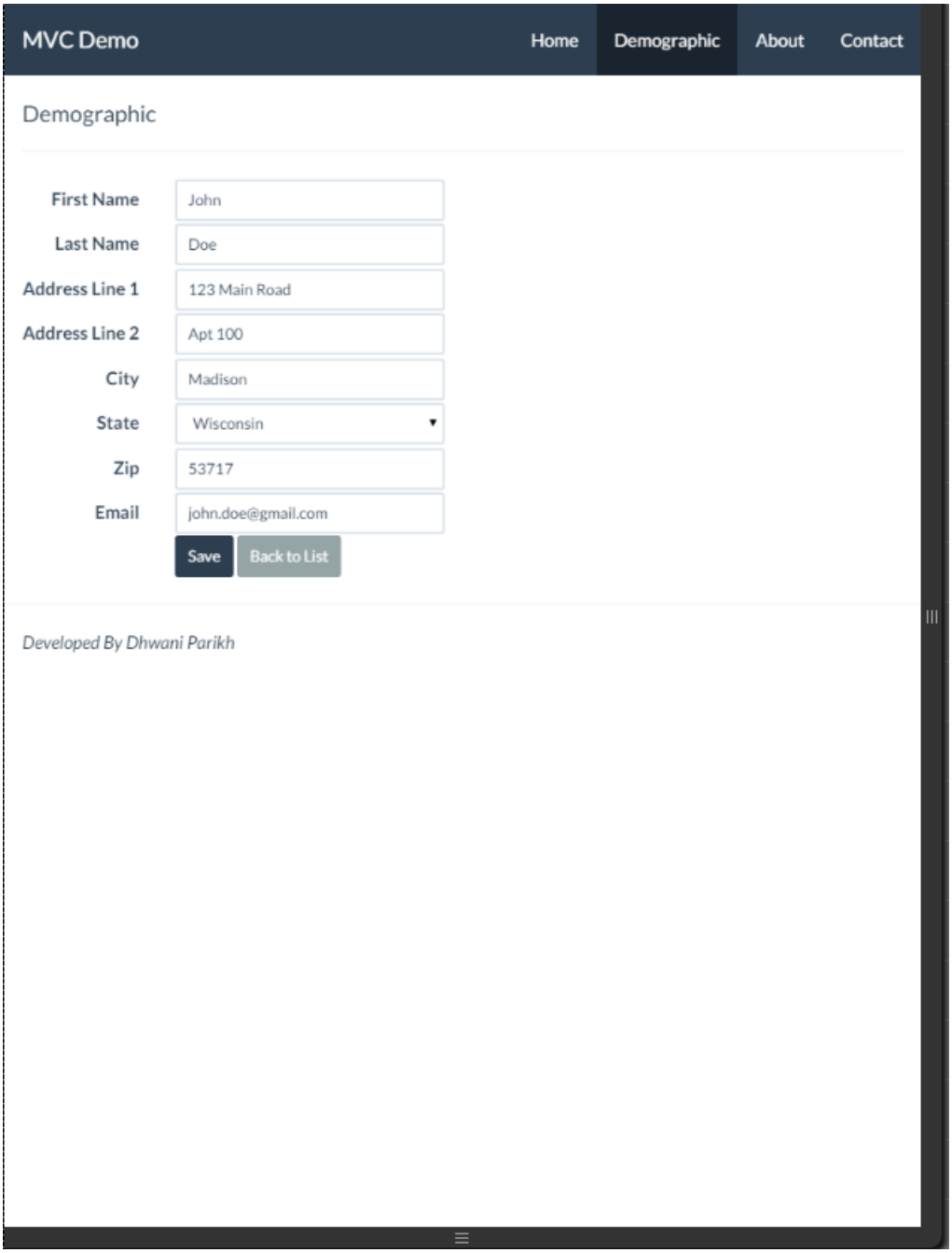
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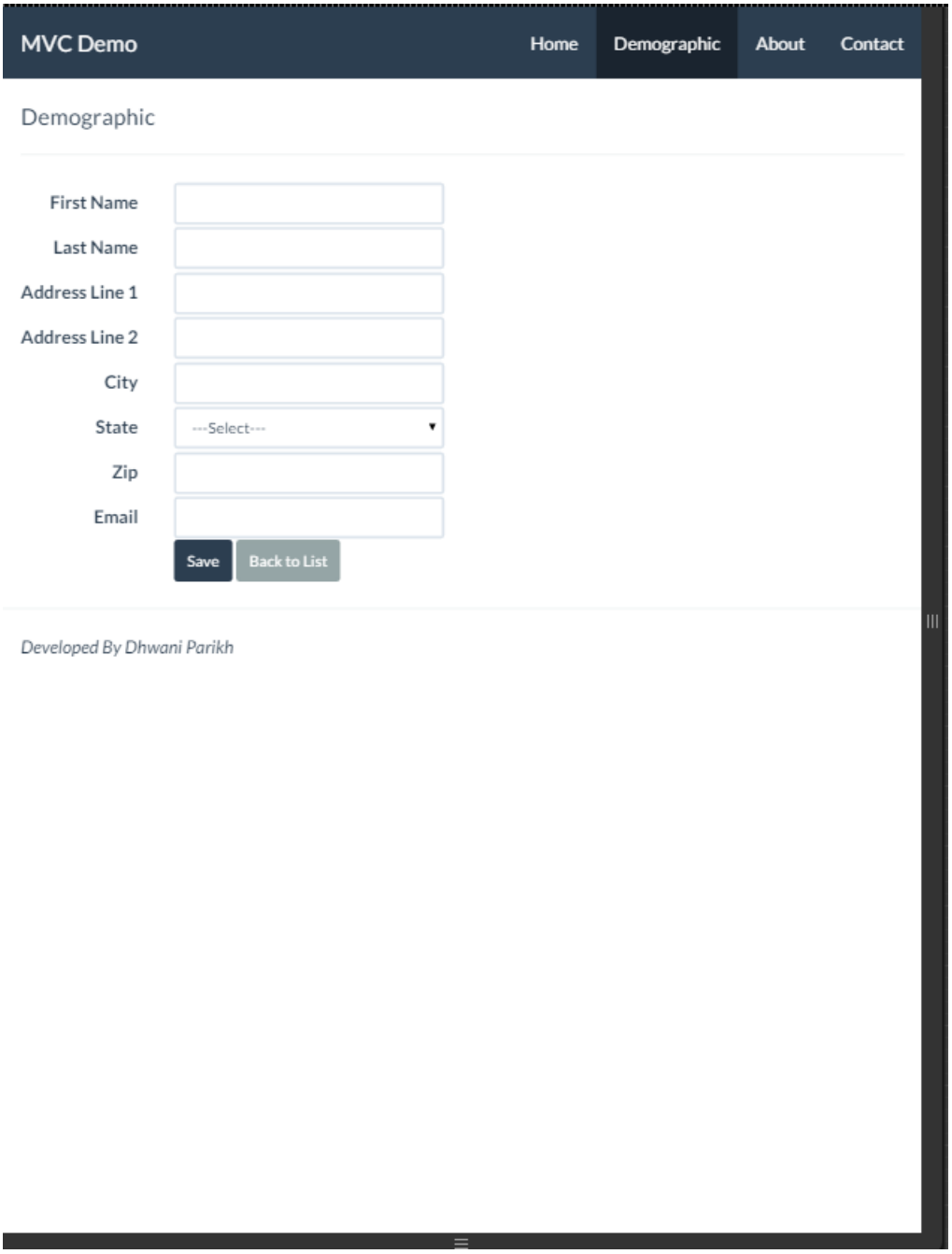
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