SWISRANKS TEST Assignment

~Documentation~

This is sample web application I have developed based on Requirements of swisranks co.ltd

I have used ASP.NET core with visual studio c# 2019 with following packages,

```xml
<PackageReference Include="Microsoft.AspNetCore.Authentication.Google" Version="5.0.9" />
  <PackageReference Include="Microsoft.AspNetCore.Authentication.OpenIdConnect" Version="5.0.9" />
  <PackageReference Include="Microsoft.AspNetCore.Identity.EntityFrameworkCore" Version="5.0.9" />
  <PackageReference Include="Microsoft.AspNetCore.Mvc.Razor.RuntimeCompilation" Version="5.0.9" />
  <PackageReference Include="Microsoft.EntityFrameworkCore.Sqlite" Version="5.0.8" />
  <PackageReference Include="Microsoft.EntityFrameworkCore.SqlServer" Version="5.0.8" />
  <PackageReference Include="Microsoft.EntityFrameworkCore.Tools" Version="5.0.8">
```

First I have implemented this application by giving hard to get better understanding,

I have used cookie Authentication scheme, to create this,

Here is first method I have created using name identifier scheme,

```
//[HttpPost("login")]
      //public async Task<IActionResult> validate(string username, string password, string returnUrl)
      //{
      //    ViewData["ReturnUrl"] = returnUrl;
      //    if (username == "AAA" && password == "123")
      //    {

      //            var claims = new List<Claim>();
      //            claims.Add(new Claim("username", username));
      //            claims.Add(new Claim(ClaimTypes.NameIdentifier, username));
//simply we can add any name here...
```

```
//          claims.Add(new Claim(ClaimTypes.Name, username));
            //var ClaimsIdentity = new ClaimsIdentity(claims,
    CookieAuthenticationDefaults.AuthenticationScheme);
//          var ClaimsPrincipal = new ClaimsPrincipal(ClaimsIdentity);
//          await HttpContext.SignInAsync(ClaimsPrincipal);
//          return Redirect(returnUrl);


//          // return View("Secured");
//      }

//      TempData["Error"] = "Error. username and/or Password is incorrect";
//      return View("login");// BadRequest();

//}
```

Here I have written small function to check user is authenticated or not,
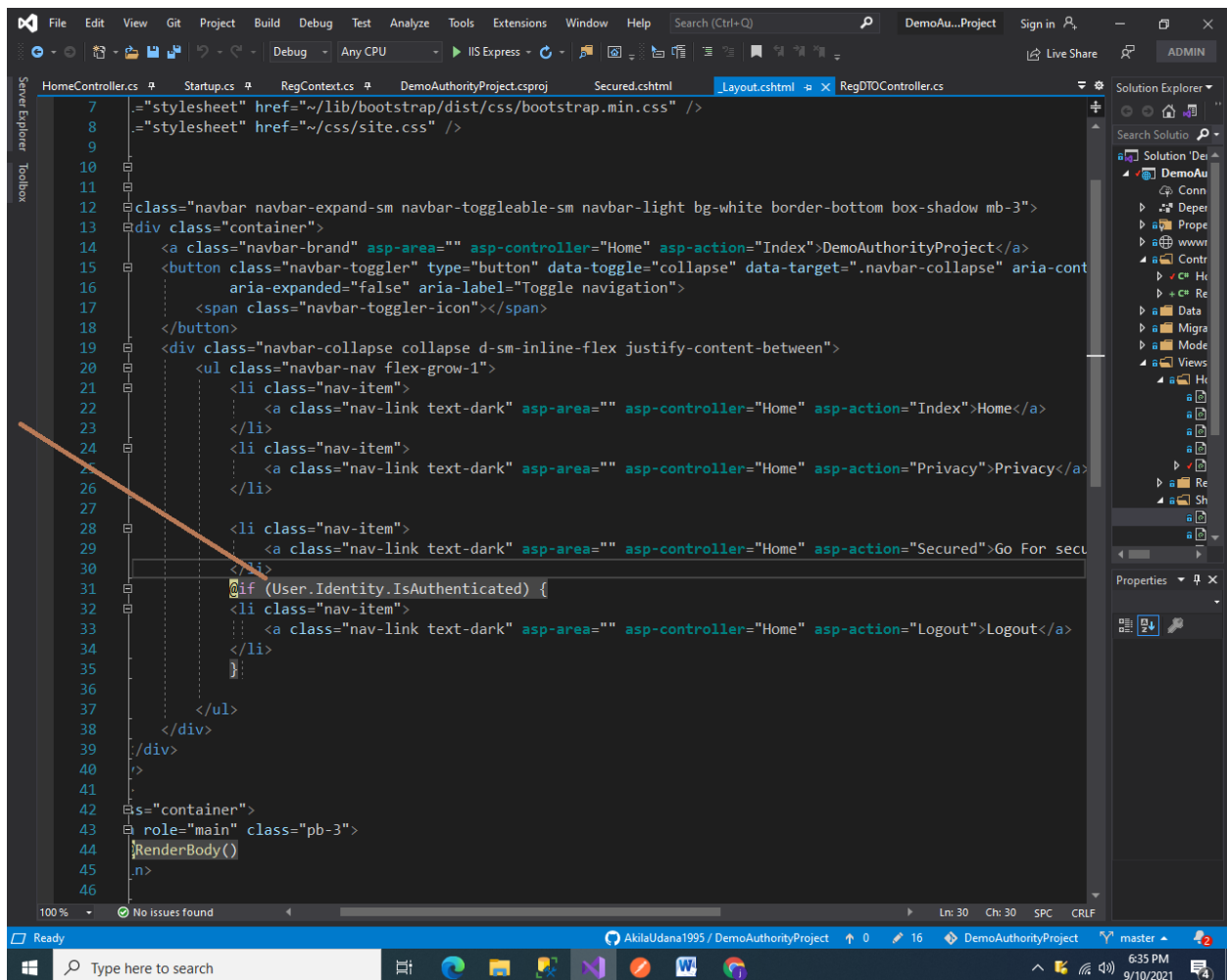
Here I have just checked with hard coding by giving username as "AAA" and
password as '123',

I have made login method as Authorize using below code,

```
[HttpGet("login")]
    public IActionResult login(string returnUrl)
    {
        ViewData["ReturnUrl"] = returnUrl;
        return View();

    }
```

Then I have created view for Login…

Then I have added this method to configure service. This method gets called by the runtime. Use this method to add services to the container.

```
//public void ConfigureServices(IServiceCollection services)
    //{
    //    services.AddControllersWithViews();
    //    // services.AddAuthentication().AddCookie();
    //
services.AddAuthentication(CookieAuthenticationDefaults.AuthenticationScheme).AddCookie(o
ptions =>
    //    {

    //        options.LoginPath = "/login";
    //        options.AccessDeniedPath = "/denied";

    //        options.Events = new CookieAuthenticationEvents()
    //        {
    //            OnSigningIn = async context =>
    //            {
    //                var principal = context.Principal;
    //                if(principal.HasClaim(c=>c.Type==ClaimTypes.NameIdentifier))
    //                {
    //
if(principal.Claims.FirstOrDefault(c=>c.Type==ClaimTypes.NameIdentifier).Value=="AAA")
    //                    {
    //                        var claimsIdentity = principal.Identity as
ClaimsIdentity;
    //                        claimsIdentity.AddClaim(new Claim(ClaimTypes.Role,
"Admin"));
    //                    }
    //                }
    //                await Task.CompletedTask;
    //            },
```

```
//          OnSignedIn = async context =>
//            {
//                await Task.CompletedTask;
//            },


//            OnValidatePrincipal= async context=>
//            {
//                await Task.CompletedTask;
//            }

//        };
```

