React Application SSL Lab

In this lab, let us configure a react app running on a development server to serve requests using the protocol **https!**

We will need to

- Create and develop a new react project OR Use an existing react application
- Generate and Configure server key and ssl certificate
- Install the certificate to a local Certificate Authority
- Configure the **react-scripts start** to use the generated certificate and key

Use an Existing React Application

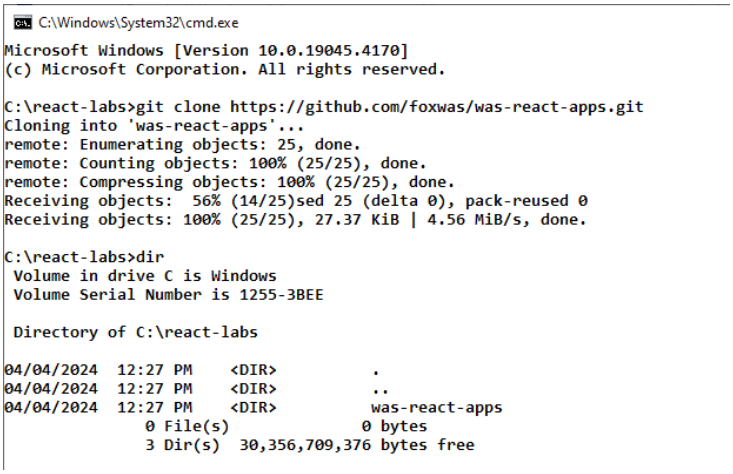
1. Open a command window, create a directory for this lab.

   mkdir react-labs

   cd react-labs

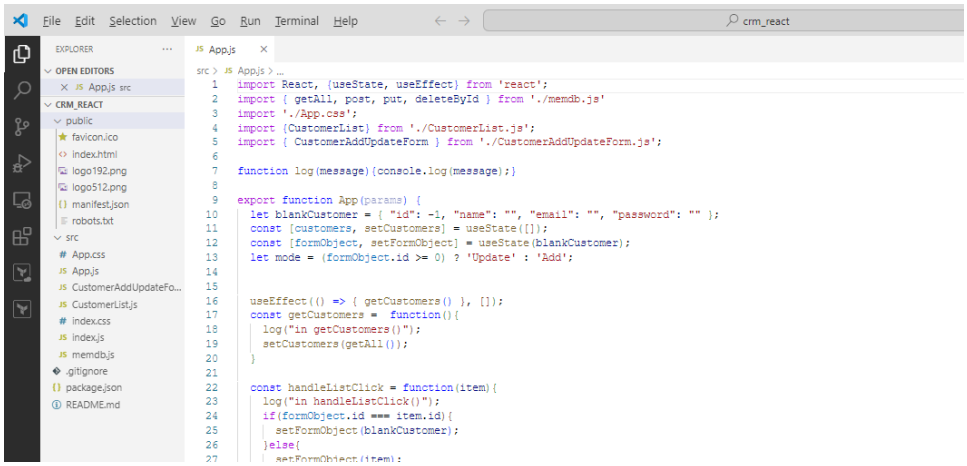
2. Clone the sample react application using the following git command.

   git clone https://github.com/foxwas/was-react-apps.git



3. In this project was-react-apps, let us use the react app: **crm_react**

   Review this react app code.



4. In the command window type the following commands to change the directory to crm_react and then install application dependencies.

   cd crm_react

   npm install

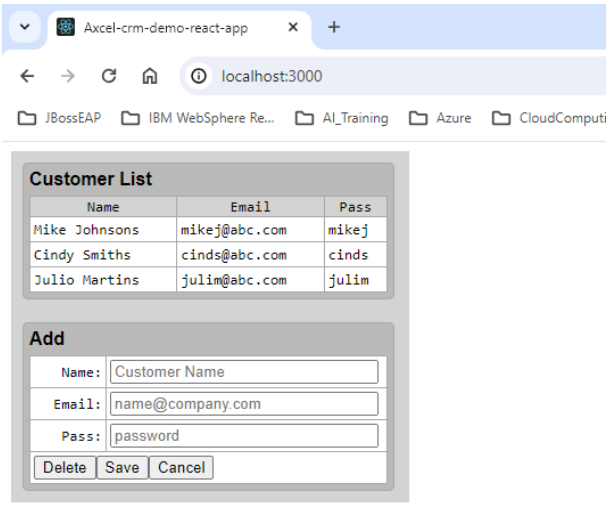
```
C:\react-labs\was-react-apps>cd crm_react

C:\react-labs\was-react-apps\crm_react>npm install
```