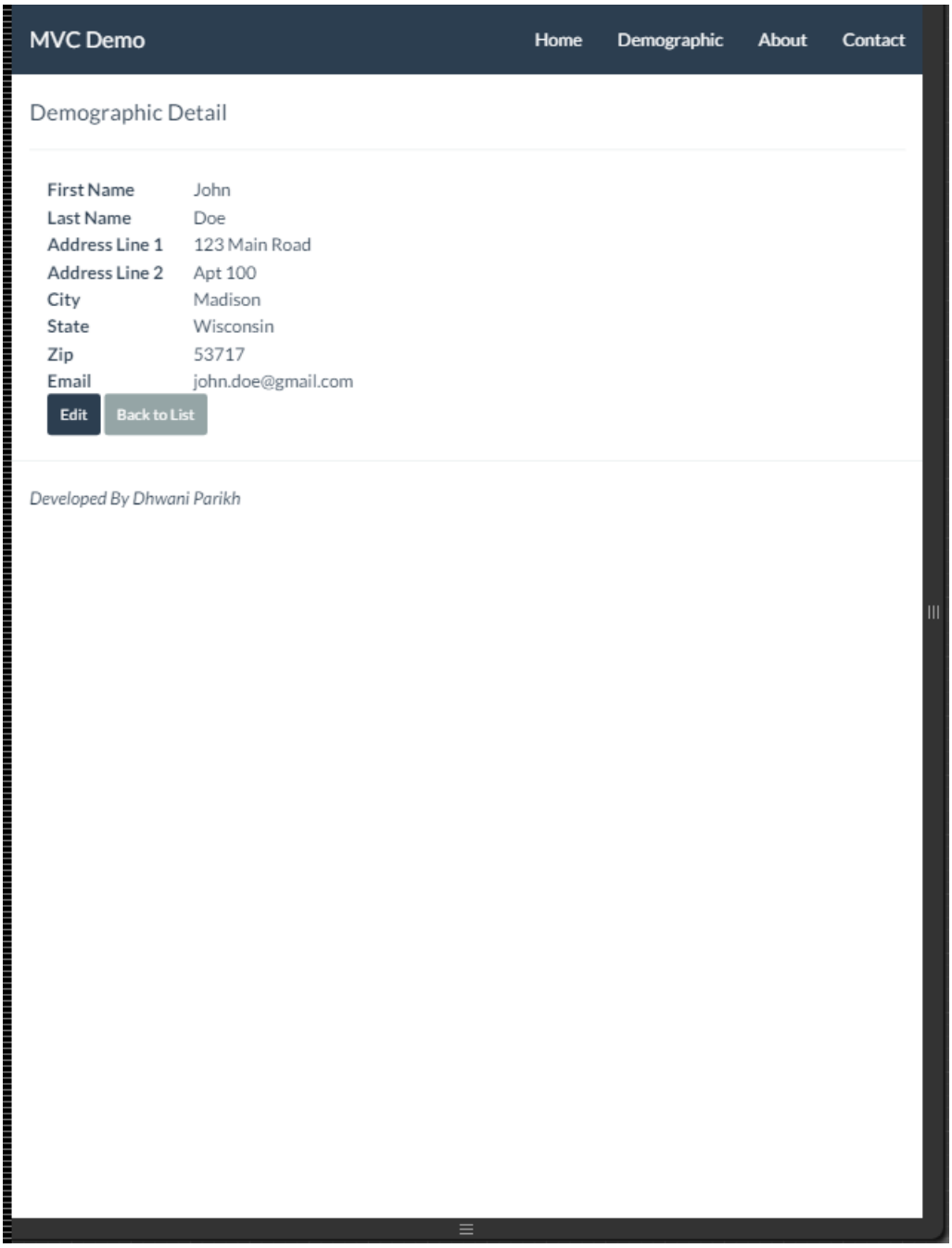
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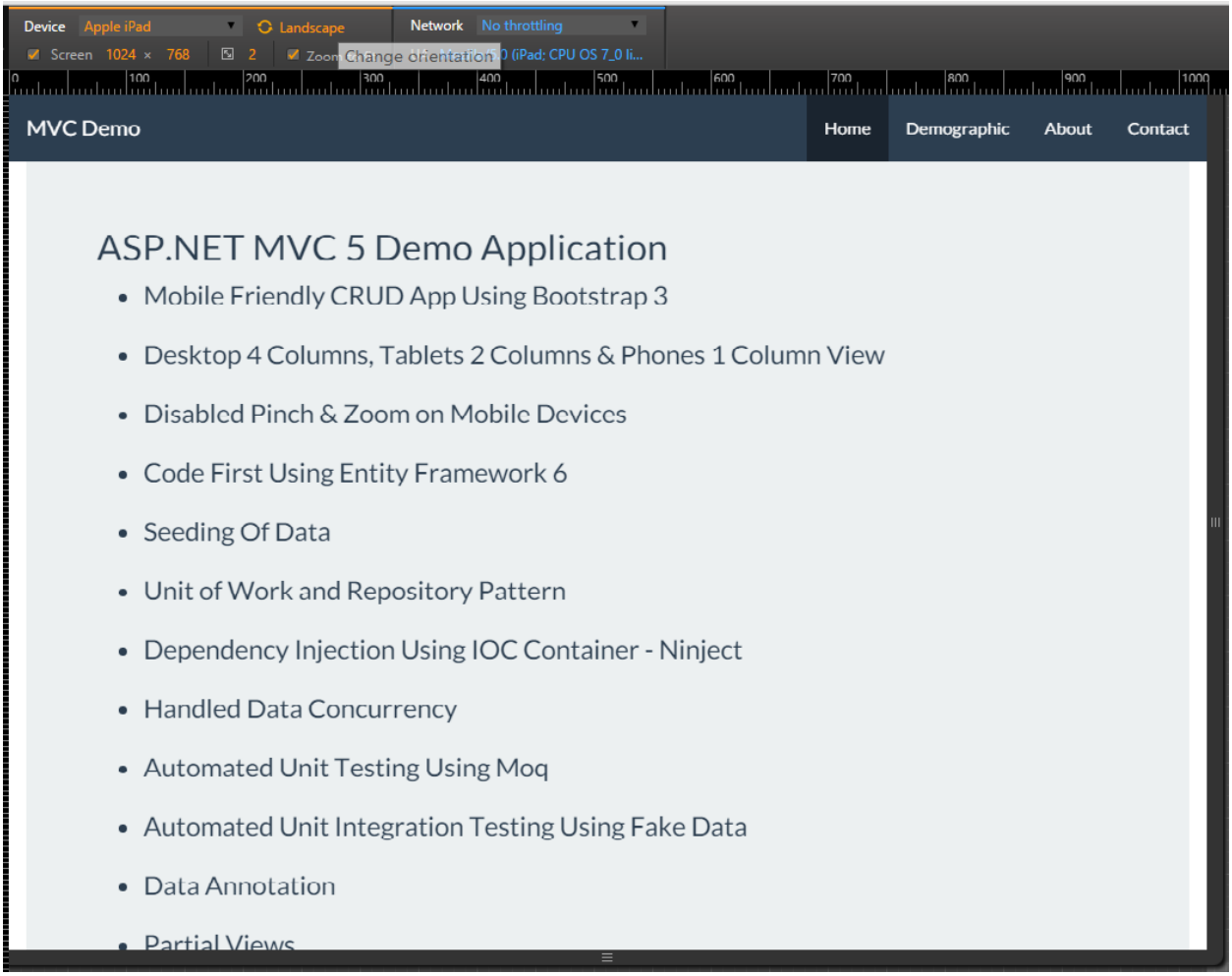
Back to List
Developed By Dhwani Parikh