In here I have used cookie authentication events,

I have implemented them to below 3 states,

1. OnSigningIn
2. OnSignedIn
3. OnValidatePrincipal

This procedure is I just only used to make me better understand and also to check how this work,
After that I have created Google API project to integrate my sample application with that, that help me to use Auth token,
So firstly I have added Google authentication for my project via Nugget packages,
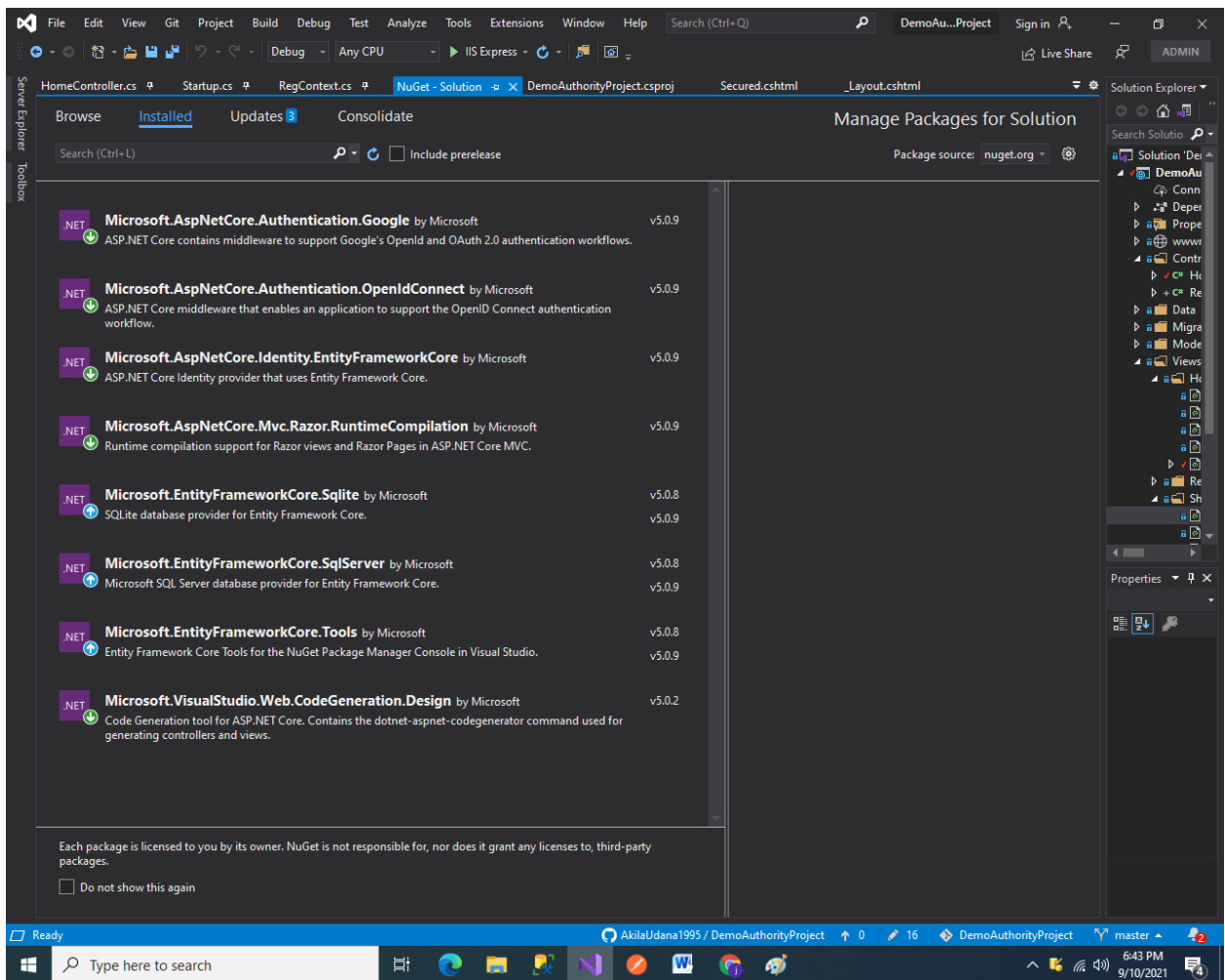
After that I have added Google options to my sample application,

```
//      .AddGoogle(options =>
        //{
        //      options.ClientId = "78010272082-
7ru4pa608258v7lfskpfq273ca1l3es7.apps.googleusercontent.com";
        //      options.ClientSecret = "Pg94giXkz_mLAFhi0F1GBBbP";
        //      options.CallbackPath = "/auth";
        //      options.AuthorizationEndpoint += "?promt=consent";  //this for select
user account after logout from the current context page
        //});     //This is Google open handler that has made with oauth 2.0
```

7ru4pa608258v7lfskpfq273ca1l3es7.apps.googleusercontent.com is client id

Pg94giXkz_mLAFhi0F1GBBbP is client secret

After I have made application like that by adding this simple code,
If user logged through Google account is has to authorized,

```
[Authorize(Roles ="Admin")]

    //[Authorize]

        public async Task<IActionResult> Secured()
        {
            var idToken = await HttpContext.GetTokenAsync("id_token");  //this token is
the type of JWT or JOT
            return View();
        }
```
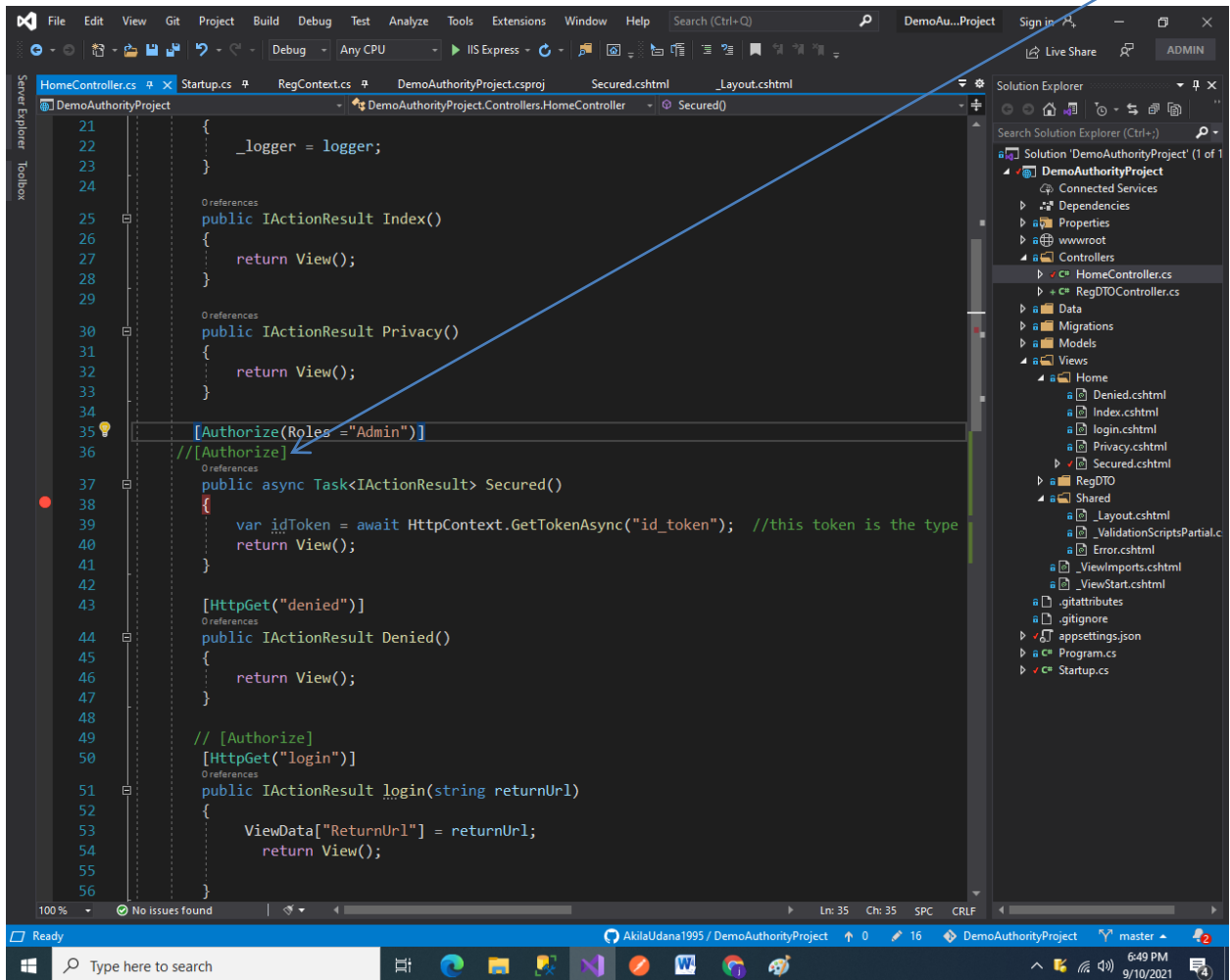
That ensures that logged user is authorized or not,
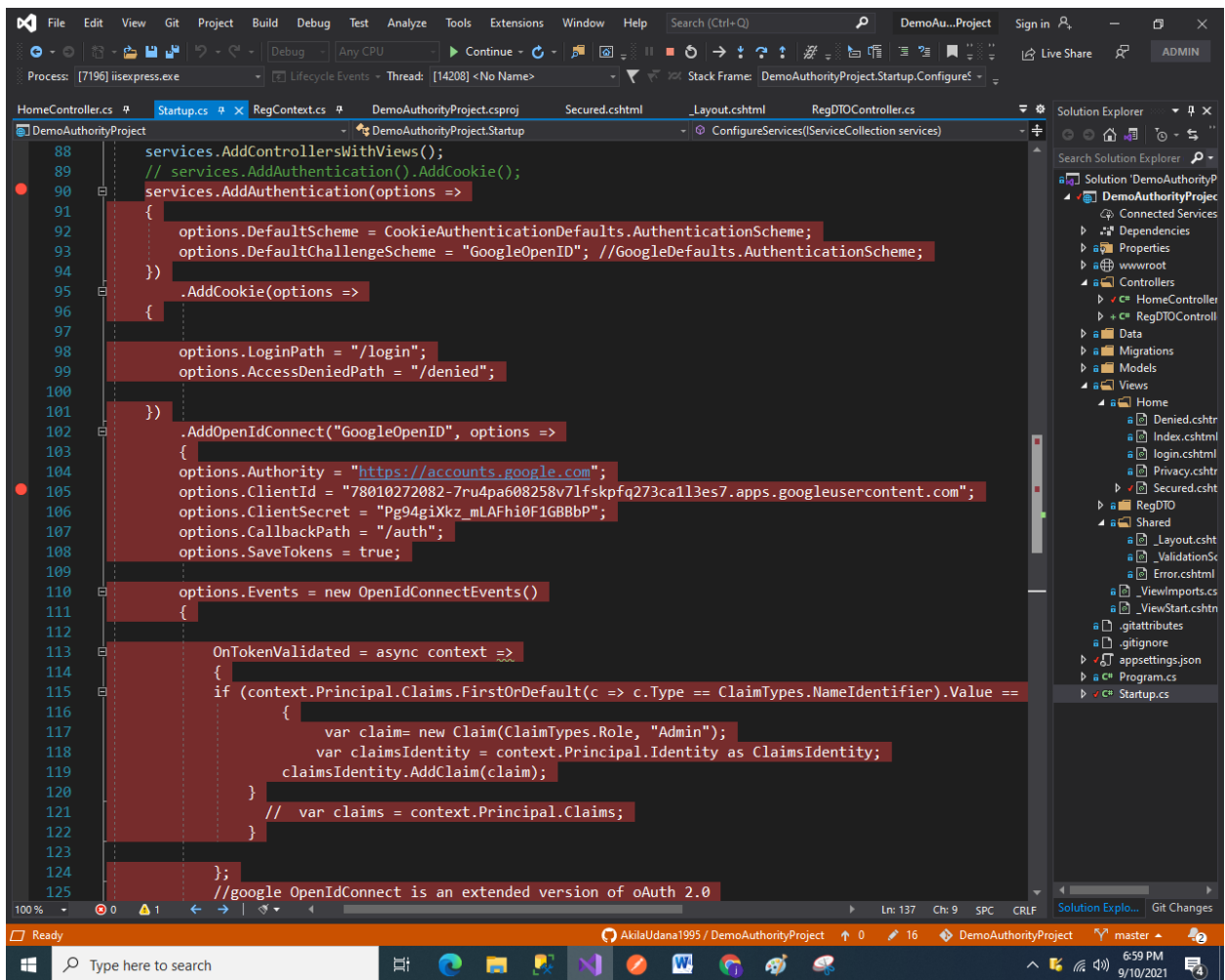For now I have commented "role based authorization".