5. Launch the react application on a development server using the following command

   npm start

```
Windows PowerShell
Compiled successfully!

You can now view Axcel-crm-demo-react-app in the browser.

  Local:            http://localhost:3000
  On Your Network:  http://192.168.1.76:3000

Note that the development build is not optimized.
To create a production build, use npm run build.

webpack compiled successfully
```

6. Open a browser, go to http://localhost:3000



7. You can view existing customers, update the customers data, and add a new customer. Test the application functional CRUD operations.

Generate and Configure server key and ssl certificate

8. Open another command window, change directory to C:\react-labs\was-react-apps\crm_react

   cd C:\react-labs\was-react-apps\crm_react

   Type the following command to verify the openssl version.

   openssl version

```
C:\Windows\System32\cmd.exe

C:\>cd C:\react-labs\was-react-apps\crm_react

C:\react-labs\was-react-apps\crm_react>openssl version
OpenSSL 3.2.1 30 Jan 2024 (Library: OpenSSL 3.2.1 30 Jan 2024)

C:\react-labs\was-react-apps\crm_react>
```

9. Use openssl tool to Generate self-signed ssl certificate using the following command

   openssl req -x509 -newkey rsa:2048 -nodes -sha256 -keyout server.key -out server.crt

   Enter your data to complete the interactive shell prompts as shown in the following screenshot.

```
C:\Windows\System32\cmd.exe

C:\react-labs\was-react-apps\crm_react>openssl req -x509 -newkey rsa:2048 -nodes -sha256  -keyout server.key -out server.crt
..+.....+.....+...+.....+.....+.....+...+++++++++++++++++++++++++++++++++++++++++++++*..+....+.....++++++++++++++
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You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:US
State or Province Name (full name) [Some-State]:MI
Locality Name (eg, city) []:Farmington Hills
Organization Name (eg, company) [Internet Widgits Pty Ltd]:WebAge Solutions
Organizational Unit Name (eg, section) []:Training
Common Name (e.g. server FQDN or YOUR name) []:
Email Address []:

C:\react-labs\was-react-apps\crm_react>
```

10. This tool will generate **server.key** and **server.crt**. Can you see the files in the current directory?

```
 Directory of C:\react-labs\was-react-apps\crm_react

04/04/2024  01:02 PM    <DIR>          .
04/04/2024  01:02 PM    <DIR>          ..
04/04/2024  12:27 PM               333 .gitignore
04/04/2024  12:42 PM    <DIR>          node_modules
04/04/2024  12:40 PM           602,665 package-lock.json
04/04/2024  12:27 PM               865 package.json
04/04/2024  12:27 PM    <DIR>          public
04/04/2024  12:27 PM             3,429 README.md
04/04/2024  01:02 PM             1,348 server.crt
04/04/2024  01:02 PM             1,732 server.key
04/04/2024  12:27 PM    <DIR>          src
               6 File(s)        610,372 bytes
               5 Dir(s)  30,011,727,872 bytes free

C:\react-labs\was-react-apps\crm_react>
```

11. Use the following openssl command to view the contents in **server.crt**

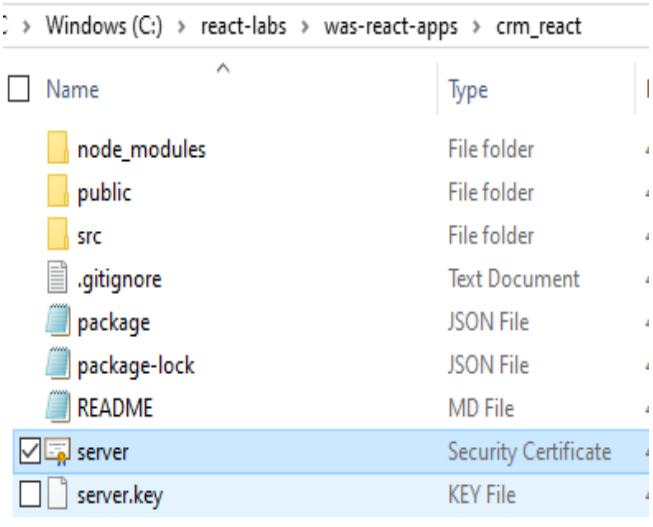
    openssl x509 -in server.crt -noout -text