Landscape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Change orientation
MVC Demo
Home
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About
Contact
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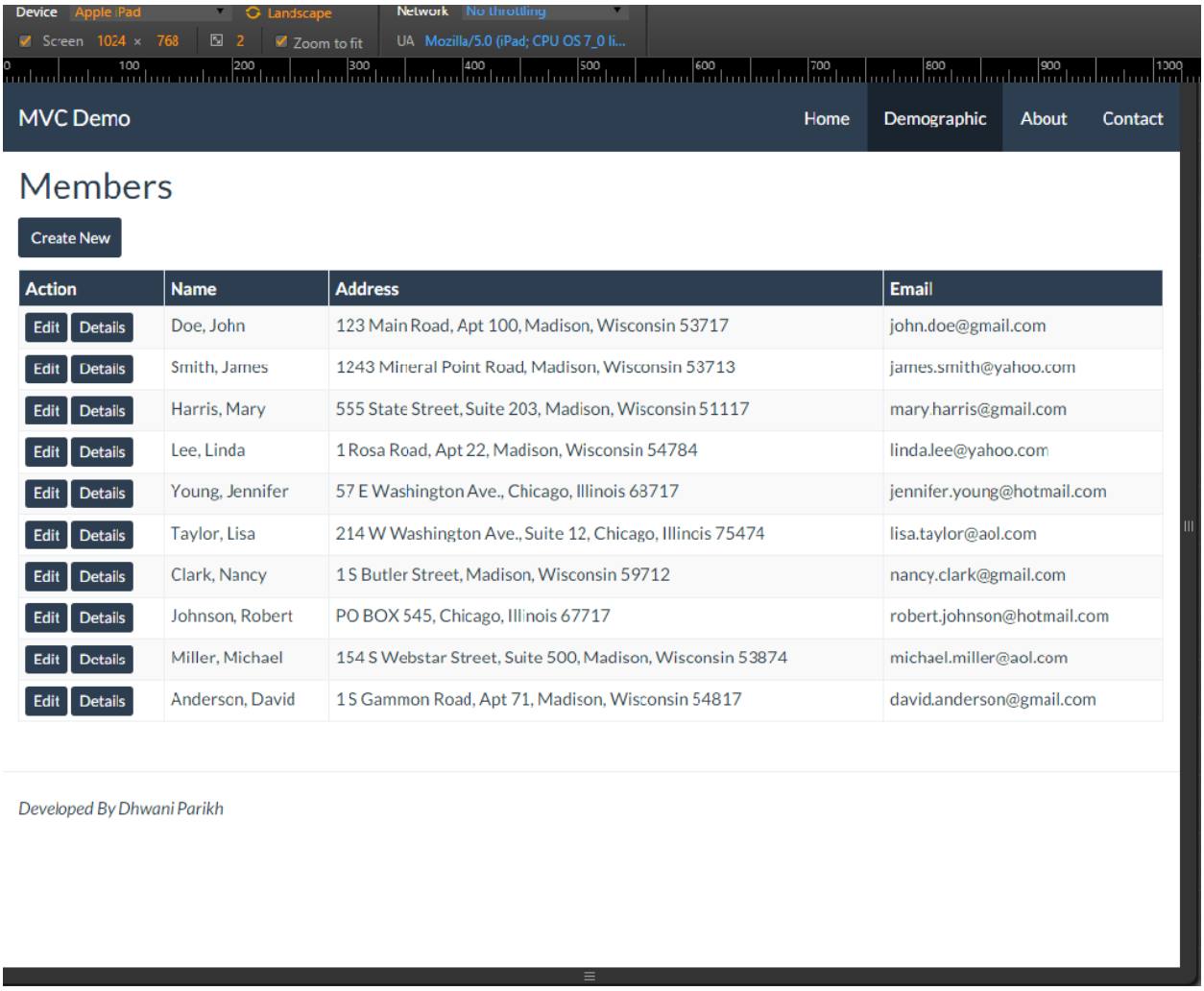