I created authentication handlers for this, I have used Google search for this,

The figure is also taken from Google.

After that I also used generic openId connect for this, because that is extended version.
To that I have installed "MicrosoftAspNetcore.Authentication" then choose "OpenIdConnect."

```
88          services.AddControllersWithViews();
89          // services.AddAuthentication().AddCookie();
90          services.AddAuthentication(options =>
91          {
92              options.DefaultScheme = CookieAuthenticationDefaults.AuthenticationScheme;
93              options.DefaultChallengeScheme = "GoogleOpenID"; //GoogleDefaults.AuthenticationScheme;
94          })
95          .AddCookie(options =>
96          {
97
98              options.LoginPath = "/login";
99              options.AccessDeniedPath = "/denied";
100
101          })
102          .AddOpenIdConnect("GoogleOpenID", options =>
103          {
104              options.Authority = "https://accounts.google.com";
105              options.ClientId = "78010272082-7ru4pa608258v7lfskpfq273ca1l3es7.apps.googleusercontent.com";
106              options.ClientSecret = "Pg94giXkz_mLAFhi0F1GBBbP";
107              options.CallbackPath = "/auth";
108              options.SaveTokens = true;
109
110              options.Events = new OpenIdConnectEvents()
111              {
112
113                  OnTokenValidated = async context =>
114                  {
115                  if (context.Principal.Claims.FirstOrDefault(c => c.Type == ClaimTypes.NameIdentifier).Value ==
116                      {
117                          var claim= new Claim(ClaimTypes.Role, "Admin");
118                          var claimsIdentity = context.Principal.Identity as ClaimsIdentity;
119                          claimsIdentity.AddClaim(claim);
120                      }
121                  //  var claims = context.Principal.Claims;
122                      }
123
124                  };
125              //google OpenIdConnect is an extended version of oAuth 2.0
```
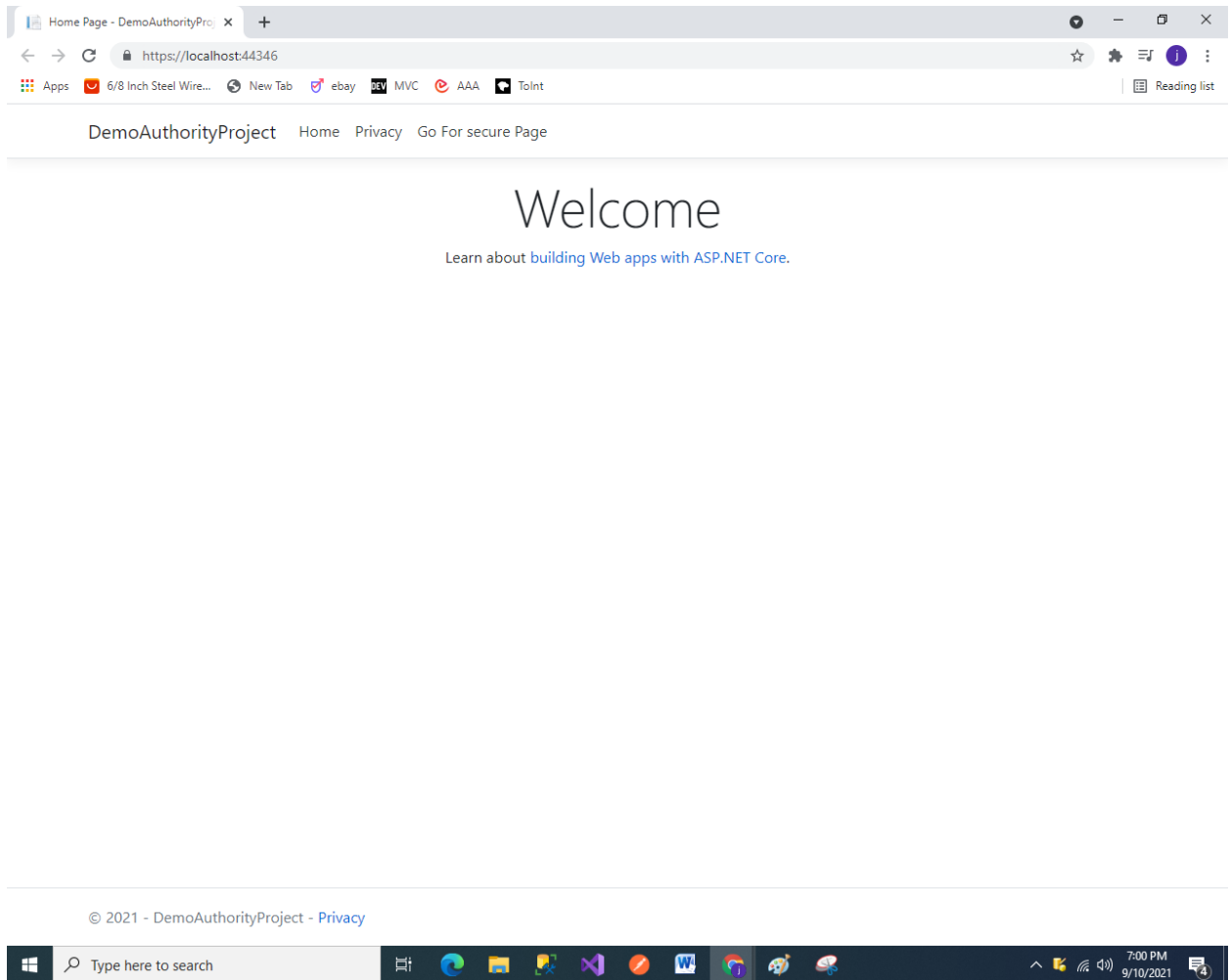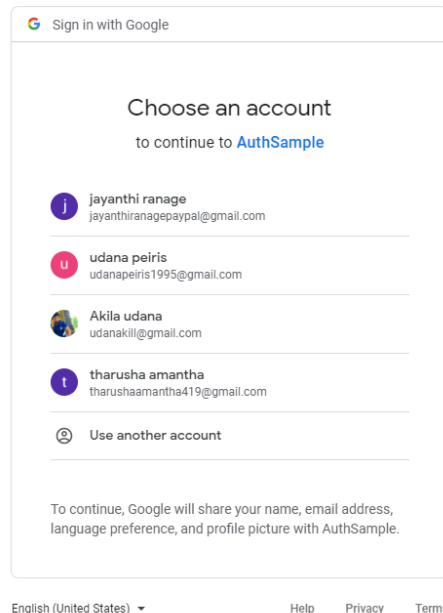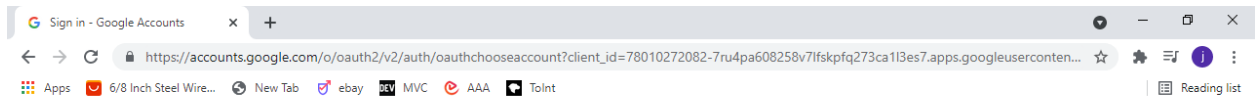
After it walked me to this output.

