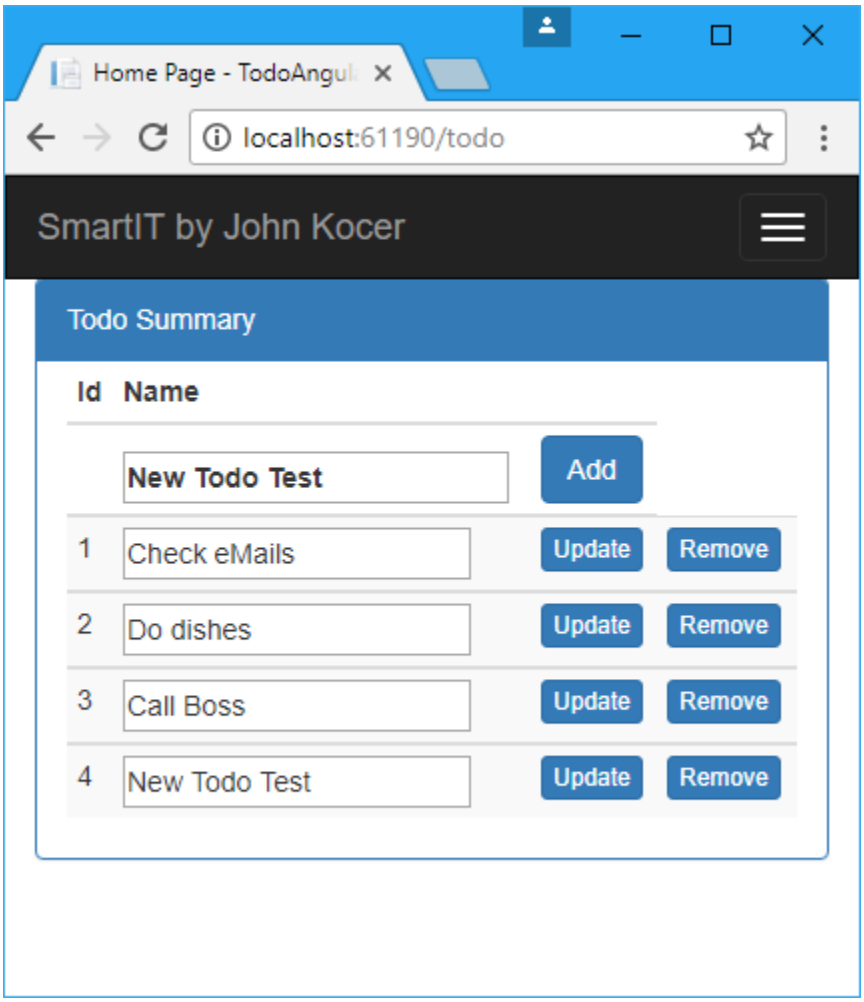
How to Create To-do CRUD operation with ASP.NET MVC Core, Angular 4.0

Visual Studio 2017, ASP.NET Core 2.0

By John kocer- SmartIT



Introduction

In this session, we will learn

-How to consume Todo inmemory database using TodoRepository.
-How to create custom ASP.NET MVC custom controller with CRUD operations.
-List of Objects
-Create a new insert object via View
-Update and object via Edit View
-Delete an Item via Delete View.
-Write HttpPost Create API method.
-Write HttpPut Edit API method.
-Write HttpPost Delete API method.
-SmartIT DebugTraceHelper tool
-Loose Coupling
-Dependency Injection

-Singleton
-Route
-Responsive Web Design

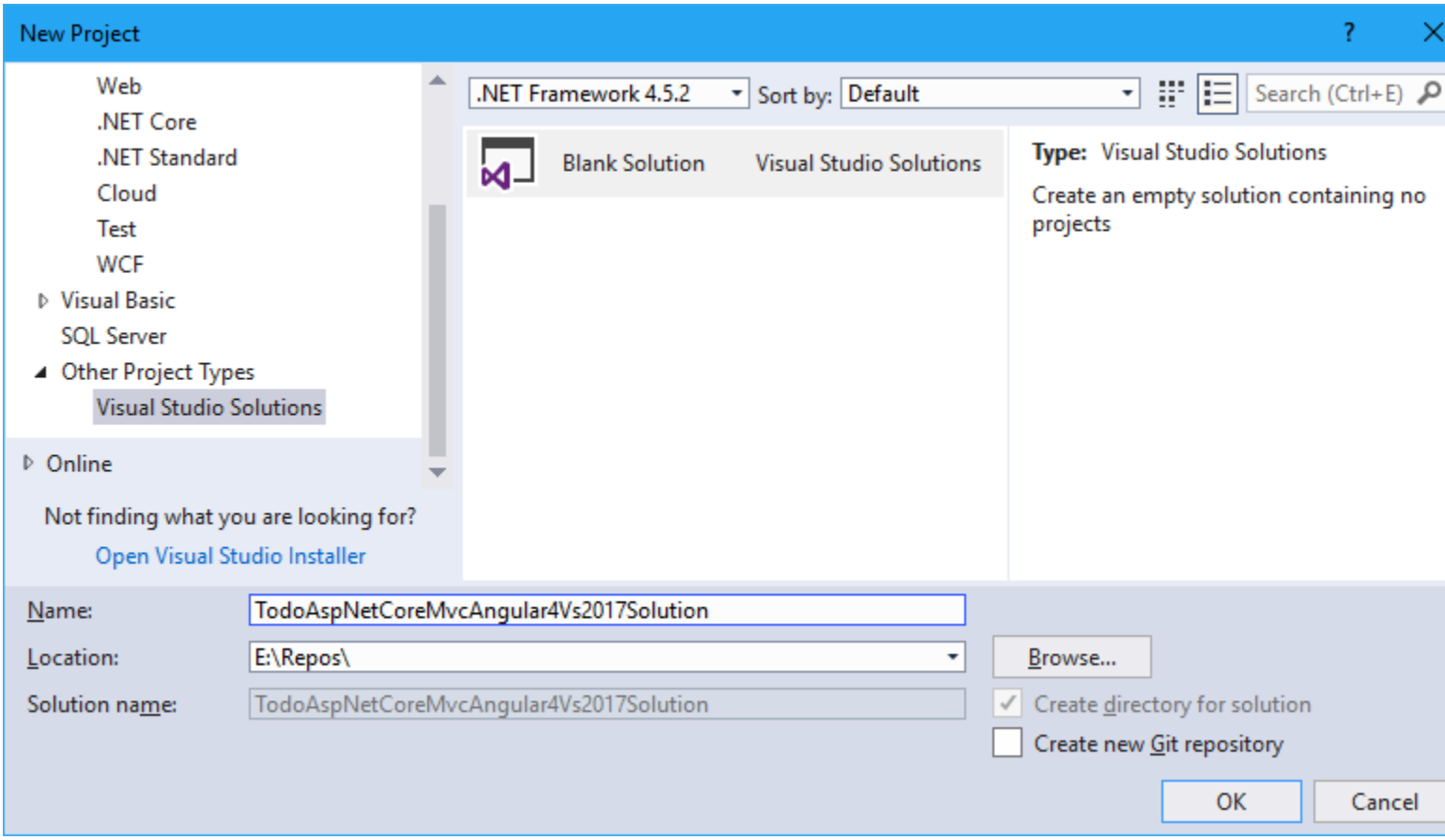
- A lab exercise for you to demonstrate what have you learned from this training material to create your own Employee CRUD operation using EmployeeRepository included in this training material.