Partial Views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Miller, Michael
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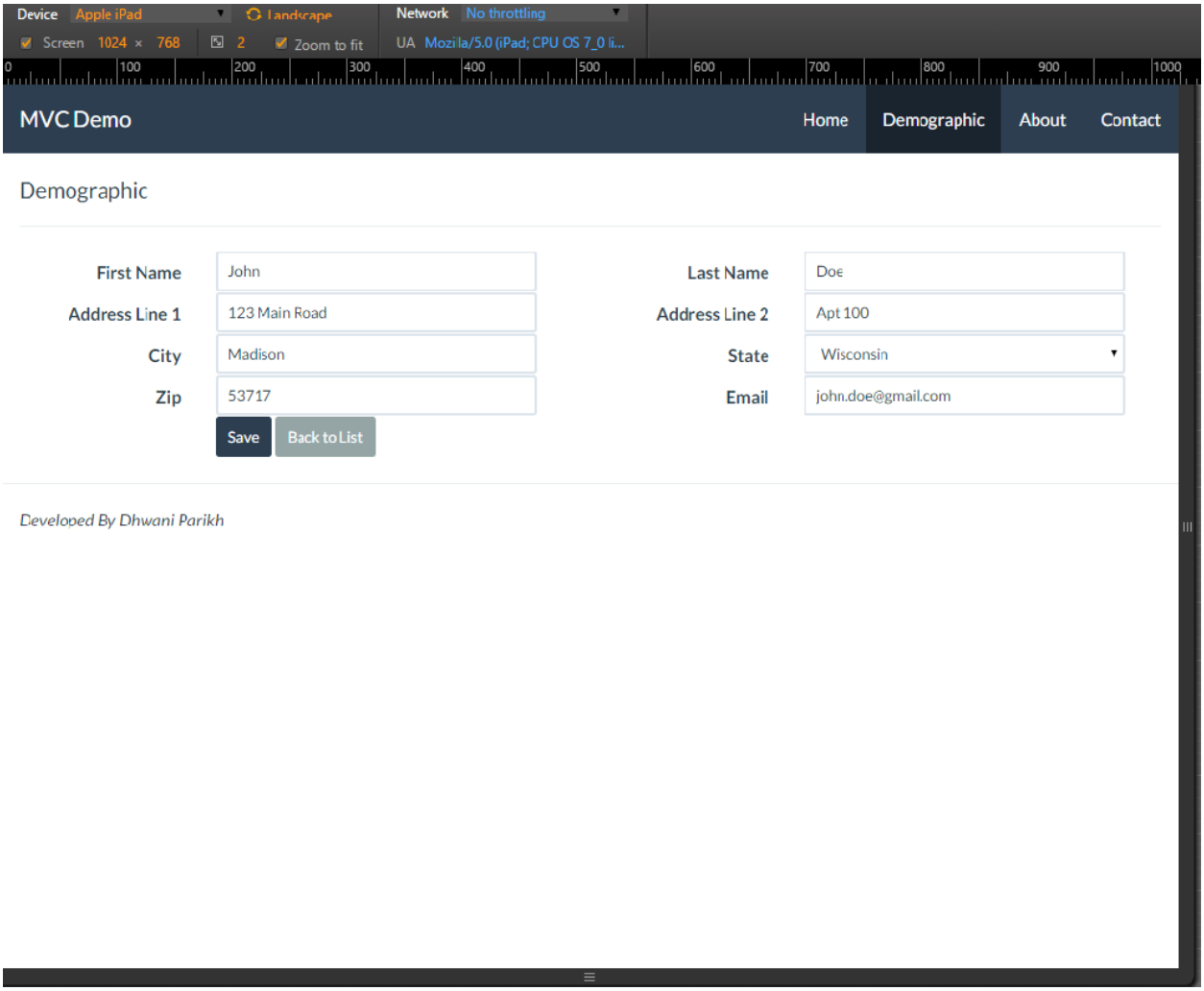
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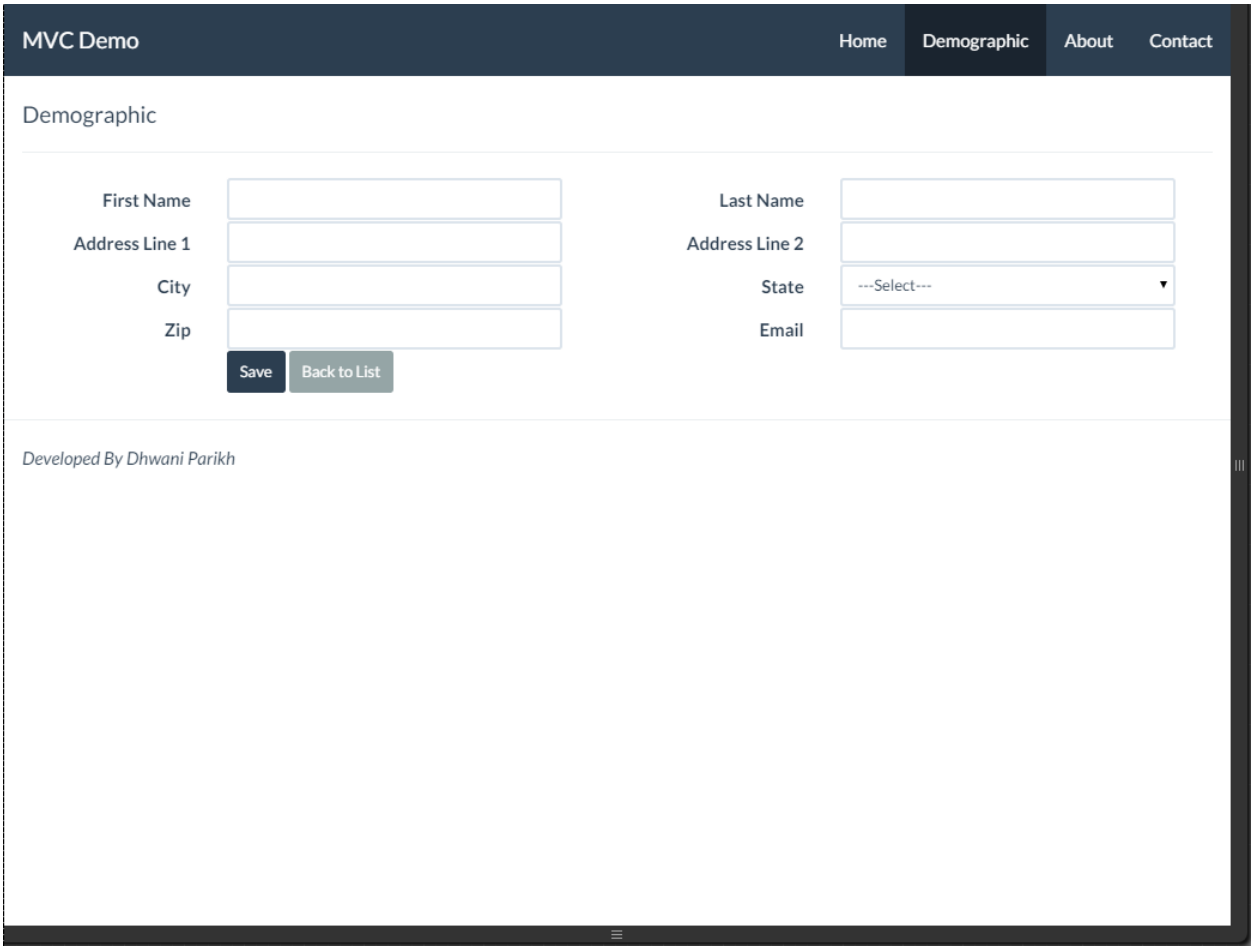