Now Google API is successfully connected and it asked me to select Google account to proceed,

After I select Google account, the break point what I put at
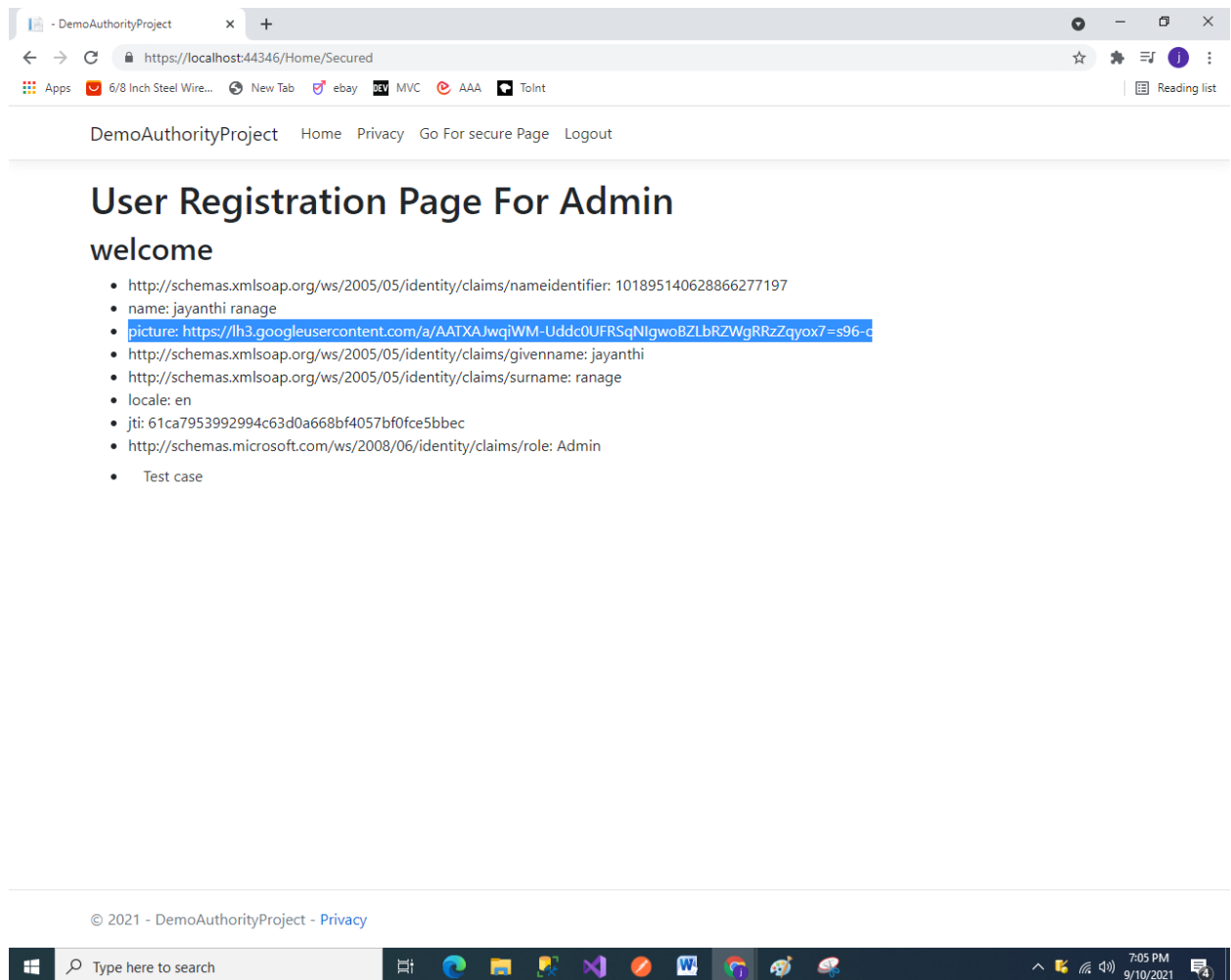
```
    [Authorize(Roles ="Admin")]
 //[Authorize]
    public async Task<IActionResult> Secured()
    {
        var idToken = await HttpContext.GetTokenAsync("id_token");  //this token is
the type of JWT or JOT
        return View();
    }
```

Is fired, that means my application is working for now.
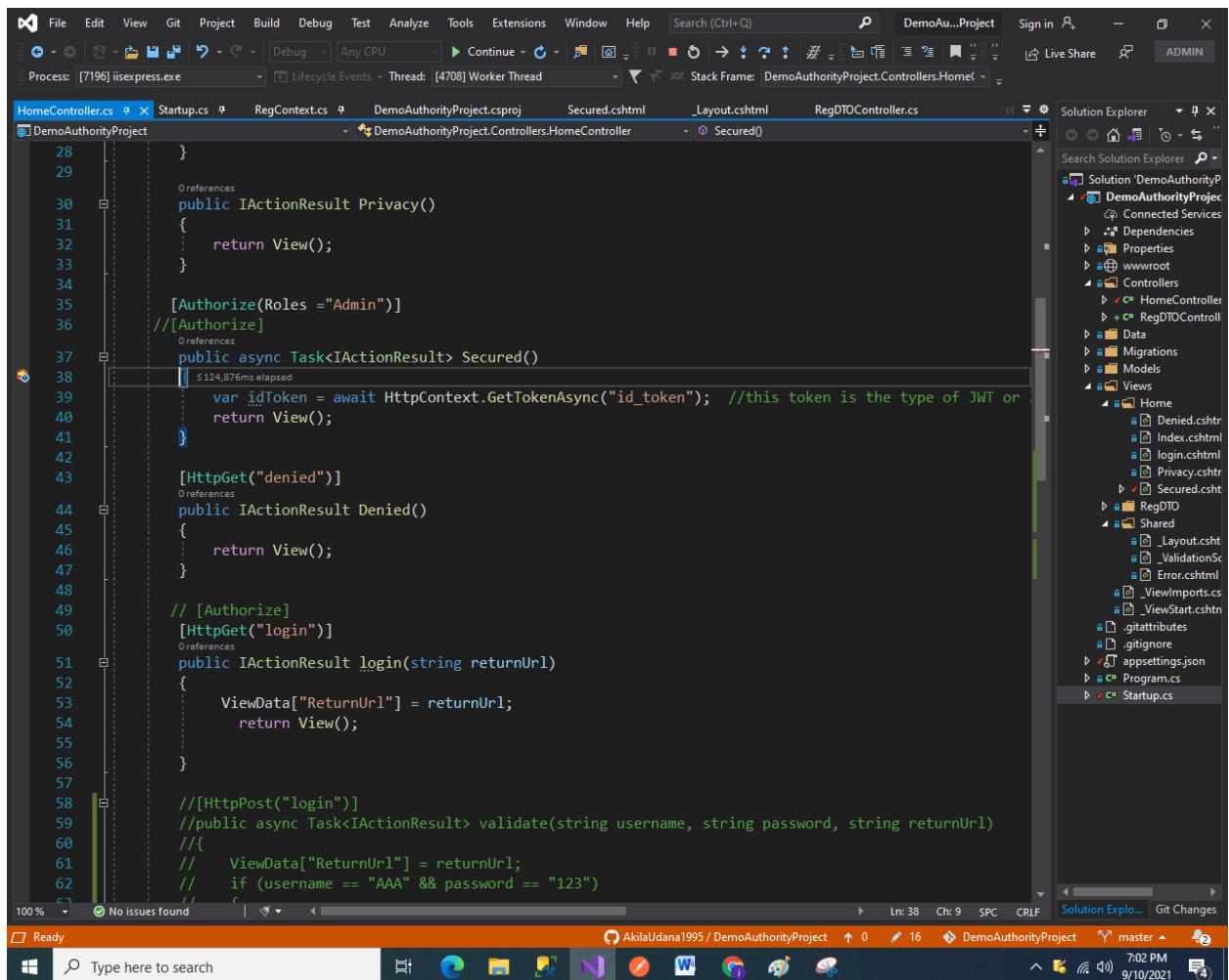
Another advantage is openID is that shows our account picture as well,

User Registration Page For Admin

welcome

- http://schemas.xmlsoap.org/ws/2005/05/identity/claims/nameidentifier: 101895140628866277197
- name: jayanthi ranage
- picture: https://lh3.googleusercontent.com/a/AATXAJwqiWM-Uddc0UFRSqNIgwoBZLbRZWgRRzZqyox7=s96-c
- http://schemas.xmlsoap.org/ws/2005/05/identity/claims/givenname: jayanthi
- http://schemas.xmlsoap.org/ws/2005/05/identity/claims/surname: ranage
- locale: en
- jti: 61ca7953992994c63d0a668bf4057bf0fce5bbec
- http://schemas.microsoft.com/ws/2008/06/identity/claims/role: Admin

- Test case

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picture: https://lh3.googleusercontent.com/a/AATXAJwqiWM-Uddc0UFRSqNIgwoBZLbRZWgRRzZqyox7=s96-c

here it shows as link,

if I do a brief explain about the content what I see here is

http://schemas.xmlsoap.org/ws/2005/05/identity/claims/nameidentifier:
101895140628866277197   this is name identifier for my case.

After that I have added a JWT token,

```
var idToken = await HttpContext.GetTokenAsync("id_token");
```
//this token is the type of JWT or JOT

I have searched this in internet and found,
That is used JSON notation to embedded Authentication and Authorization Claims in applications…

By further I have figure out that chat is made with major 3 parts,
1. Header
2. PayLoad
3. Signature

1.Header : this is containing information about the type of token. It could be JWT or JOT and also regarding the algorithm used to encrypt the signature.
2.PayLoad: This is contain the auth claims

3.Signature: this is an encrypted block of data which will be used to verify the authenticity of the token.

By further I have learned that these 3 parts are separated by (.).