Pre-Requirements

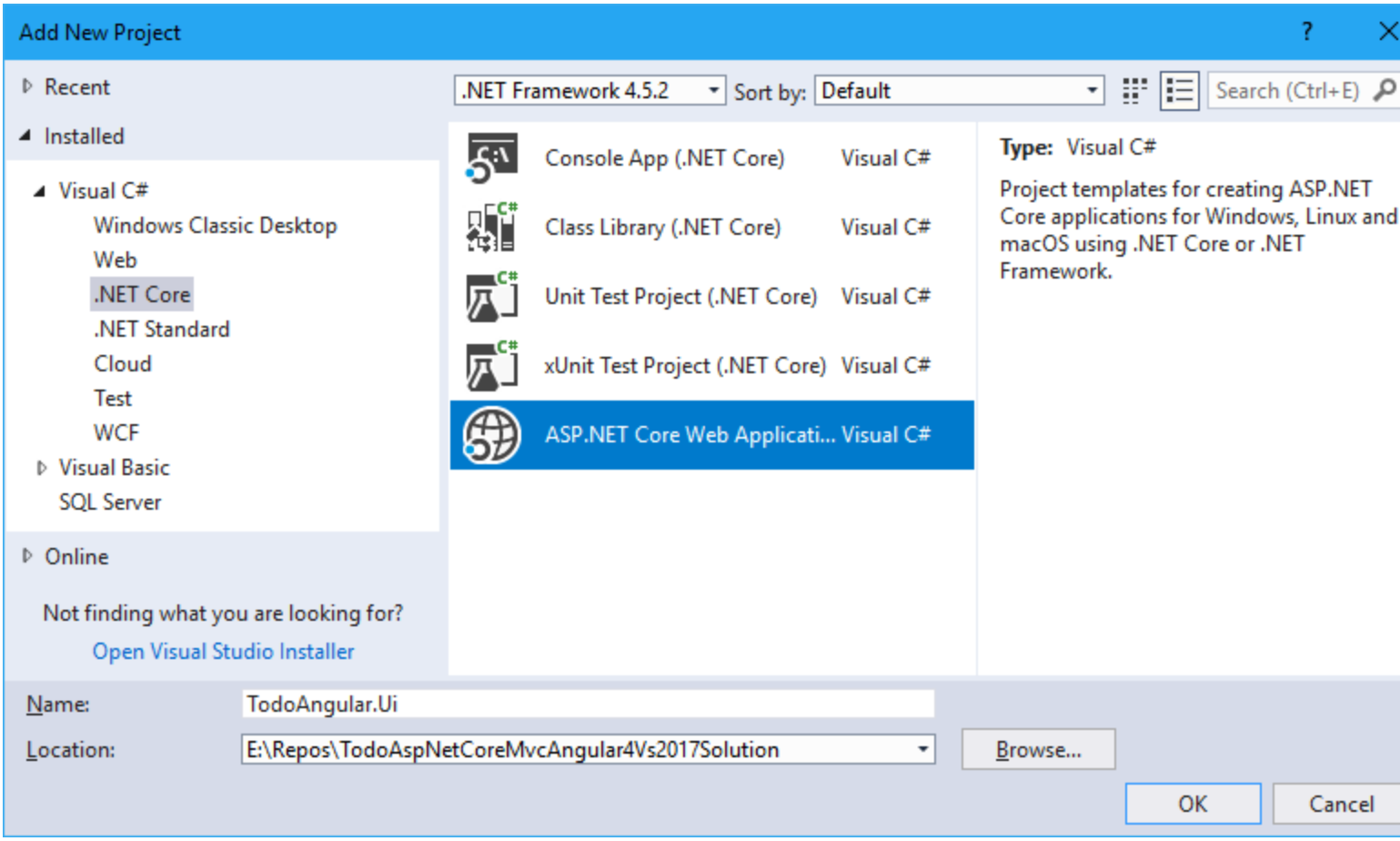
In order to be able to run the example from the download or build it from scratch, you need to have the following tools:

-Visual Studio 2017 latest version
-.NET Core 2.0 or above
-TypeScript 1.8 or above
-Node.js
-Angular 4.0 or above