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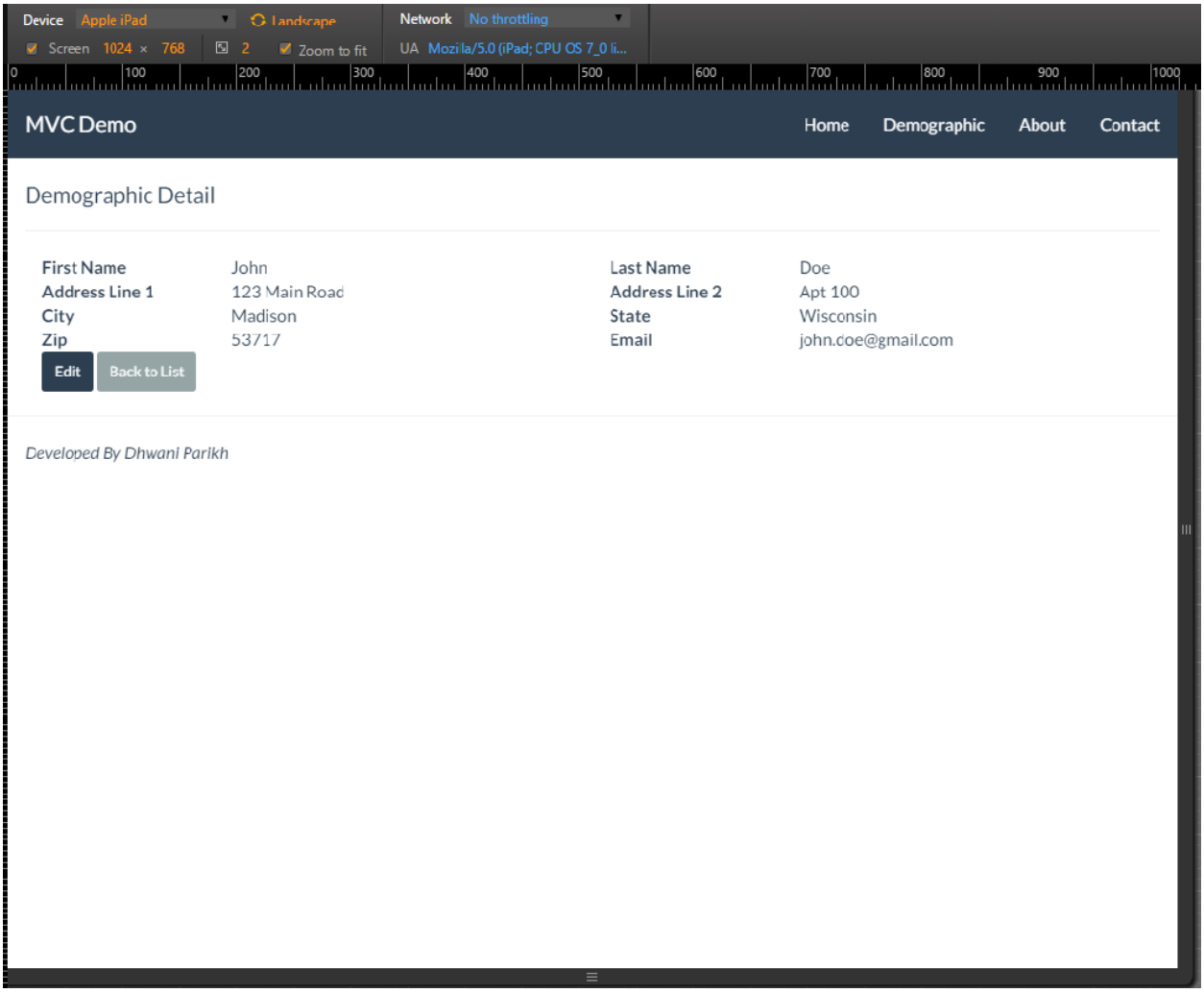
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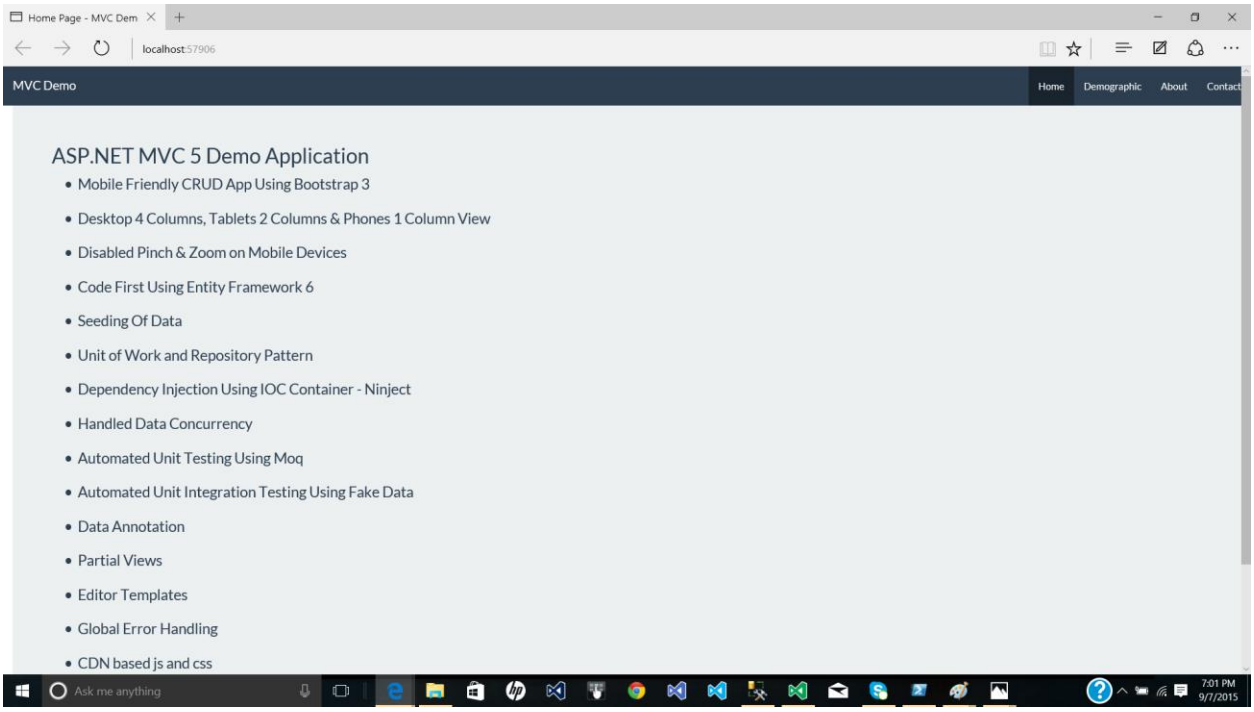
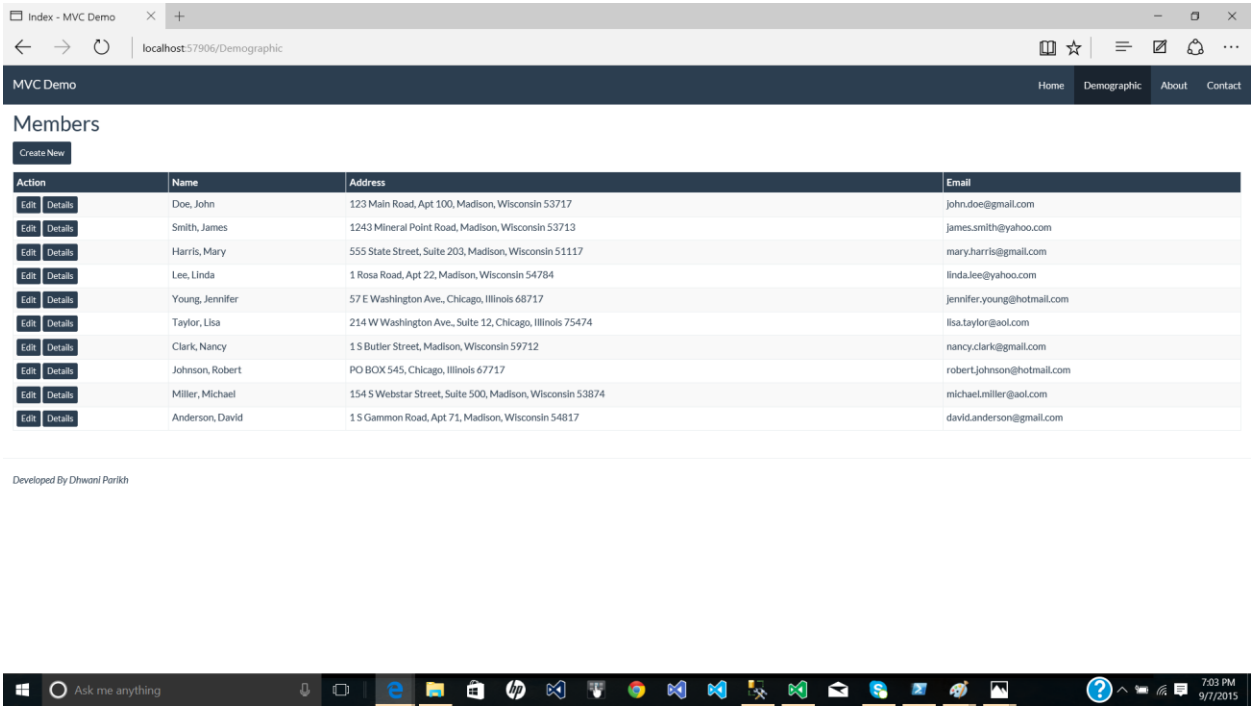
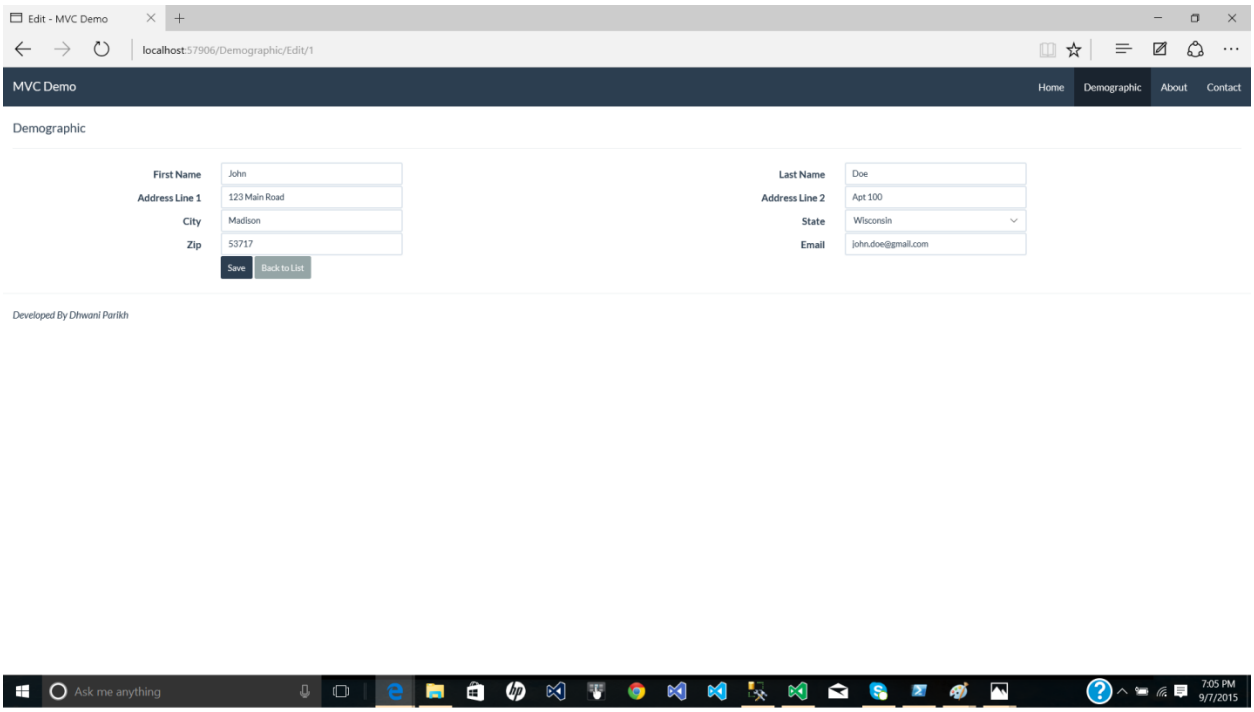