After run this My token was

"eyJhbGciOiJSUzI1NiIsImtpZCI6Ijk5MWIwNjM2YWFkYTM0MWM1YTA4ZTBkOGYyNDA2OTcyMD
Y0ZGM4ZWQiLCJ0eXAiOiJKV1QifQ.eyJpc3MiOiJodHRwczovL2FjY291bnRzLmdvb2dsZS5jb20iLCJ
henAiOiI3ODAxMDI3MjA4Mi03cnU0cGE2MDgyNTh2N2xmc2twZnEyNzNjYTFsM2VzNy5hcHBzL
mdvb2dsZXVzZXJjb250ZW50LmNvbSIsImF1ZCI6Ijc4MDEwMjcyMDgyLTdydTRwYTYwODI1OHY3b
GZza3BmcTI3M2NhMWwzZXM3LmFwcHMuZ29vZ2xldXNlcmNvbnRlbnQuY29tIiwic3ViIjoiMTAx
ODk1MTQwNjI4ODY2Mjc3Mtk3Iiwibm9uY2UiOiI2Mzc2Njg3ODM4NDI4NDUzMzMuTlRKaU1UU
mxPR1F0TnpFd1ppMDBaREF5TFdJek1qQXROV016TnpobE0yWmtNMk0xWWpWbVkyRTJZall0T
UdJMk55MDBOREkxTFRnM01XSXRaRFJoWkRkbU0ySXpOR1V3IiwibmFtZSI6ImpheWFudGhpIHJ
hbmFnZSIsInBpY3R1cmUiOiJodHRwczovL2xoMy5nb29nbGV1c2VyY29udGVudC5jb20vYS9BQVR
YQUp3ClXTS1VZGRjMFVGUlNxTklnd29CWkxiUlpXZ1JSelpxeW94Nz1zOTYtYyIsImdpdmVuX25h
bWUiOiJqYXlhbnRoaSIsImZhbWlseV9uYW1lIjoicmFuYWdlIiwibG9jYWxlIjoiZW4iLCJpYXQiOjE2Mz
EyODE1NjAsImV4cCI6MTYzMTI4NTE2MCwianRpIjoiNmI5MDQ4ZDc5MTVlODA3ZTMyZjljYjAwN
DEyMzhlNDdlYjY4NTBiNiJ9.JppTJBLdcIMZ4QN6QLFRwepU1vcvWJ2uZ-
hzCtqnRo2iYr0_CR4A9D91hBDFMviM5b_Gr5VBm0G8TreqlVKOCXvLcbJz7amkUPCJwZtFwUVVbL
tHLo-IBq7V4-

F33R8LwfO3yEGGfPoQKBICBvGjfiWw41K1ZXMS2u4ysjjK89tkFrXhcxUo3GEEpwVo2Rb8NXLHkxa
oTww8y6b7qvUDsfOaIj2if2GJ9pm9MWIiYBYbq8SAUqAB6h-
pnrs3EWwWeIFTZTK6PiZ_M0tCHuIbFaU-
KAAUzkmHLhxKanLGk0wGbSeGquAzr3s6oQX94xfPq0fxAoG--KM9AtRhxl_FsA"

This token is in the form of JWT or JOT.

Even these details might not be irrelevant for the task what you gave me, but before that I have not implement this , So I am documenting what I have learned,

These things were all new things for me…

So have gone to https://jwt.io/ and pasted my encrypted token and got decrypted details,
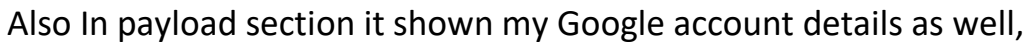
Also In payload section it shown my Google account details as well,

PAYLOAD: DATA

```
{
  "iss": "https://accounts.google.com",
  "azp": "78010272082-
7ru4pa608258v7lfskpfq273ca1l3es7.apps.googleusercontent
.com",
  "aud": "78010272082-
7ru4pa608258v7lfskpfq273ca1l3es7.apps.googleusercontent
.com",
  "sub": "101895140628866277197",
  "nonce":
"637668783842845333.NTJiMTRlOGQtNzEwZi00ZDAyLWIzMjAtNWM
zNzhlM2ZkM2M1YjVmY2E2YjYtMGI2Ny00NDI1LTg3MWItZDRhZDdmM2
IzNGUw",
  "name": "jayanthi ranage",
  "picture":
"https://lh3.googleusercontent.com/a/AATXAJwgiWM-
Uddc0UFRSqNIgwoBZLbRZWgRRzZqyox7=s96-c",
  "given_name": "jayanthi",
  "family_name": "ranage",
  "locale": "en",
  "iat": 1631281560,
  "exp": 1631285160,
  "jti": "6b9048d7915e807e32f9cb0041238e47eb6850b6"
}
```

Also it has shown me as signature is verified now.

JWT

Debugger   **Libraries**   Introduction   Ask   Get a T-shirt!   Crafted by **Auth0**

0G8TreqlVKOCXvLcbJz7amkUPCJwZtFwUVVbLtH
Lo-IBq7V4-
F33R8Lwf03yEGGfPoQKBICBvGjfiWw41K1ZXMS2
u4ysjjK89tkFrXhcxUo3GEEpwVo2Rb8NXLHkxao
Tww8y6b7qvUDsf0aIj2if2GJ9pm9MWIiYBYbq8S
AUqAB6h-
pnrs3EWwWeIFTZTK6PiZ_M0tCHuIbFaU-
KAAUzkmHLhxKanLGk0wGbSeGquAzr3s6oQX94xf
Pq0fxAoG--KM9AtRhxl_FsA

```
RSASHA256(
  base64UrlEncode(header) + "." +
  base64UrlEncode(payload),
```

-----BEGIN PUBLIC KEY-----
MIIBIjANBgkqhkiG9w0BAQEFAAOC
AQ8AMIIBCgKCAQEAr3WAFM8oV43
b/koyZLa+

Private Key. Enter it in plain
text only if you want to gener
ate a new token. The key never
leaves your browser.

)

⊘ **Signature Verified**

SHARE JWT

Libraries for Token Signing/Verification

Filter by   All

Type here to search   7:31 PM 9/10/2021

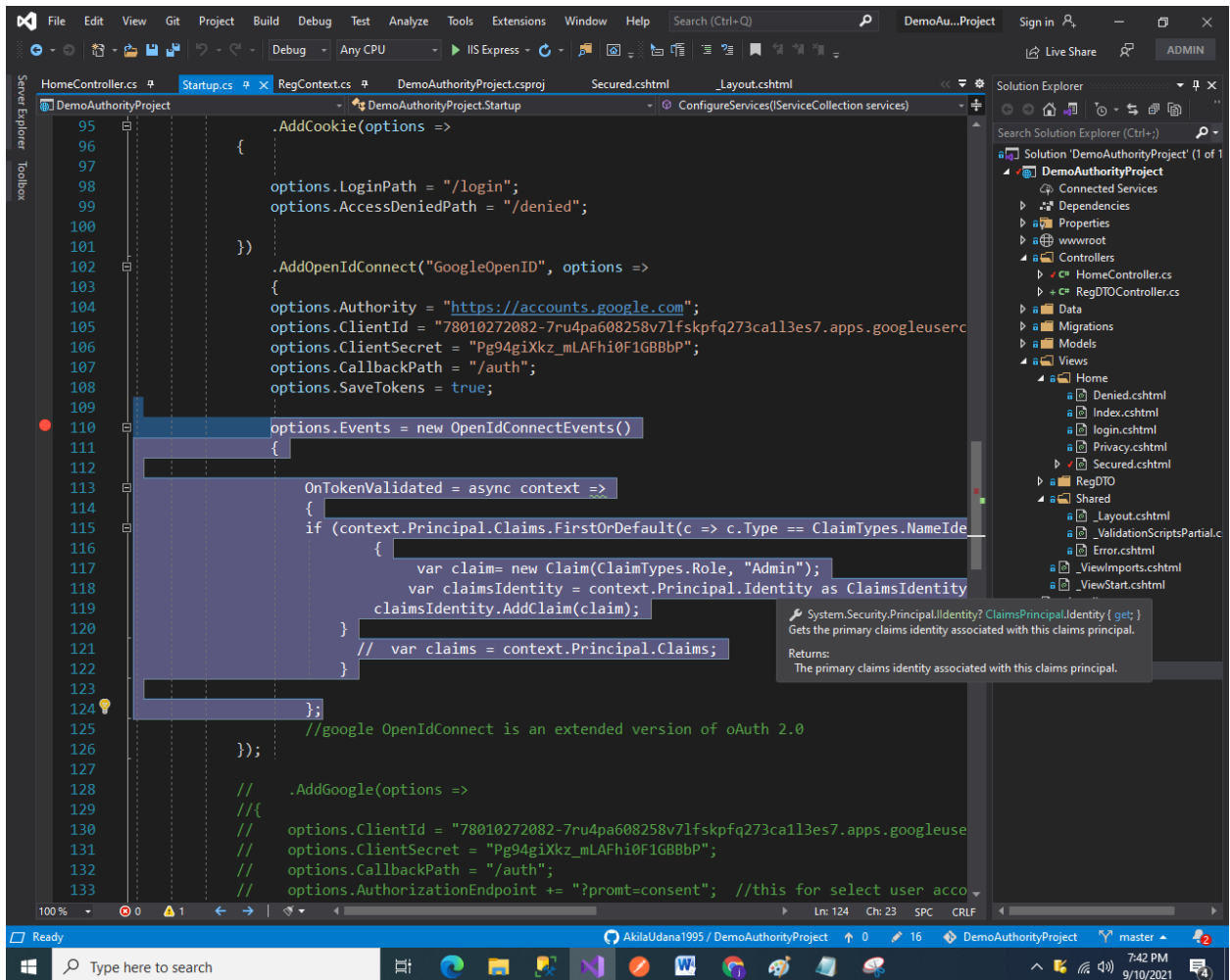I have learned that 3 sections are separated by (.), then I have taken Payload section and walked through, https://revoltjs.org/utilities to get encode it again and see more,

I have decoded the encoded text and made simple change to my name in there,

Then I changed my name "Jayanthi" as "Jayanthi 123.". after I have again encoded that message

After that I again gone jwt.io and pasted , now that shown to me my signature of token as "INVALID".