-Create a new solution and name it **TodoAspNetCoreMvcAngular4Vs2017Solution**

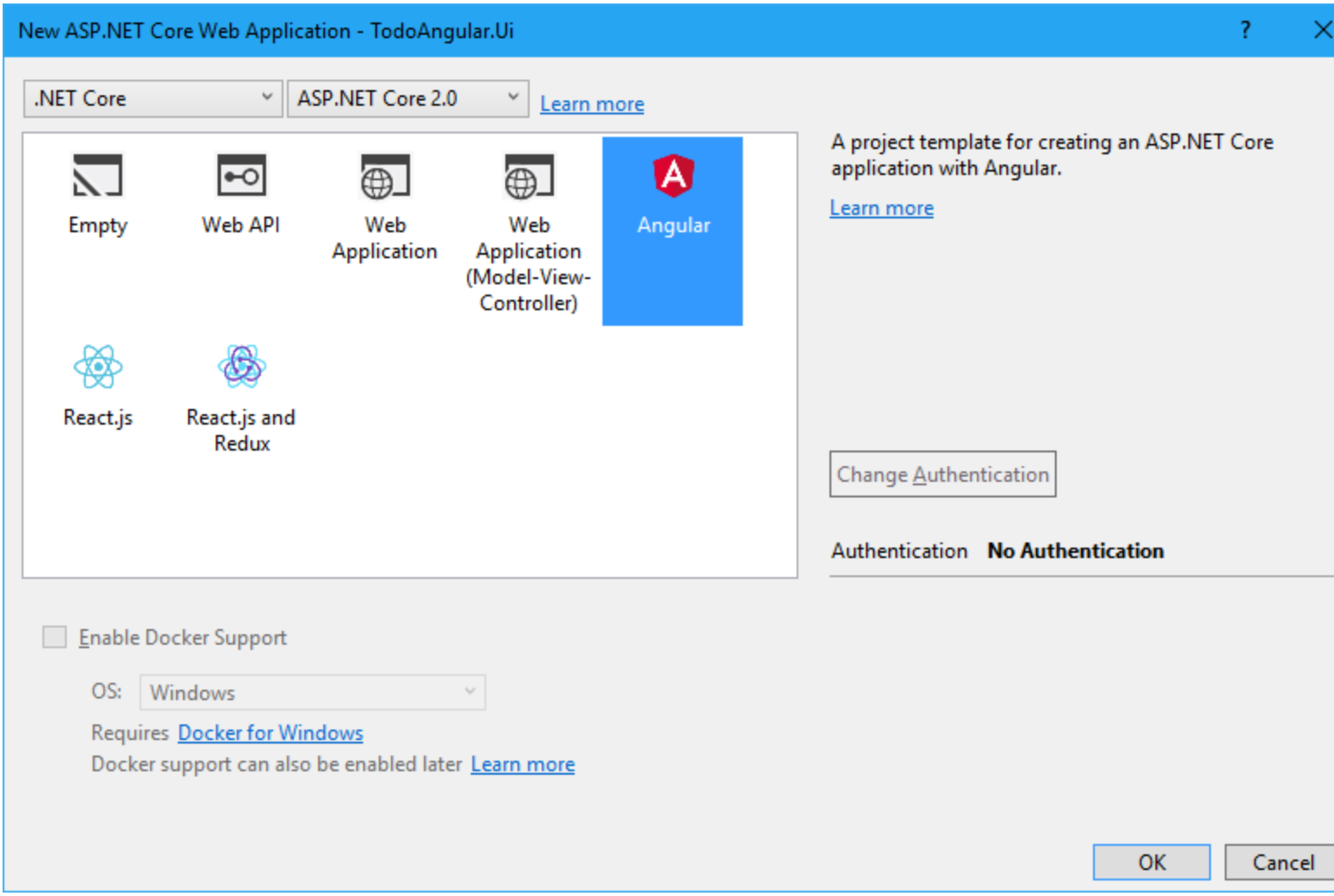


-Add a new ASP.NET Core Web Application project and name it **TodoAngular.Ui**

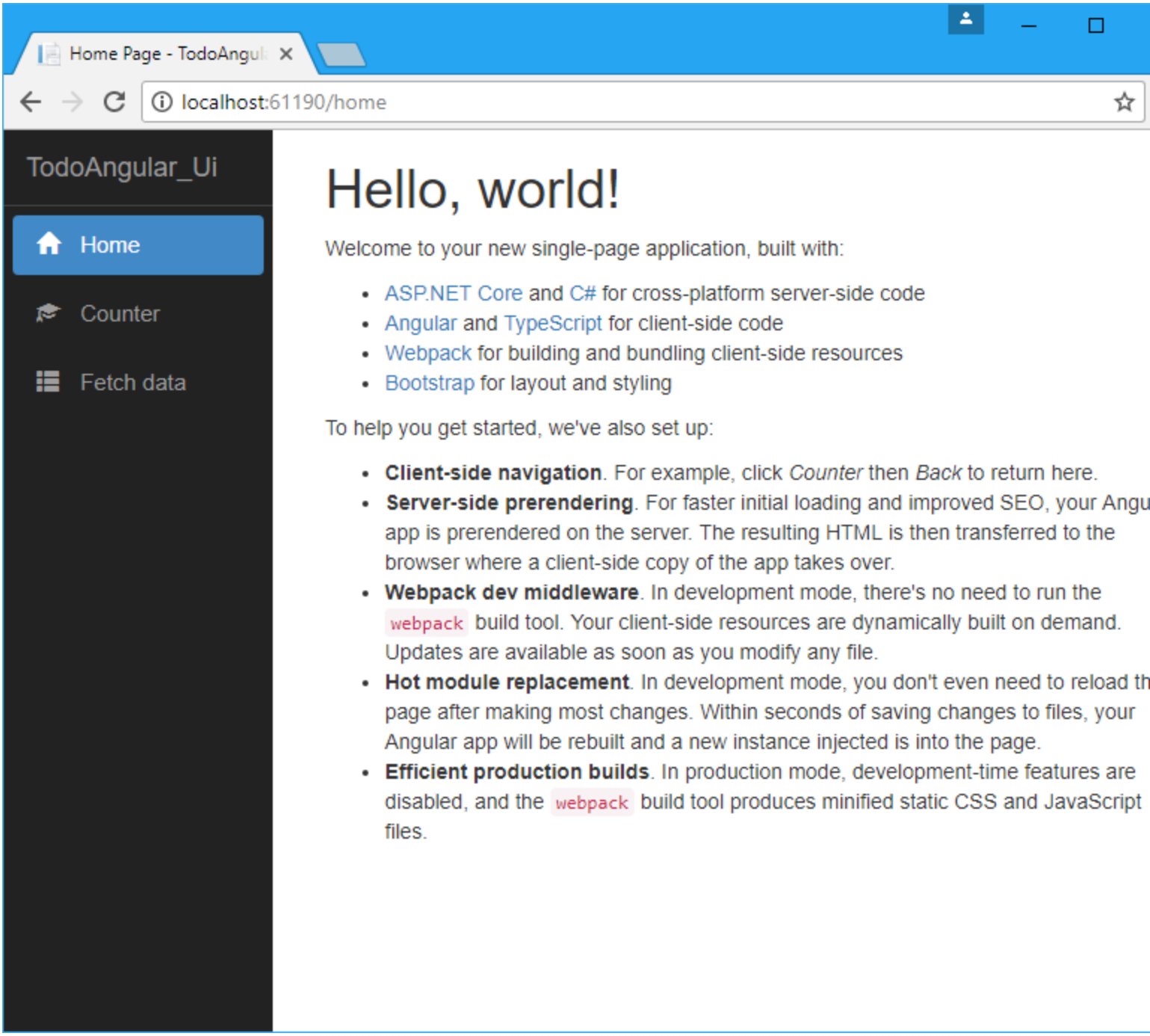


-Visual Studio 2017 ASP.NET Core 2.0 comes with an Angular project template.

-Next screen select Angular Web Application project template.

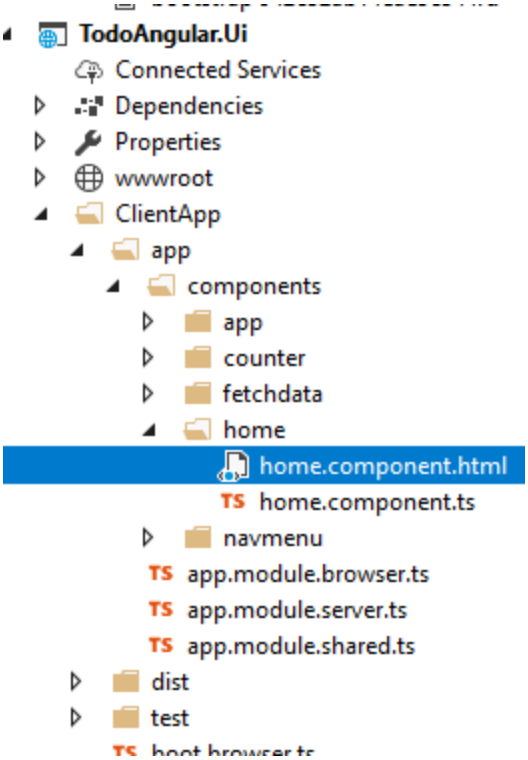


-Compile and run the application and we'll see the home page.