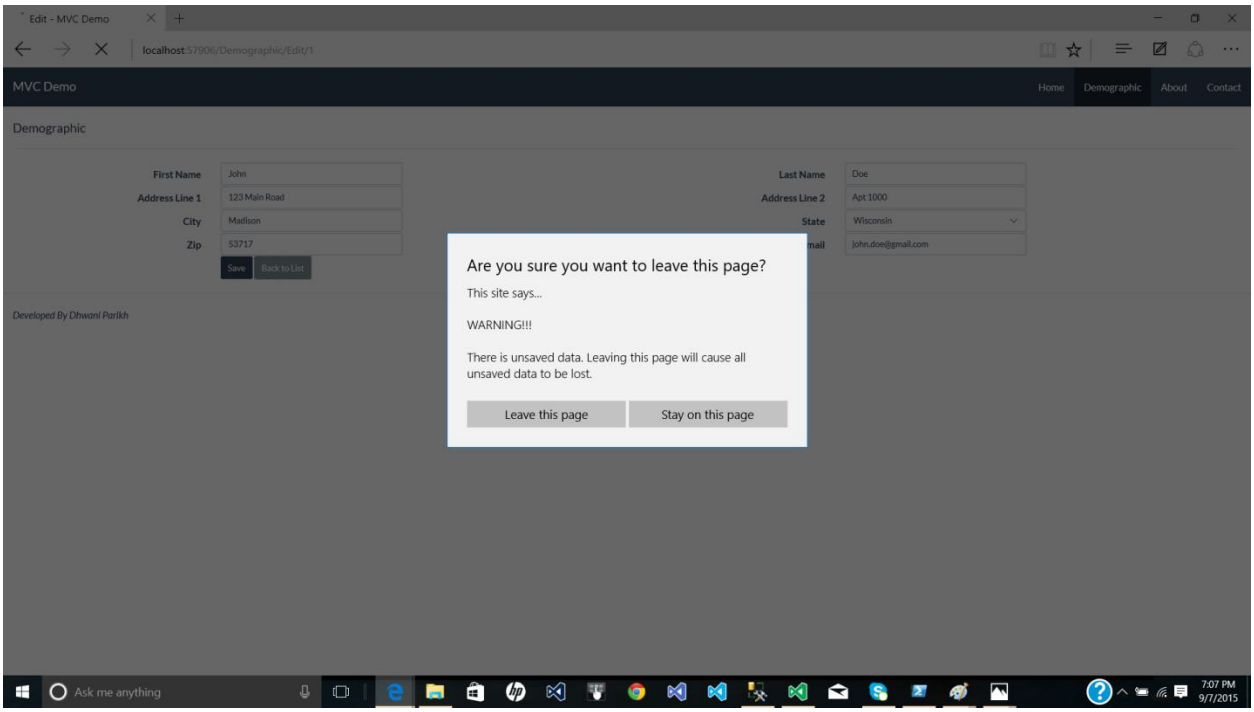
MVC Demo
Home Demographic About Contact
Demographic Detail
First Name John
Last Name Doe
Address Line 1 123 Main Road
Address Line 2 Apt 100
City Madison
State Wisconsin
Zip 53717
Email john.doe@gmail.com
Edit
Back to List
Developed By Dhwani Parikh