ZXVzZXJjJjb250ZW50Lmb5SIsImF1ZCI6Ijc4MDE
wMjcyMDgyLTdydTRwYTYwODI1OHY3bGZza3BmcT
I3M2NhMWwzZXM3LmFwcHMuZ29vZ2xdXNlcmNvb
nRlbnQuY29tIiwic3ViIjoiMTAxODk1MTQwNjI4
ODY2Mjc3MTk3Iiwibm9uY2UiOiI2Mzc2Njg3ODM
4NDI4NDUzMzMuMuTlRKaU1UUmxPR1F0TnpFd1ppMD
BaREF5TFdJek1qQXROV016TnpobkE0yWmtNMk0xW
WpWbVkyRTJZal0TUdJMk55MDBOREkxTFRnM01X
SXRaRFJoWkRkbU0ySXpOR1V3IiwibmFtZSI6Imp
heWFudGhpIHJhbmFnZSIsInBpY3R1cmUiOiJodH
RwczovL2xoMy5nb29nbGV1c2VyY29udGVudC5jb
20vYS9BQVRYQUp3c3W1XTS1VZGRjMFVGUGlNTktln
d29CWkxiUlpXZ1JSelpxeW94Nz1zOTYtYYIsImd
pdmVuX25hbWUiOiJqYXlhbnRoaSSAxMjLCJmYW
1pbH1fbmFtZSI6InJhbmFnZSIsImxvY2FsZSI6I
mVuIiwiaWF0IjoxNjMxMjgxNTYwLCJleHAiOjE2
MzEyODUxNjAsImp0aSI6IjZiZiOTA0OGQ3OTE1ZTg
wN2UzMmY5Y2IwMDQxMjM4ZTQ3ZWI2ODUwYjYifQ
.JppTJBLdcIMZ4QN6QLFRwepU1vcvWJ2uZ-
hzCtqnRo2iYr0_CR4A9D91hBDFMviM5b_Gr5VBm

u�\u0010�2����U�A�A�N���R�\t{�q�s���P����E
�EU1�G.��\u0006����w�\u001f\u000b����A�|
�\u0010(\u0012\u0002\u0006��~%��R�es\u0012��2�8��
�d\u0016��s\u0015(�a\u0004�\u0005h�\u0016�5rÛ\u0016
�0\f<1���\u0003���\"=�·a����1b\" \u0016\u001b�ÃR
�\u0001�\u001f���7\u0011l\u0016x�Se2�>&·3KB\u001e�
\u001b\u0015�>
(\u0000\u0014�I�.\u001cJjrGL\u0006m'���3�{:�\u0005
��\u0017ɽG�\u0002����=\u0002�a�_Û"

VERIFY SIGNATURE

```
RSASHA256(
    base64UrlEncode(header) + "." +
    base64UrlEncode(payload),
    -----BEGIN PUBLIC KEY-----
    MIIBIjANBgkqhkiG9w0BAQEFAAOC
    AQ8AMIIBCgKCAQEAr3WAFM8oV43
    b/koyZLa+

    Private Key. Enter it in plain
    text only if you want to gener
    ate a new token. The key never
    leaves your browser.

)
```

⊗ Invalid Signature

SHARE JWT

Finally in home controller I have added role is [Authentication] and modified it also in startup.cs like blow,

```csharp
options.Events = new OpenIdConnectEvents()
{

    OnTokenValidated = async context =>
    {
    if (context.Principal.Claims.FirstOrDefault(c => c.Type ==
ClaimTypes.NameIdentifier).Value == "101895140628866277197")
        {
            var claim= new Claim(ClaimTypes.Role, "Admin");
            var claimsIdentity = context.Principal.Identity as
ClaimsIdentity;
            claimsIdentity.AddClaim(claim);
    }
      //  var claims = context.Principal.Claims;
    }
```
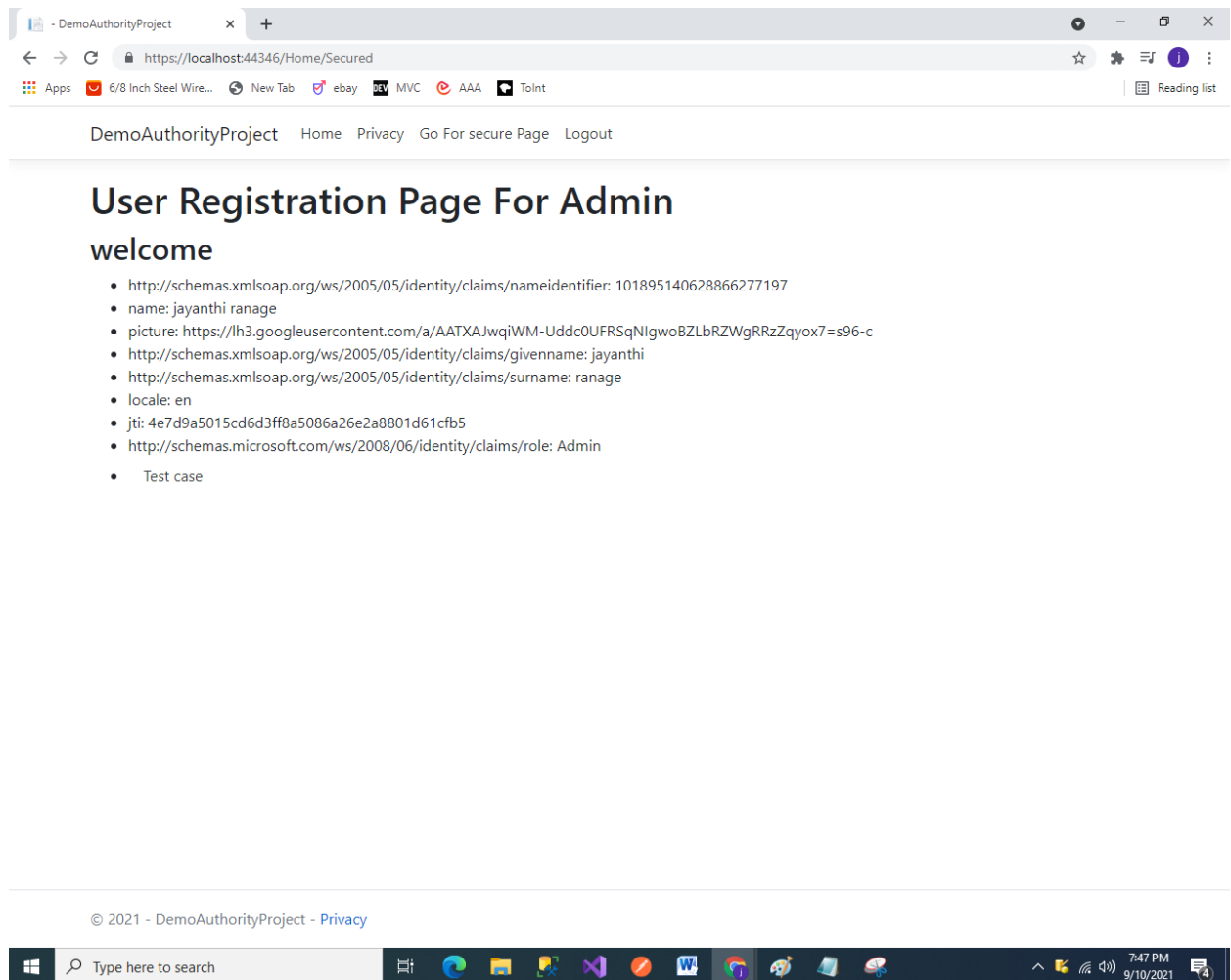
```
                                };

95            .AddCookie(options =>
96        {
97
98                options.LoginPath = "/login";
99                options.AccessDeniedPath = "/denied";
100
101        })
102            .AddOpenIdConnect("GoogleOpenID", options =>
103        {
104            options.Authority = "https://accounts.google.com";
105            options.ClientId = "78010272082-7ru4pa608258v7lfskpfq273ca1l3es7.apps.googleuserc
106            options.ClientSecret = "Pg94giXkz_mLAFhi0F1GBBbP";
107            options.CallbackPath = "/auth";
108            options.SaveTokens = true;
109
110            options.Events = new OpenIdConnectEvents()
111            {
112
113                OnTokenValidated = async context =>
114                {
115                    if (context.Principal.Claims.FirstOrDefault(c => c.Type == ClaimTypes.NameIde
116                    {
117                        var claim= new Claim(ClaimTypes.Role, "Admin");
118                        var claimsIdentity = context.Principal.Identity as ClaimsIdentity
119                        claimsIdentity.AddClaim(claim);
120                    }
121                    //  var claims = context.Principal.Claims;
122                }
123
124                };
125                //google OpenIdConnect is an extended version of oAuth 2.0
126            });
127
128        //    .AddGoogle(options =>
129        //{
130        //    options.ClientId = "78010272082-7ru4pa608258v7lfskpfq273ca1l3es7.apps.googleuse
131        //    options.ClientSecret = "Pg94giXkz_mLAFhi0F1GBBbP";
132        //    options.CallbackPath = "/auth";
133        //    options.AuthorizationEndpoint += "?promt=consent";  //this for select user acco
```