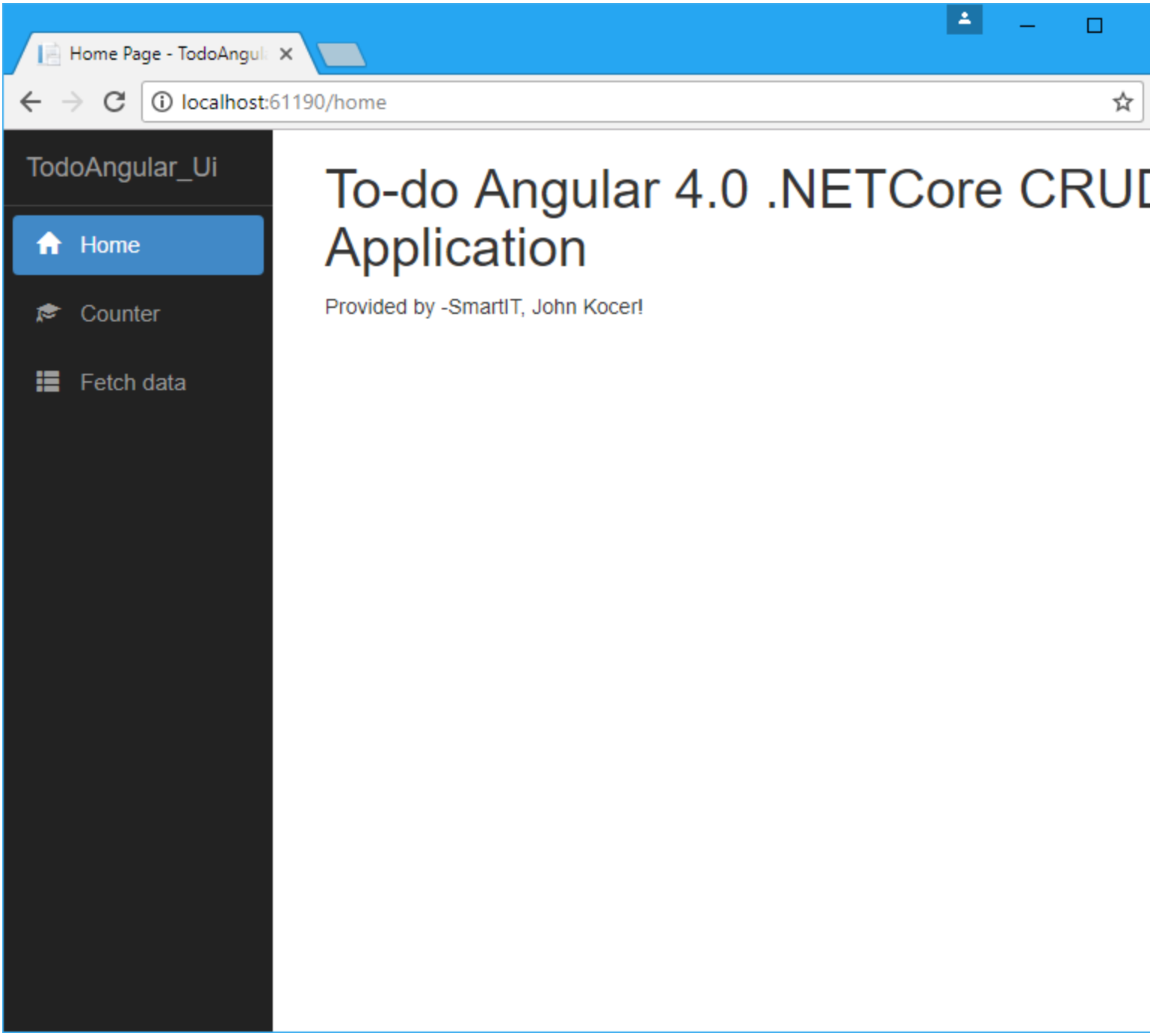
-Lets change to home page content

-Go to the home.component.html in the ClientApp directory.



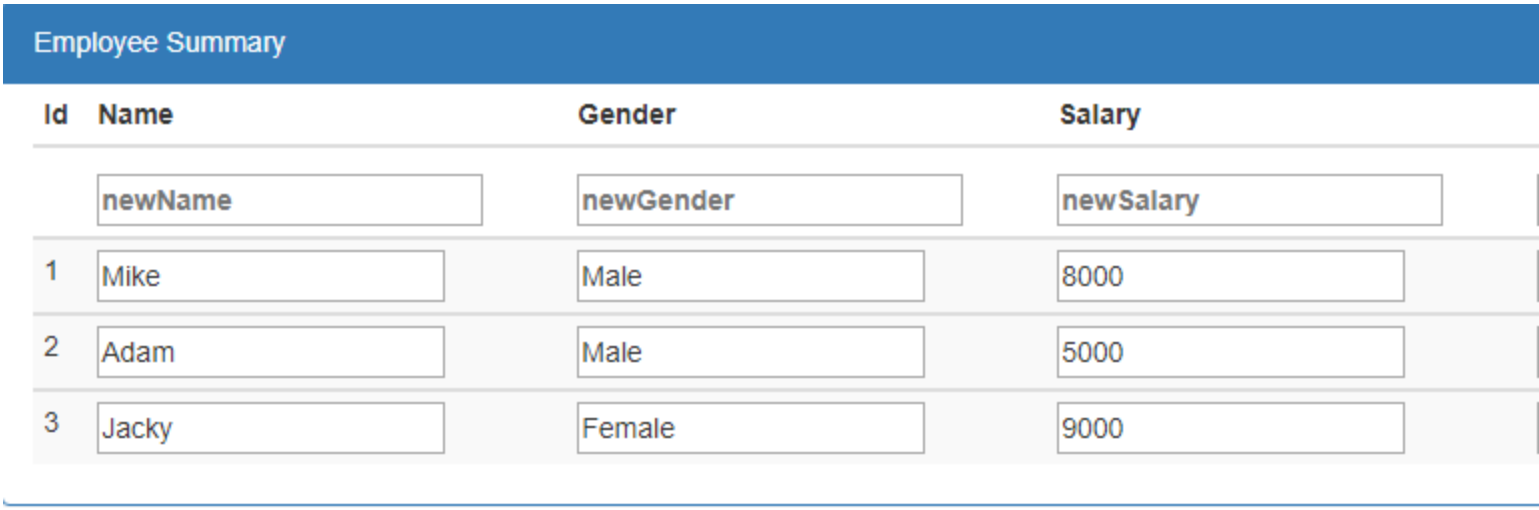
-Replace the home content with below lines when the project is still running. Angular had change detection functionally and reflects your changes on the running application.

-Home content will change on the run time.




```
<h1>To-do Angular 4.0 .NETCore CRUD Application </h1>
<p>Provided by -SmartIT,  John Kocer!</p>
```

We want to create below single page application with CRUD operation, Add, Update and Remove functionality with in-memory TodoRepository Database.