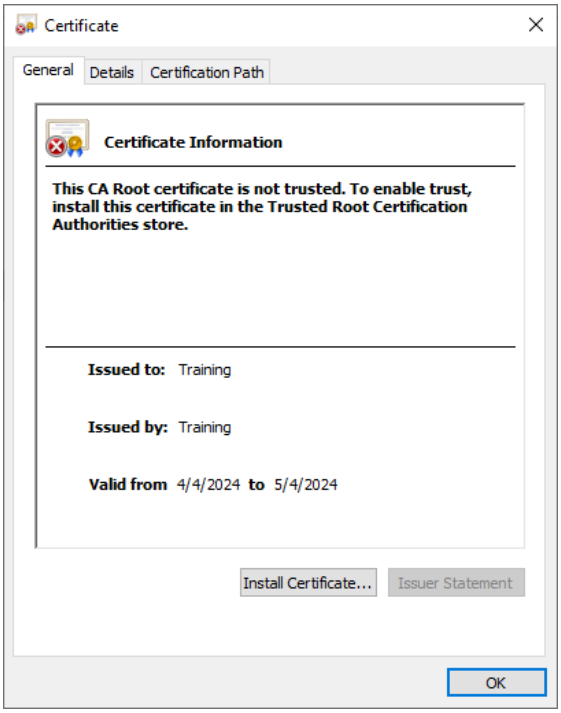
```
C:\Windows\System32\cmd.exe

C:\react-labs\was-react-apps\crm_react>openssl x509 -in server.crt -noout -text
Certificate:
    Data:
        Version: 3 (0x2)
        Serial Number:
            5e:80:1b:c6:e5:ce:89:da:3e:0f:5c:34:d8:9b:a7:2d:20:67:64:67
        Signature Algorithm: sha256WithRSAEncryption
        Issuer: C=US, ST=MI, L=Farmington Hills, O=WebAge Solutions, OU=Training
        Validity
            Not Before: Apr  4 17:02:50 2024 GMT
            Not After : May  4 17:02:50 2024 GMT
        Subject: C=US, ST=MI, L=Farmington Hills, O=WebAge Solutions, OU=Training
        Subject Public Key Info:
            Public Key Algorithm: rsaEncryption
                Public-Key: (2048 bit)
                Modulus:
                    00:ac:02:95:74:e9:fe:23:61:28:28:6d:95:41:ee:
                    0a:92:3e:c2:84:fe:23:94:19:8d:86:e7:91:6f:9d:
                    5b:2e:c8:b4:33:e4:b9:46:70:eb:5b:a3:e2:a2:ed:
                    d1:b9:73:88:ae:f1:0d:76:0e:01:00:a0:77:4f:bc:
                    7e:47:4e:10:42:d6:5c:ab:4e:59:ab:29:99:2c:c5:
                    eb:24:4e:9d:52:db:4c:56:81:fe:5e:dc:91:63:f6:
                    21:57:d5:93:ef:fe:b1:89:40:cc:66:af:2a:00:a6:
                    c4:8b:f9:72:14:dc:cf:73:49:97:7f:71:ea:a5:6b:
                    41:e4:b2:cf:9d:e4:f2:61:03:f9:ac:44:eb:49:70:
                    20:2c:fe:1c:31:25:ae:6d:ee:39:3f:1e:d6:43:3f:
                    b7:6c:bb:9c:16:41:dc:d6:31:f1:94:b8:72:6f:da:
                    59:ed:85:9c:3d:2e:f2:c0:54:47:ff:b7:1d:58:d9:
                    d3:e0:c1:a0:cf:ea:a3:22:dc:a1:7c:d3:86:27:4c:
                    45:61:73:5d:b5:07:f6:b4:73:10:f8:db:09:e8:11:
                    55:14:88:0c:09:2a:9a:68:05:31:2c:ea:5a:a2:0a:
                    d6:e2:32:ac:2d:ce:4b:8a:31:d7:5b:85:a4:d2:13:
                    77:c3:46:f1:53:7f:a7:eb:d3:9b:01:a0:88:73:b0:
                    c4:c7
                Exponent: 65537 (0x10001)
        X509v3 extensions:
            X509v3 Subject Key Identifier:
                8B:D8:4E:04:5F:29:73:FE:FC:6E:F2:A6:43:0A:CA:4B:7D:1F:51:10
            X509v3 Authority Key Identifier:
                8B:D8:4E:04:5F:29:73:FE:FC:6E:F2:A6:43:0A:CA:4B:7D:1F:51:10
            X509v3 Basic Constraints: critical
                CA:TRUE
    Signature Algorithm: sha256WithRSAEncryption
    Signature Value:
        aa:9f:d3:9a:d8:4f:f3:a8:96:24:b1:b1:15:92:9c:b6:62:f8:
        42:ac:fd:4c:6b:7d:54:ec:36:64:44:cb:9e:11:2a:90:c8:91:
        68:ed:94:d1:b6:3e:b7:26:4f:fa:ec:d6:d7:3a:11:60:5a:5d:
        d3:fe:92:60:0c:90:43:09:88:7e:26:d9:83:f7:eb:02:d7:c4:
        18:76:7f:8f:66:d7:19:52:6a:80:8e:70:78:69:ab:bb:1c:f5:
        04:bc:20:3d:fa:58:9c:d2:9b:1a:b7:fd:c0:44:bb:af:c9:a4:
```