Since I have already know my name identifier for Google account named
JAYANTHIRANAGE@PAYPAL.COM that is 101895140628866277197

I have putted it there,
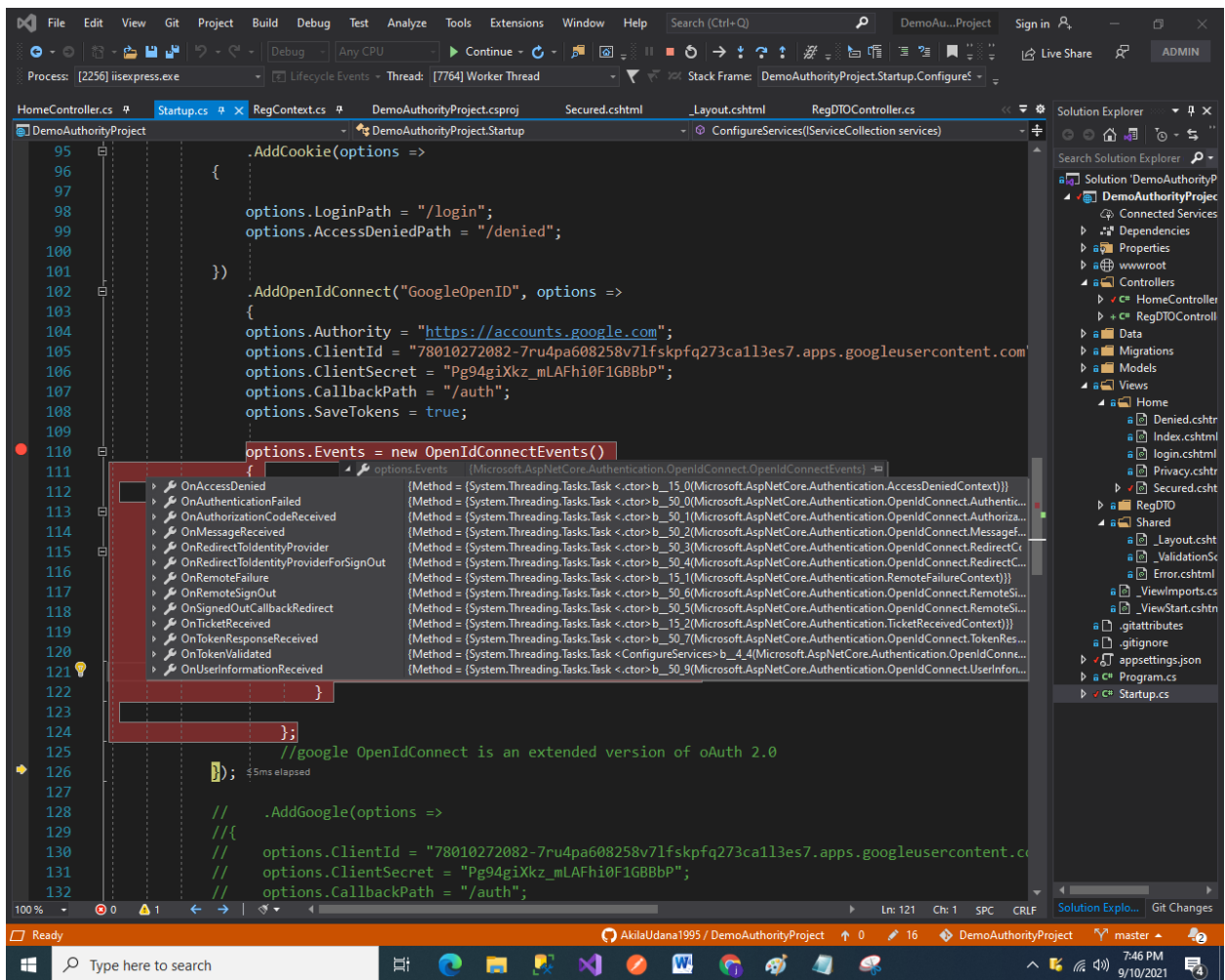
Since I have configured admin rights only for Google account called
jayanthiranage@paypal.com is allow admin access only for that.

Once I have logged out from that and tried to logged to system using another account to admin panel,

Since I have not given admin privileges to other accounts it showed me as below.
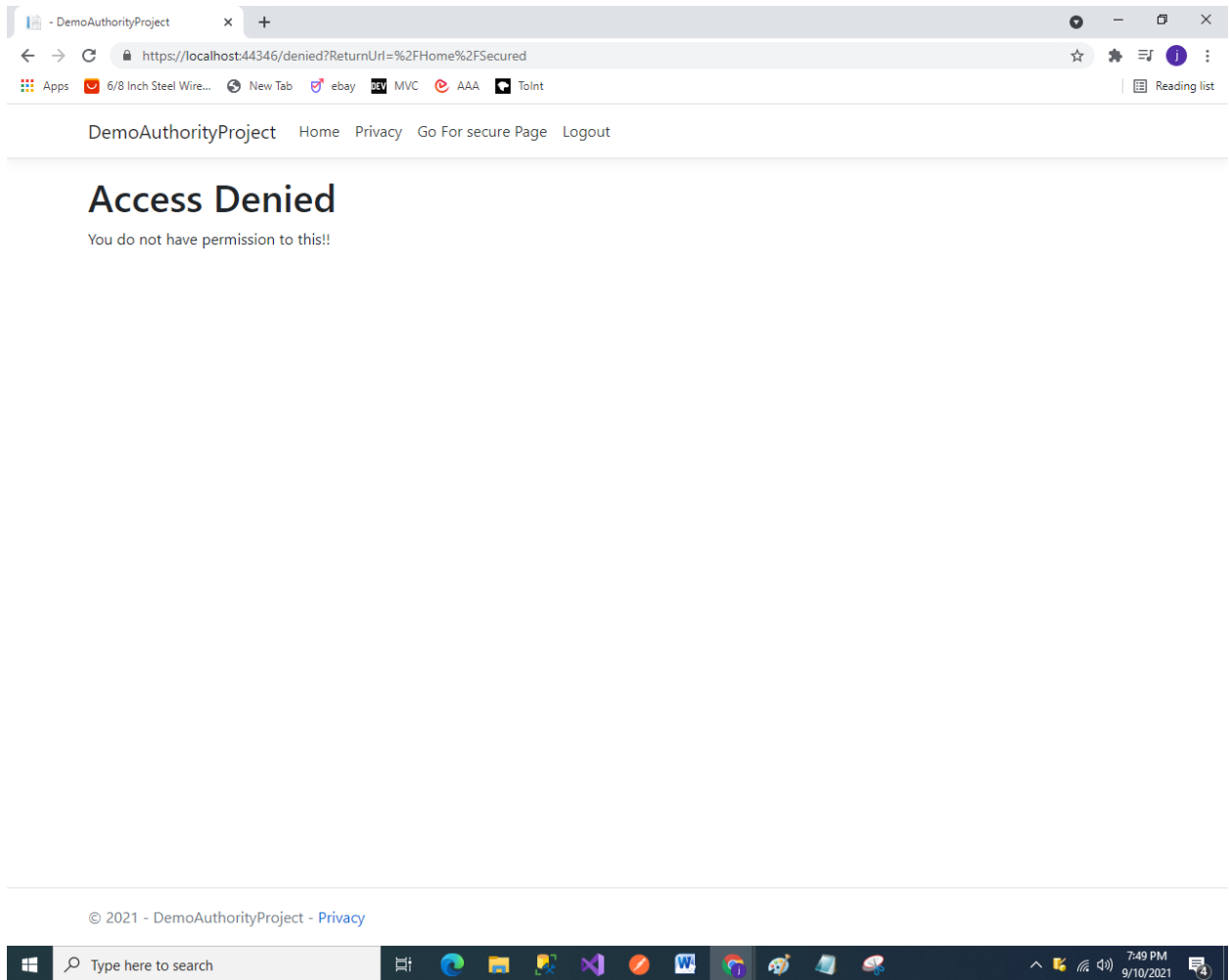
```
.AddCookie(options =>
    {

        options.LoginPath = "/login";

            options.AccessDeniedPath = "/denied";
```

So my all functions are working..

Now I have implanted user authentication and authorization for admin, So now user is able to access system,

Now I have followed this Procedure to add/Update/View and Delete New User.