-We need to do below tasks

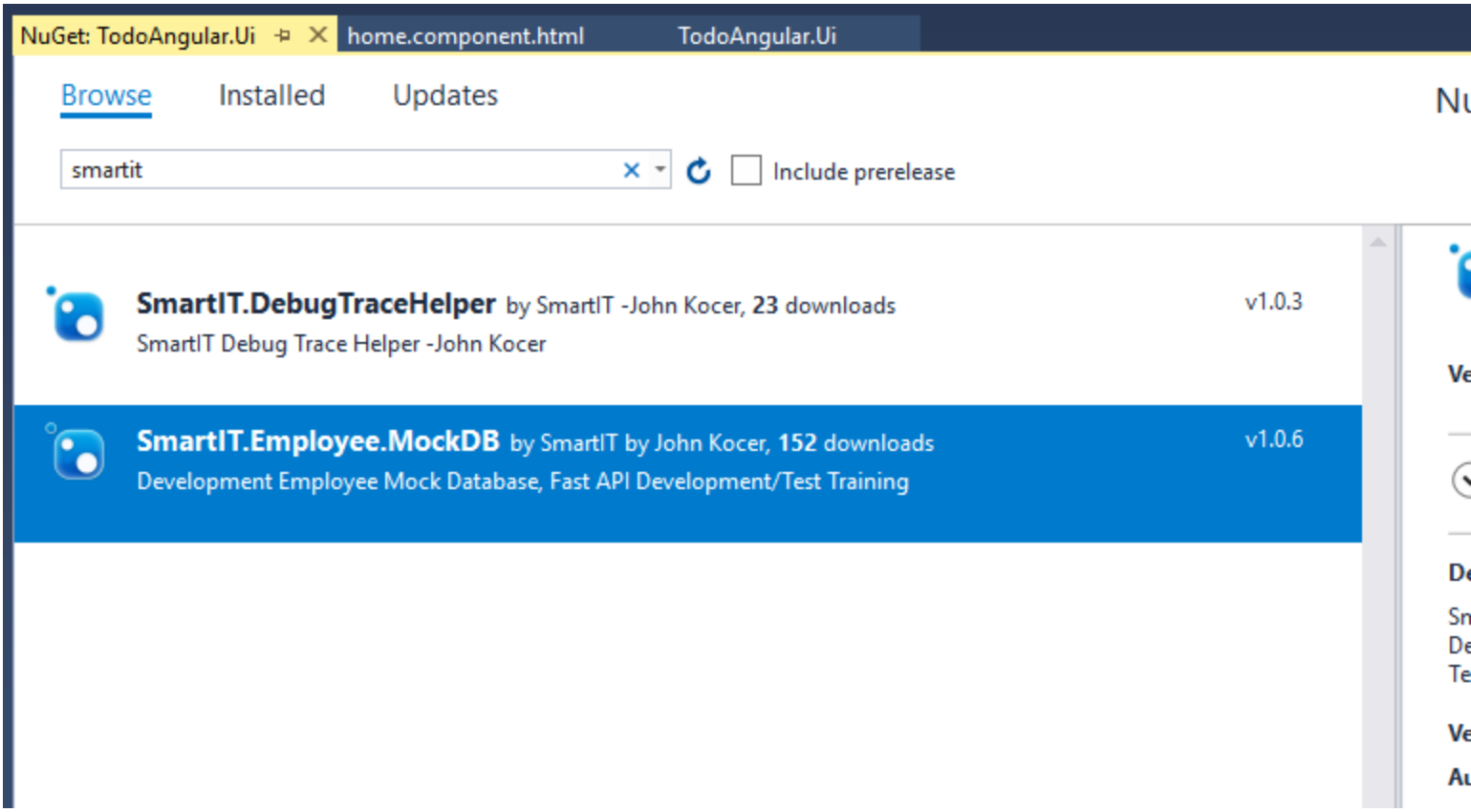
1- Set TodoRepository
2- Create TodoController
3-Add Dependency Injection
4- Create todoService.ts
5-Create todo.component.html
6-Create todo.component.ts
7-Add new created component into ApModule
8-Update Angular routing to go Todo page.

1- Set TodoRepository

-Use SmartIT.Employee.MockDB which has TodoRepository in it with in-memory MOCK database which has dependency injection interfaces implemented . You may go to below web site and read the usage examples.

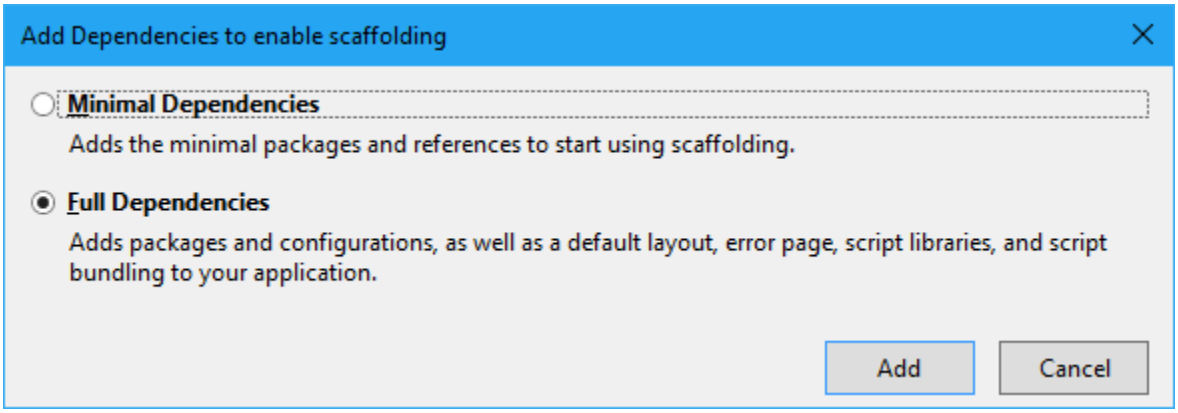
https://www.nuget.org/packages/SmartIT.Employee.MockDB/

-Use Nuget Package manager to Install SmartIT.Employee.MockDB from nugget.org.