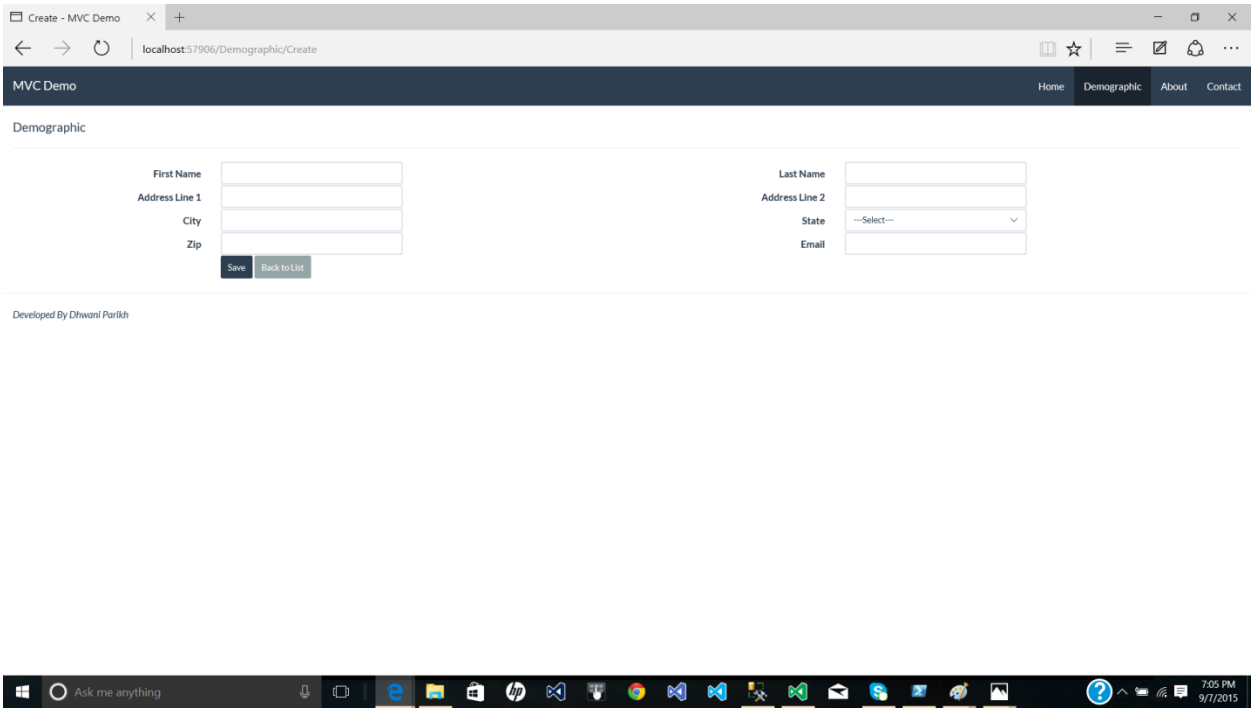
Desktop

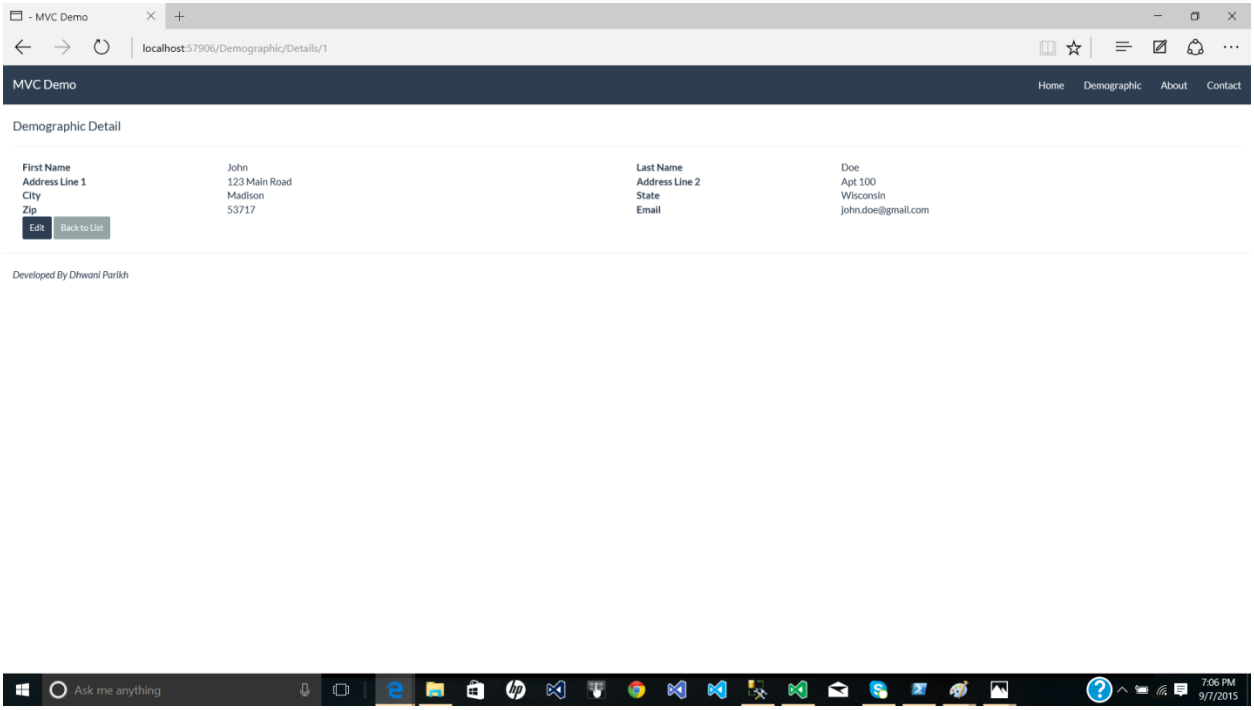

Home Page - MVC Dem
localhost:57906
MVC Demo
Home
Demographic
About
Contact
ASP.NET MVC 5 Demo Application
Mobile Friendly CRUD App Using Bootstrap 3
Desktop 4 Columns, Tablets 2 Columns & Phones 1 Column View
Disabled Pinch & Zoom on Mobile Devices
Code First Using Entity Framework 6
Seeding Of Data
Unit of Work and Repository Pattern
Dependency Injection Using IOC Container - Ninject
Handled Data Concurrency
Automated Unit Testing Using Moq
Automated Unit Integration Testing Using Fake Data
Data Annotation
Partial Views
Editor Templates
Global Error Handling
CDN based js and css
Ask me anything
7:01 PM
9/7/2015


Index - MVC Demo
localhost:57906/Demographic
MVC Demo
Home
Demographic
About
Contact
Members
Create New
Action
Name
Address
Email
Edit Details
Doe, John
123 Main Road, Apt 100, Madison, Wisconsin 53717
john.doe@gmail.com
Smith, James
1243 Mineral Point Road, Madison, Wisconsin 53713
james.smith@yahoo.com
Harris, Mary
555 State Street, Suite 203, Madison, Wisconsin 51117
mary.harris@gmail.com
Lee, Linda
1 Rosa Road, Apt 22, Madison, Wisconsin 54784
linda.lee@yahoo.com
Young, Jennifer
57 E Washington Ave., Chicago, Illinois 68717
jennifer.young@hotmail.com
Taylor, Lisa
214 W Washington Ave., Suite 12, Chicago, Illinois 75474
lisa.taylor@aol.com
Clark, Nancy
1 S Butler Street, Madison, Wisconsin 59712
nancy.clark@gmail.com
Johnson, Robert
PO BOX 545, Chicago, Illinois 67717
robert.johnson@hotmail.com
Miller, Michael
154 S Webstar Street, Suite 500, Madison, Wisconsin 53874
michael.miller@aol.com
Anderson, David
1 S Gammon Road, Apt 71, Madison, Wisconsin 54817
david.anderson@gmail.com
Developed By Dhwani Parikh
Ask me anything
7:03 PM
9/7/2015


Edit - MVC Demo
localhost:57906/Demographic/Edit/1
MVC Demo
Home
Demographic
About
Contact
Demographic
First Name
John
Address Line 1
123 Main Road
City
Madison
Zip
53717
Save
Back to List
Last Name
Doe
Address Line 2
Apt 100
State
Wisconsin
Email
john.doe@gmail.com
Developed By Dhwani Parikh
Ask me anything
7:05 PM
9/7/2015


Edit - MVC Demo
localhost:57906/Demographic/Edit/1
MVC Demo
Home
Demographic
About
Contact
Demographic
First Name
John
Address Line 1
123 Main Road
City
Madison
Zip
53717
Save
Back to List
Last Name
Doe
Address Line 2
Apt 1000
State
Wisconsin
Developed By Dhwani Parikh
Are you sure you want to leave this page?
This site says...
WARNING!!!
There is unsaved data. Leaving this page will cause all unsaved data to be lost.
Leave this page
Stay on this page
Ask me anything
7:07 PM
9/7/2015


Create - MVC Demo
localhost:57906/Demographic/Create
MVC Demo
Home
Demographic
About
Contact
Demographic
First Name
Address Line 1
City
Zip
Last Name
Address Line 2
State
---Select---
Email
Save
Back to List
Developed By Dhwani Parikh
Ask me anything
7:05 PM
9/7/2015


- MVC Demo
localhost:57906/Demographic/Details/1
MVC Demo
Home
Demographic
About
Contact
Demographic Detail
First Name
Address Line 1
City
Zip
John
123 Main Road
Madison
53717
Last Name
Address Line 2
State
Email
Doe
Apt 100
Wisconsin
john.doe@gmail.com
Edit
Back to List
Developed By Dhwani Parikh