First I have created Model class to catch up details from front end application.

```csharp
public class RegDTO
    {
        [Key]
        public int UserID { get; set; }
        [Required(ErrorMessage ="This Filed is Required")]
        public string FirstName { get; set; }
        [Required(ErrorMessage = "This Filed is Required")]
        public string LastName { get; set; }
    //  public int Email { get; set; }
    //  public int Password { get; set; }
        public DateTime Bithdate { get; set; }



        public int Status { get; set; }
```

here I have used [key] attribute using ASP.NET core notations and also marked some fields as required as well,

Then After I have created Context class for data base related queries and DB Set,

I have used MSEF Core for this,

Then I have made migration and updated data bases,

After I have created another controller with READ/WRITE actions using entity framework then scaffolds it with Views,

After Debug...for POST Method,
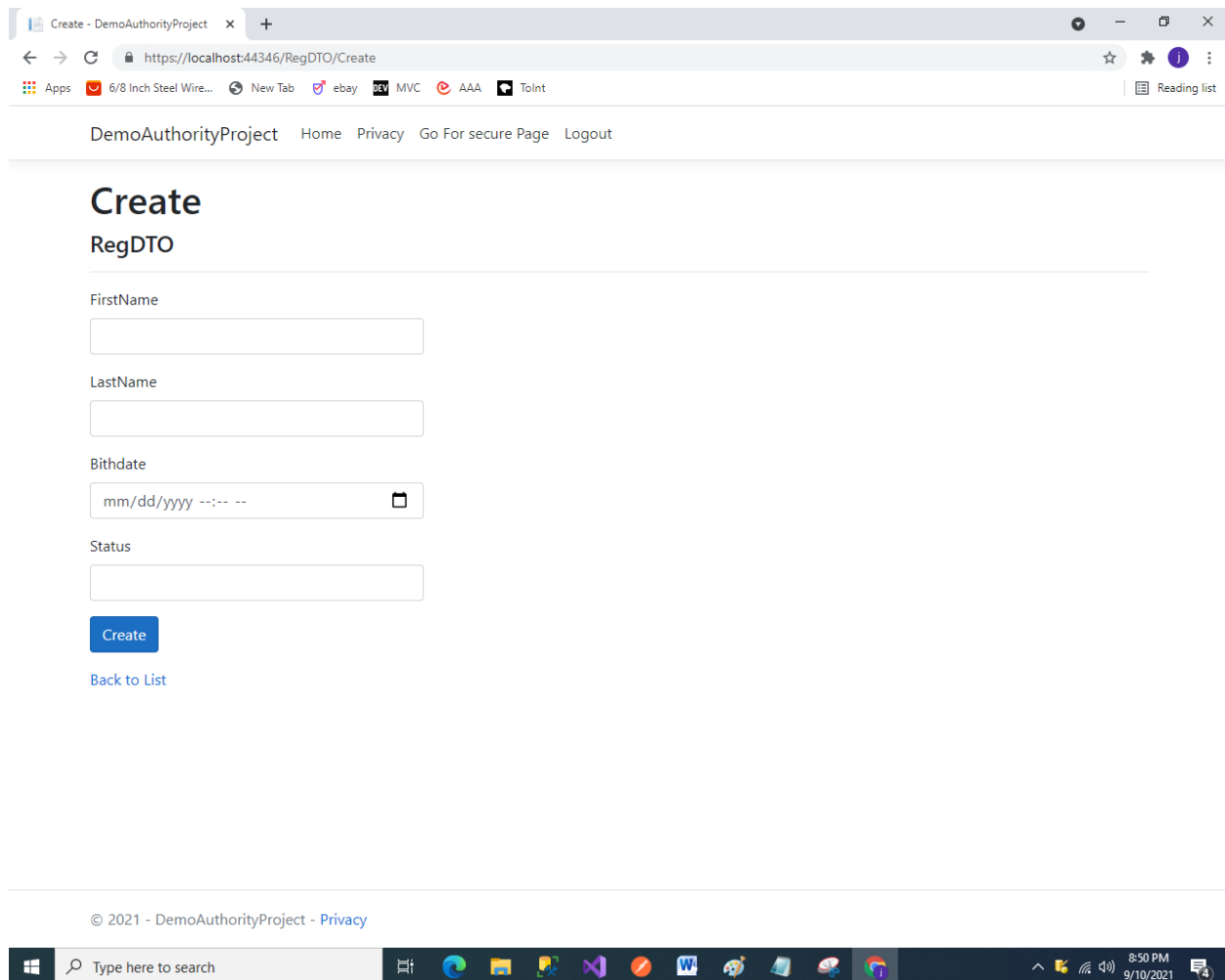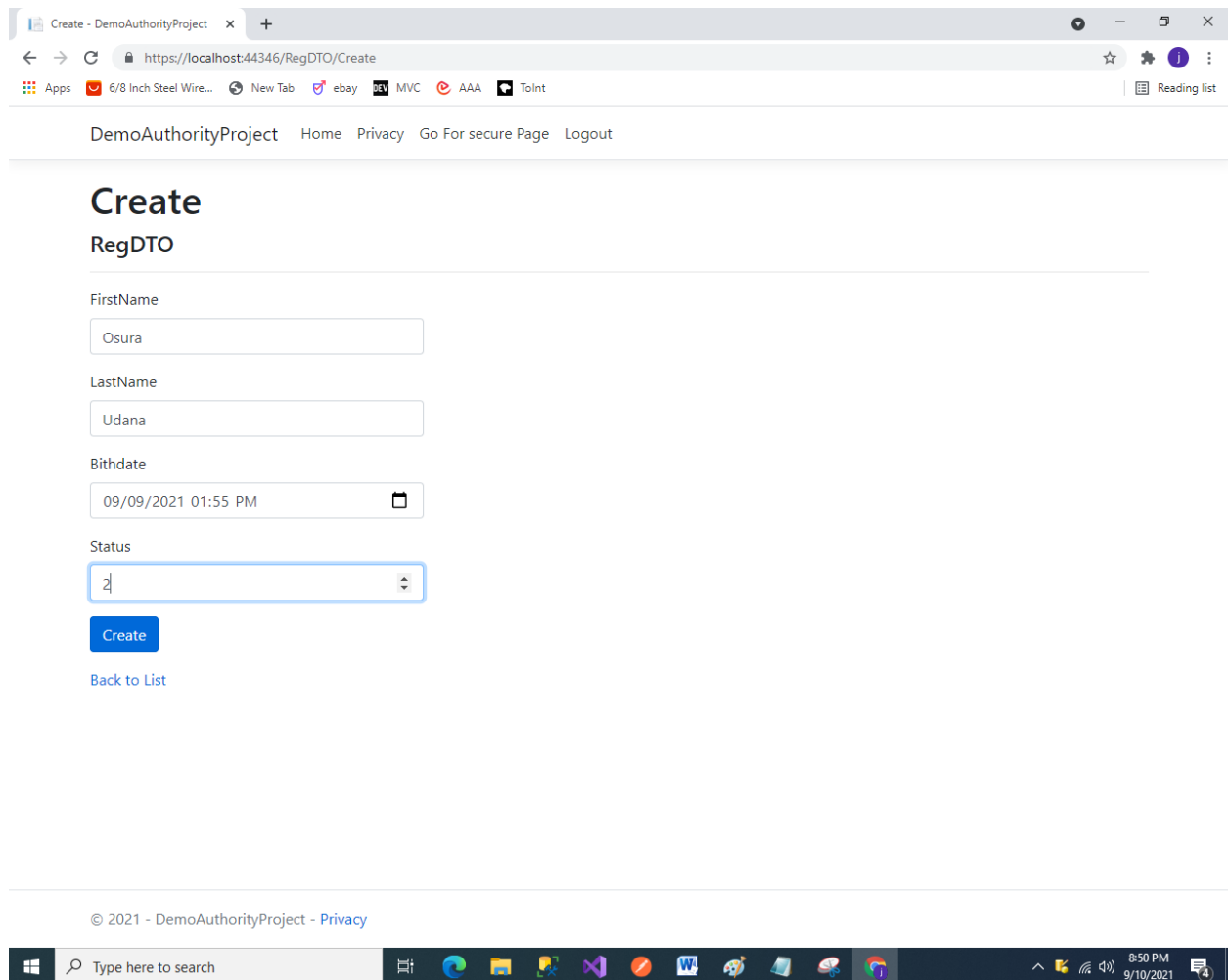
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Create

RegDTO

FirstName

LastName

Bithdate

mm/dd/yyyy --:-- --

Status

Create

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Create

RegDTO

FirstName

Osura

LastName

Udana

Bithdate

09/09/2021 01:55 PM

Status

2

Create

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POST is Working now.

Also In SQL DB side it has also updated too.

Like vice all other methods are working smoothly.

I have added screen shots for other methods too.

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Index

Create New

FirstName	LastName	Bithdate	Status			
Akila ***	Udana*	4/19/1995 4:18:00 PM	2	Edit	Details	Delete
Osura	Udana	9/9/2021 1:55:00 PM	2	Edit	Details	Delete

https://localhost:44346/RegDTO/Details/1

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Details

RegDTO

FirstName	Akila ***
LastName	Udana*
Bithdate	4/19/1995 4:18:00 PM
Status	2

Edit | Back to List

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https://localhost:44346/RegDTO/Delete/2

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Delete

Are you sure you want to delete this?

RegDTO

FirstName	Osura
LastName	Udana
Bithdate	9/9/2021 1:55:00 PM
Status	2

Delete | Back to List

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Thank you!!