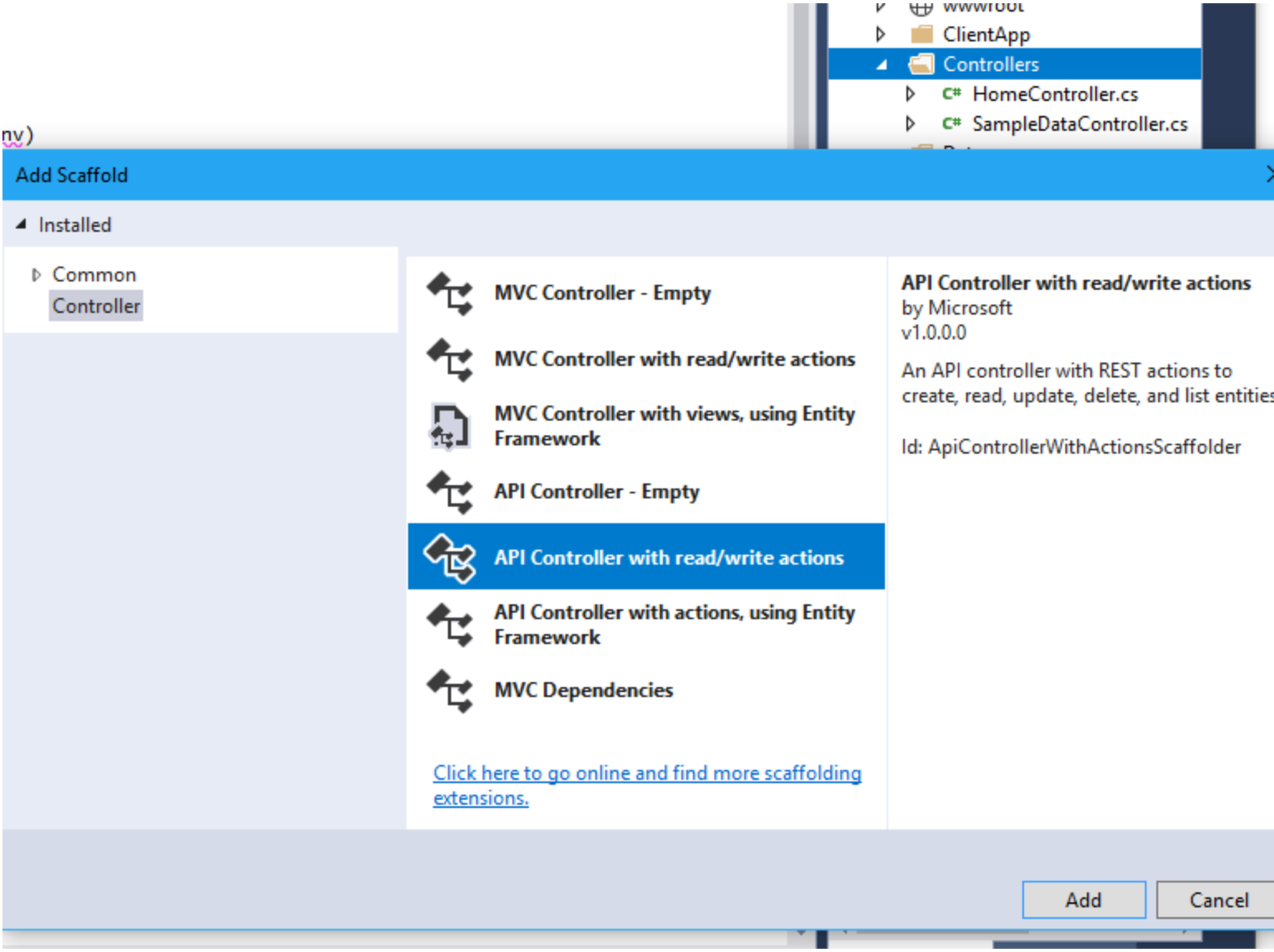


2- Create TodoController

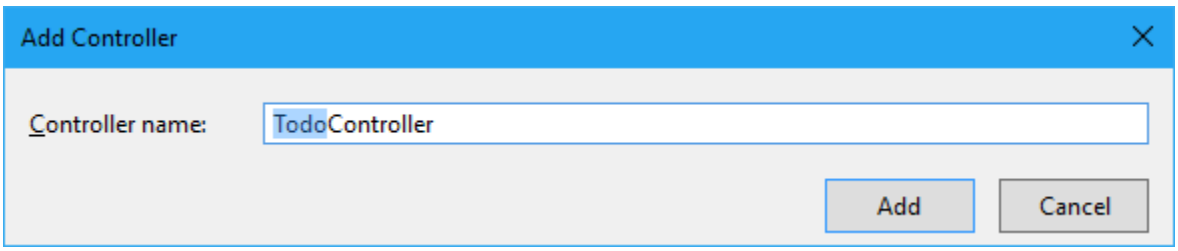
-On the controller directory add a new controller select Full Dependencies and Add.



- Select API Controlerr with read/write actions from the list and click Add



-Name it TodoController and Click Add.



-TodoController will be created.

```
namespace TodoAngular.Ui.Controllers
{
    [Produces("application/json")]
    [Route("api/Todo")]
    public class TodoController : Controller
    {
        // GET: api/Todo
        [HttpGet]
        public IEnumerable<string> Get()
        {
            return new string[] { "value1", "value2" };
        }

        // GET: api/Todo/5
        [HttpGet("{id}", Name = "Get")]
        public string Get(int id)
        {
            return "value";
        }

        // POST: api/Todo
        [HttpPost]
        public void Post([FromBody]string value)
        {
        }

        // PUT: api/Todo/5
        [HttpPut("{id}")]
        public void Put(int id, [FromBody]string value)
        {
        }

        // DELETE: api/ApiWithActions/5
        [HttpDelete("{id}")]
        public void Delete(int id)
        {
        }
    }
}
```

3-Add Dependency Injection

-Go to the Startup page ConfigureServices method

```
    public class Startup
    {
        public Startup(IConfiguration configuration)
        {
            Configuration = configuration;
        }

        public IConfiguration Configuration { get; }

        // This method gets called by the runtime. Use this method to add services to the container.
        public void ConfigureServices(IServiceCollection services)
        {
            services.AddMvc();
        }
```

-Add the `SmartIT.Employee.MockDB` using statement top of the Startup page.

```
using SmartIT.Employee.MockDB;
```

-Add the AddSigleton service. Why we chose as Sigleton? Because our service is an In-memory repository data services. We want only a single instance will be created.

```
services.AddSingleton<ITodoRepository, TodoRepository>(); //Add the services here
```

```
using SmartIT.Employee.MockDB;

namespace TodoAngular_Ui
{
  public class Startup
  {
    public Startup(IConfiguration configuration)
    {
      Configuration = configuration;
    }

    public IConfiguration Configuration { get; }

    // This method gets called by the runtime. Use this method to add services to the container.
    public void ConfigureServices(IServiceCollection services)
    {
      services.AddMvc();
      services.AddSingleton<ITodoRepository, TodoRepository>(); //Add the services here
    }
```

-Add **top of the TodoController page**
using SmartIT.Employee.MockDB;
-Add private readonly ITodoRepository _todoRepository; readonly ItodoRepositor Interface member.

```
using SmartIT.Employee.MockDB;

namespace TodoAngular.Ui.Controllers
{
  [Produces("application/json")]
  [Route("api/Todo")]
  public class TodoController : Controller
  {
    private readonly ITodoRepository _todoRepository;
    public TodoController(ITodoRepository todoRepository)
    {
      _todoRepository = todoRepository;
    }
```

-Add a Todo Contructor
-Add GetAllTodos Httpget mehot with [Route("~/api/GetAllTodos")]

-Here is the final changes in below on the TodoController

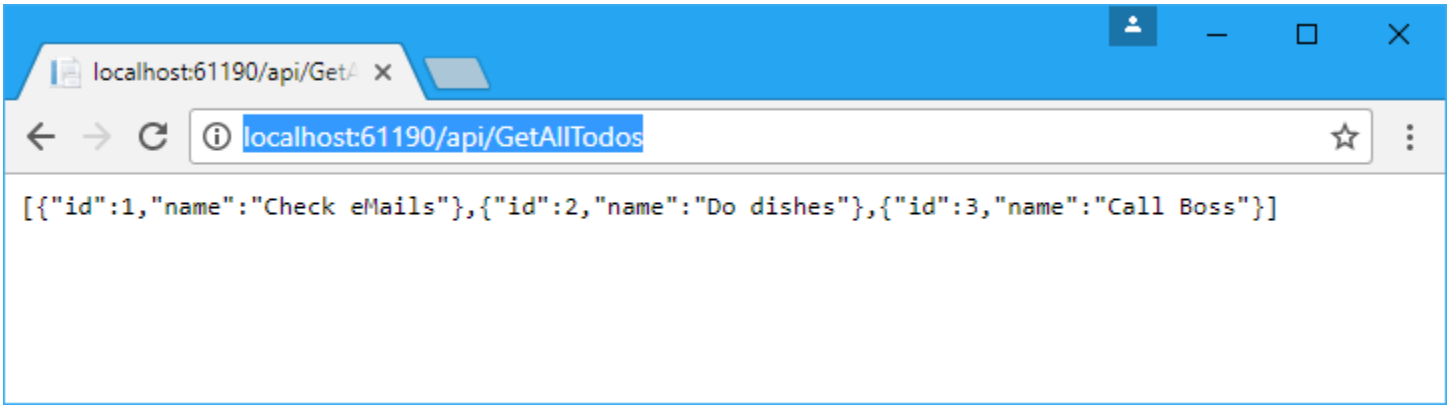
```
using SmartIT.Employee.MockDB;

namespace TodoAngular.Ui.Controllers
{
  [Produces("application/json")]
  [Route("api/Todo")]
  public class TodoController : Controller
  {
    private readonly ITodoRepository _todoRepository;
    public TodoController(ITodoRepository todoRepository)
    {
      _todoRepository = todoRepository;
    }
    // GET: api/Todo
    [Route("~/api/GetAllTodos")]
    [HttpGet]
    public IEnumerable<Todo> GetAllTodos()
    {
      return _todoRepository.GetAll();
    }
```

-Compile and run the application.

-Test get all todos with calling to Api

http://localhost:61190/api/GetAllTodos

Note: Your port number may be different than ours, use your local port number.