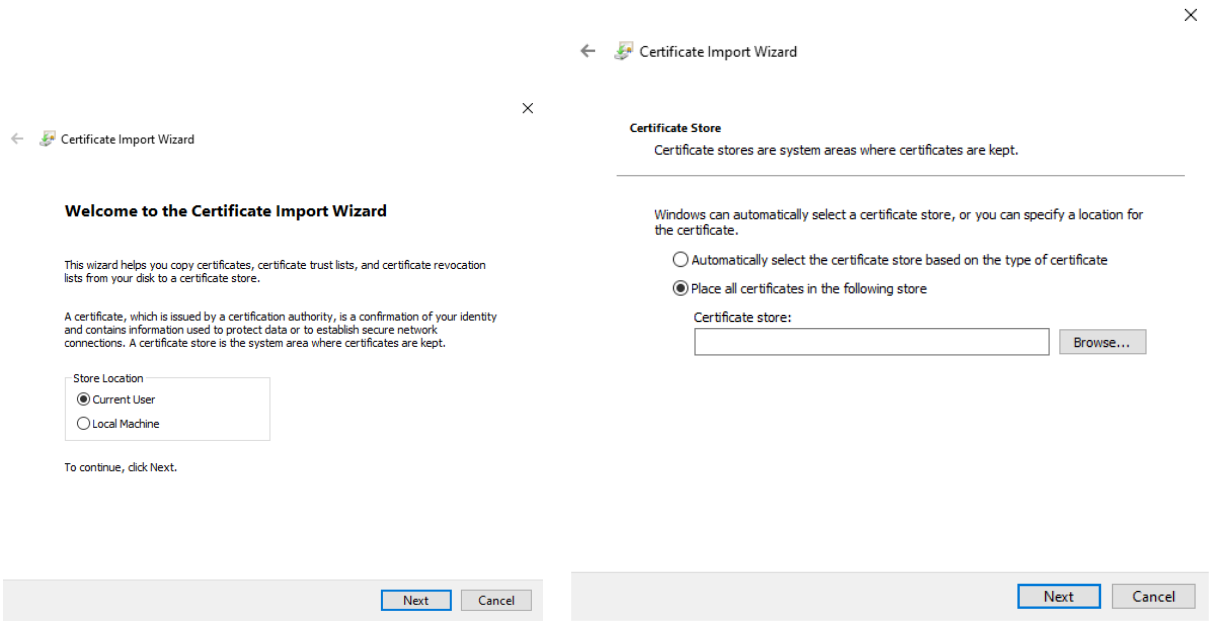
Install the certificate to a local Certificate Authority

12. To install the certificate, open a File Explorer, navigate to the certificate directory, and double click on the certificate.