Ask me anything
7:06 PM
9/7/2015

System Validation

- First name is required
- Last name is required
- Address line 1 is required
- City is required
- State is required
- Zip code is required
- Zip code should be either in ##### or #####-#### format
- Email is required
- Email should be in aa@aa.aa format

Testing

Setup

Before you run test cases, **change the connectionString** under `<connectionStrings>` section in the app.config file.

These test cases will support only SQL Server database.

Run Test Case:

To run Test cases, click on **TEST > Run > All Tests** menu.

Test case are designed using code first approach, so when you run test case very first time, system will generate the database(if it does not exist) and also enter data for 10 members automatically for you.

What if you do not have SQL Server? :

Incase if you do not have SQL Server or due to some reason application is unable to create / connect to database server then you can bypass database and can still run test cases.

There is a key called "**UseDatabase**" in the app.config under <`appSettings`> section. Default value for this key is set as **True**. You can set that key value to **false** and test case will run against in memory data. When it runs against in memory data, test case will NOT SAVE any of your change.

All test cases are developing using stand AAA (Arrange, Act and Assert) syntax approach.

Unit testing using Moq

I have used Moq as mocking component to do unit level testing with MS Test. Test method s are developed for all action methods of demographicController class and couple of method of Demographic Service class.

For DemographicController class, System under test is various action methods which are dependent on service class, and hence mocking was done on service class method.

For Demographic Service class, system under test is various public virtual method of DemographicService class which is dependent on Repository class, and hence mocking was done on repository class methods.

Automated unit integration testing without UI

Following two test cases are developed to test end to end functionality without user interface, such test case are useful to test your functionality when UI is still under development, or once you go live and after that, if you make any change then such test cases can be executed as part of regression test.

1. test_demographic_creation
2. test_demographic_updation

Above two test cases not only test insert and update, but it will also test GetAll and GetByID internally.

Error Handling and Logging

Application level error handing is implemented and for all unhandled error, standard user friendly error message will be displayed. Due to access problem, error logging in text or xml file etc is not implemented however necessary implementation is already coded to handle the error and pass the error, controller and action method name to ErrorLoggerService class. You can implement LogError method as you wish to log error.

Instead of custom error message, if you want to see the actual error message (classic yellow screen) then you set `<customErrors mode="Off">` in web.config file