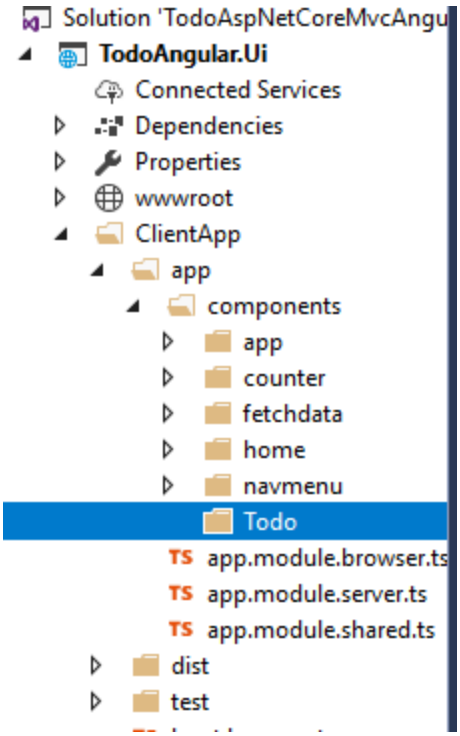


-Update the remainder of the TodoController like below.

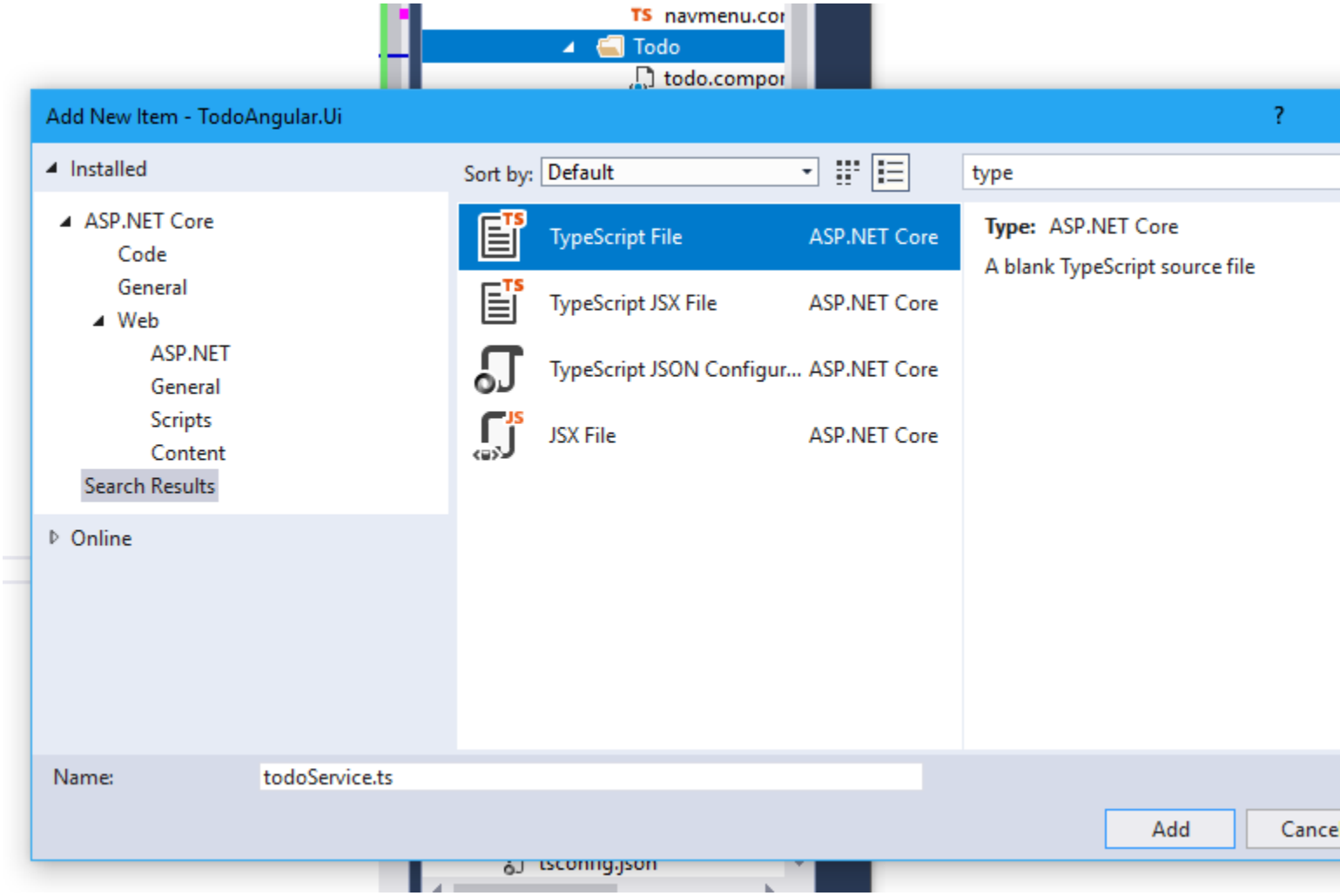
```
using System.Collections.Generic;
using Microsoft.AspNetCore.Mvc;
using SmartIT.Employee.MockDB;

namespace TodoAngular.Ui.Controllers
{
  [Produces("application/json")]
  [Route("api/Todo")]
  public class TodoController : Controller
  {
    private readonly ITodoRepository _todoRepository;
    public TodoController(ITodoRepository todoRepository)
    {
      _todoRepository = todoRepository;
    }

    [Route("~/api/GetAllTodos")]
    [HttpGet]
    public IEnumerable<Todo> GetAllTodos()
    {
      return _todoRepository.GetAll();
    }

    [Route("~/api/AddTodo")]
    [HttpPost]
    public Todo AddTodo([FromBody]Todo item)
    {
      return _todoRepository.Add(item);
    }

    [Route("~/api/UpdateTodo")]
    [HttpPut]
    public Todo UpdateTodo([FromBody]Todo item)
    {
      return  _todoRepository.Update(item);
    }

    [Route("~/api/DeleteTodo/{id}")]
    [HttpDelete]
    public void Delete(int id)
    {
      var findTodo = _todoRepository.FindById(id);
      if (findTodo != null)
        _todoRepository.Delete(findTodo);
    }
  }
}
```

4- Create todoService.ts

-Add a Todo folder under components directory.