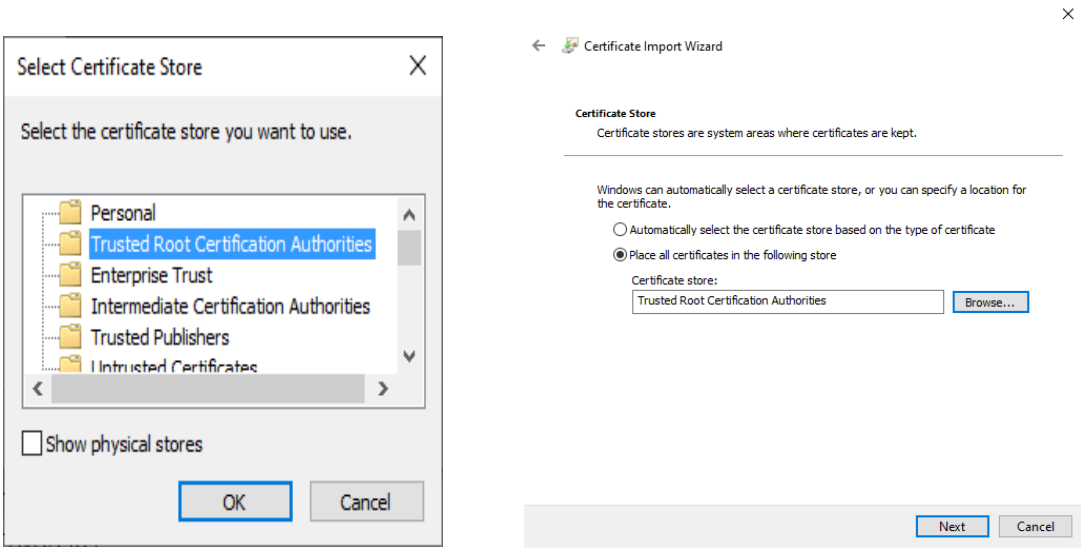




13. Click on **Install Certificate.** In the certification import wizard, select the **current user,** click on **Next.**
    Select **Place all certificates in the following store**



Browse → **select Trusted Root Certification Authorities**



Click on **Finish**.

Configure the react-scripts start to use the generated certificate and key

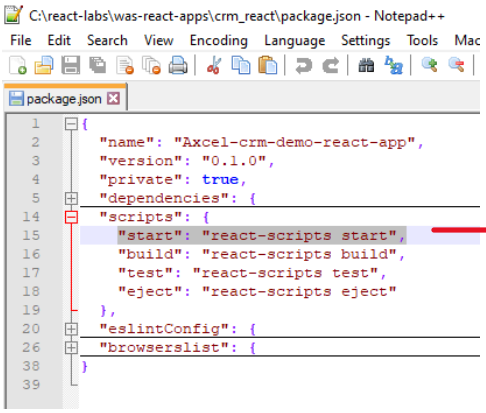
14. In your react project, modify the **package,json** scripts to start using HTTPS

    Replace the existing script command: **"start": "react-scripts start",**

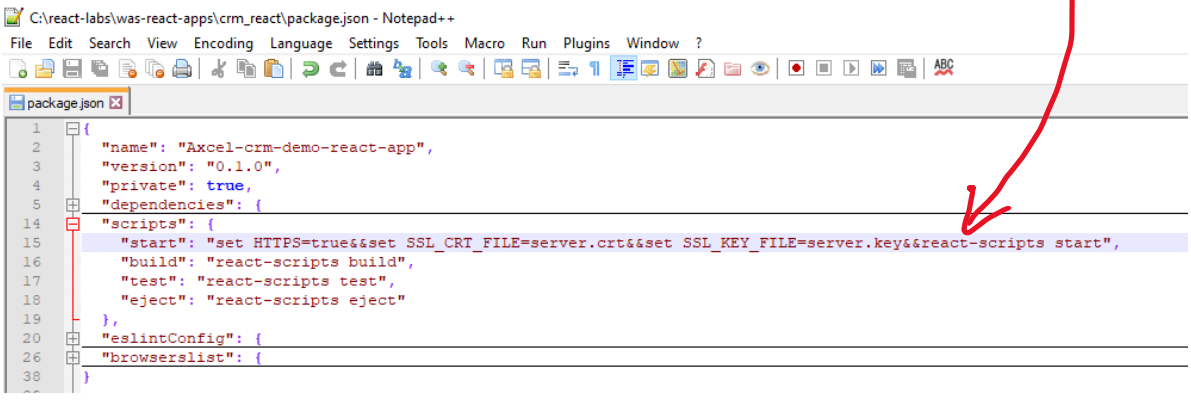
    With the **following script command**:

"start": "set HTTPS=true&&set SSL_CRT_FILE=server.crt&&set SSL_KEY_FILE=server.key&&react-scripts start",

package.json



Modified package.json using HTTPS



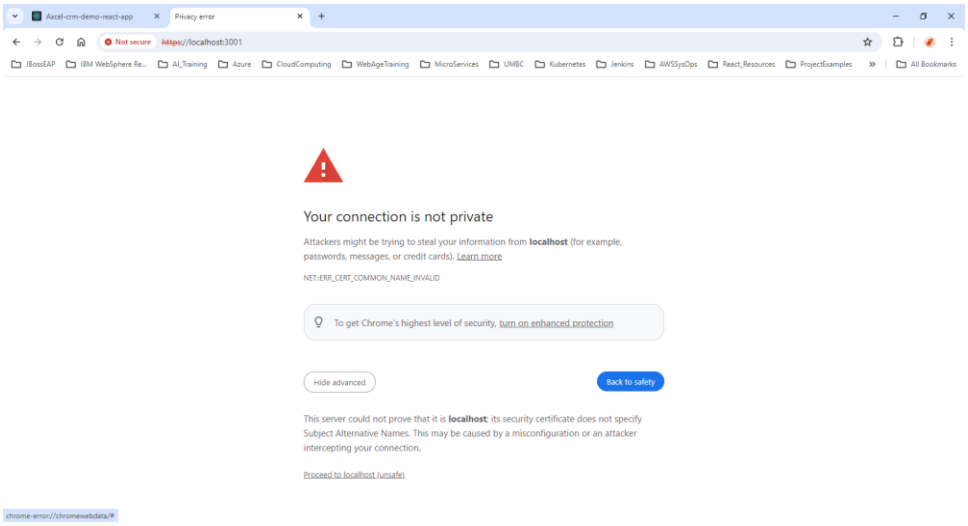
and **save** the file.

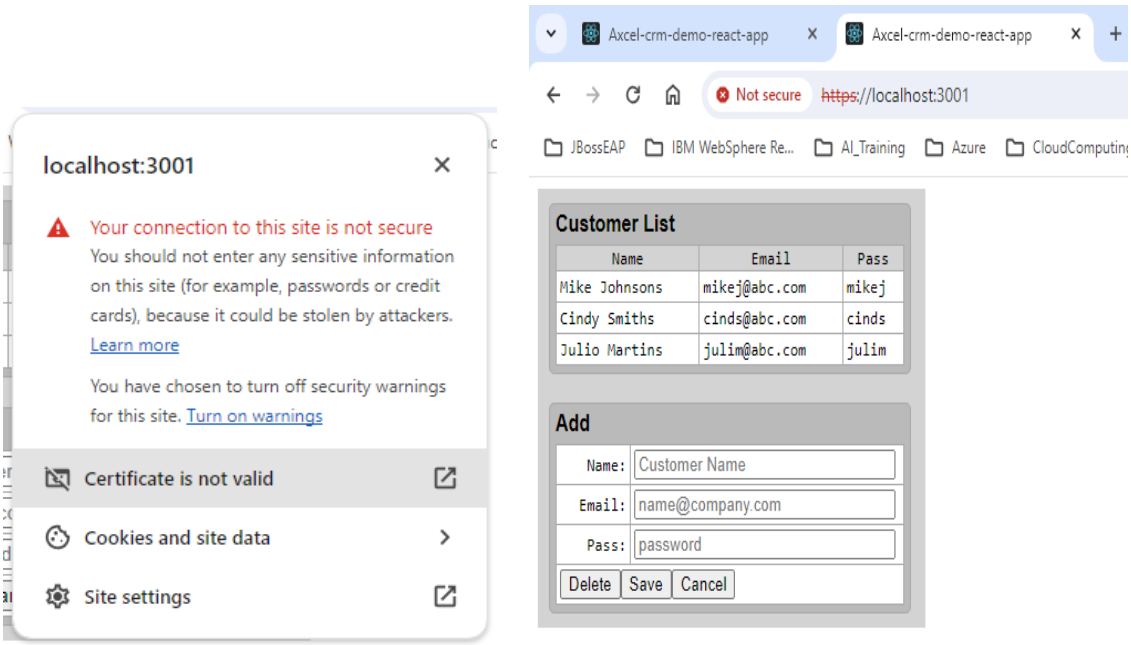
15. Open a command window, cd to C:\react-labs\was-react-apps\crm_react

    Type the npm command to run the application

    npm start

16. Open a browser, go to **https://localhost:3001**





What can you do to make your ssl certificate valid?