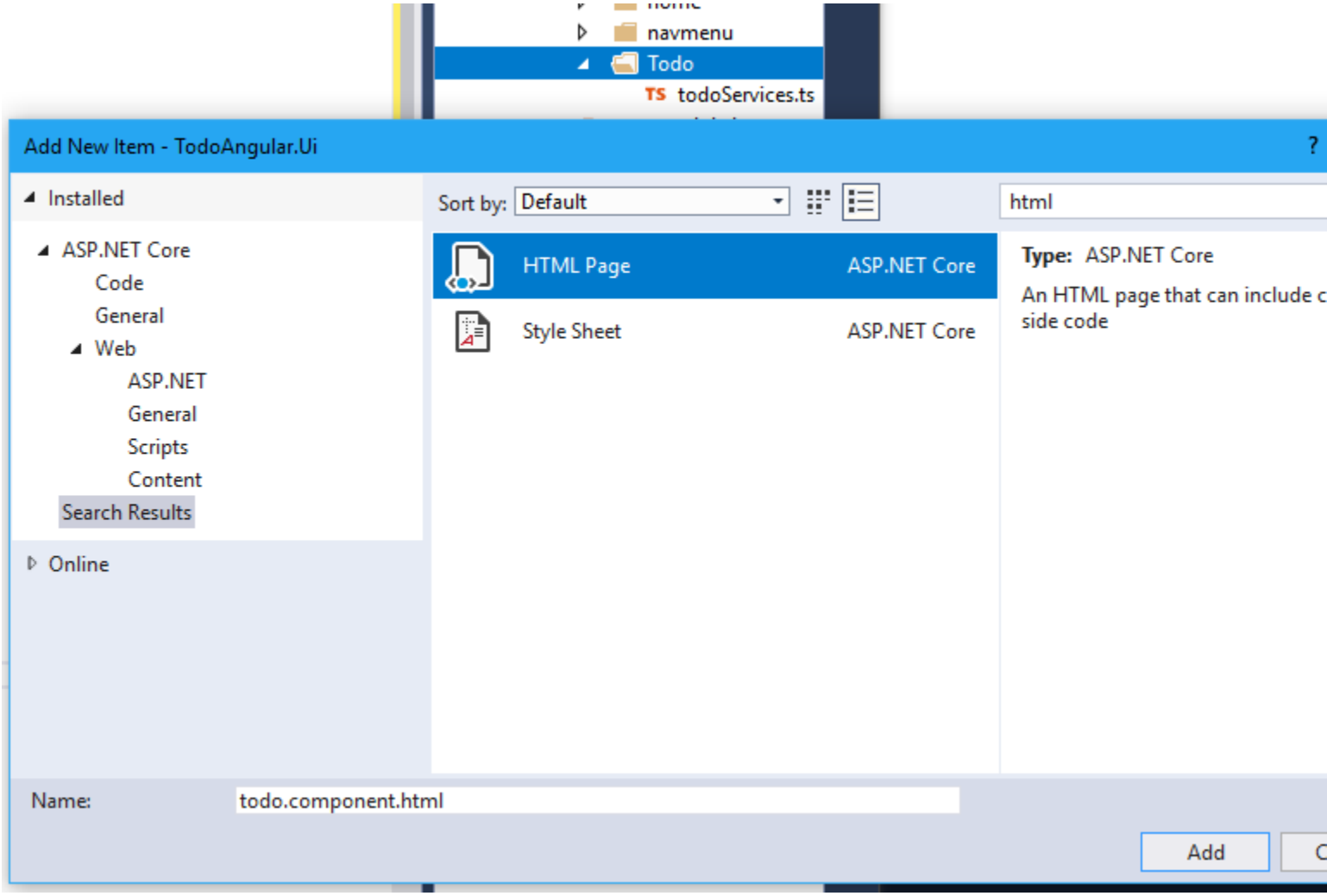


-Add a TypeScript file **todoService.ts** into Todo directory.



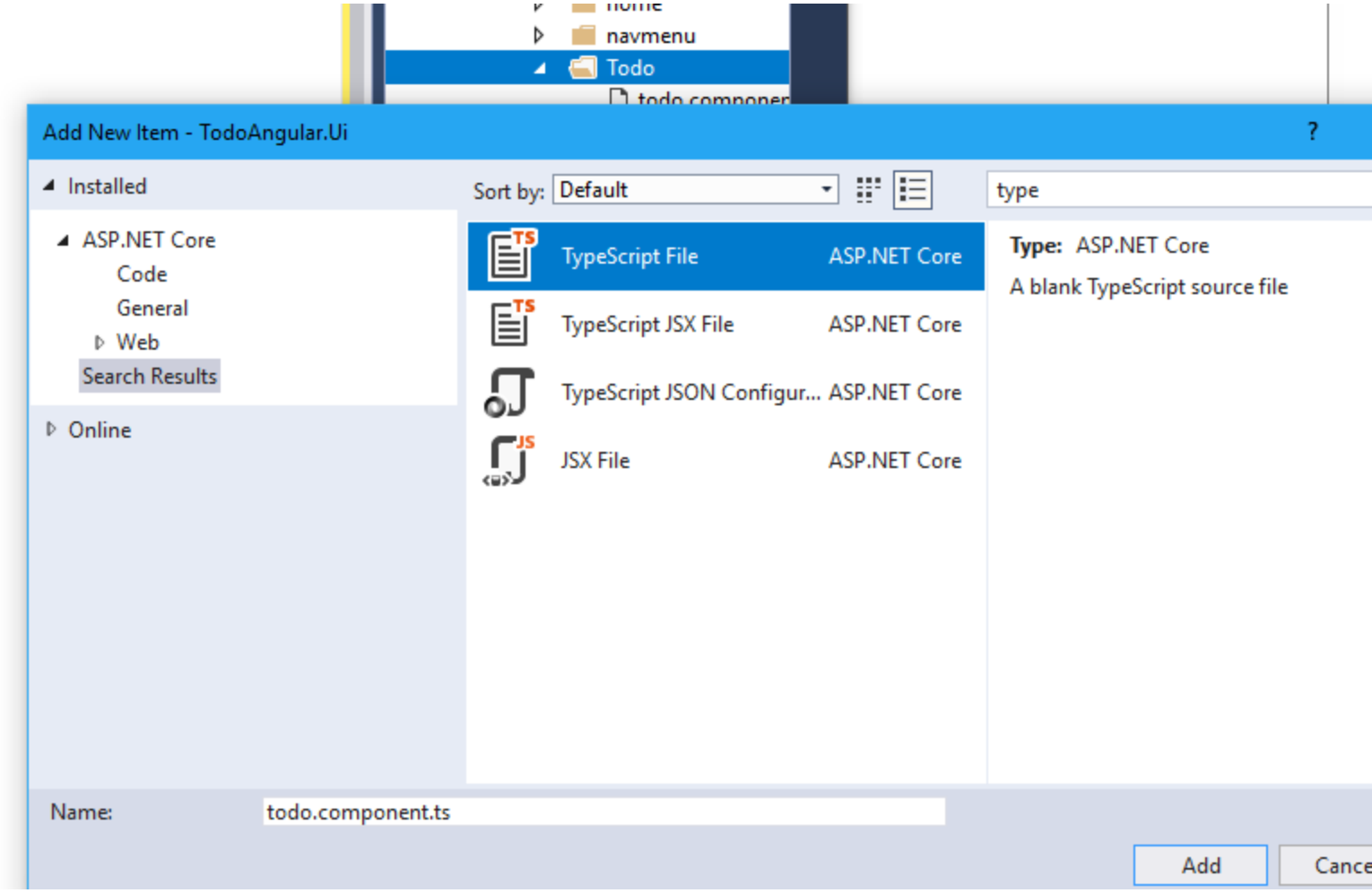
5-Create todo.component.html

-Add an HTML page into Todo directory and name it **todo.component.html**



6-Create todo.component.ts

-Add TypeScript file called **to.component.ts** into Todo directory.



7-Add new created component into ApModule

```
import { CounterComponent } from './components/counter/counter.component';
import { TodoComponent } from './components/todo/todo.component';

@NgModule({
  declarations: [
    AppComponent,
    NavMenuComponent,
    CounterComponent,
    FetchDataComponent,
    HomeComponent,
    TodoComponent
  ],
  imports: [
    CommonModule,
    HttpModule,
    FormsModule,
    RouterModule.forRoot([
      { path: '', redirectTo: 'home', pathMatch: 'full' },
      { path: 'todo', component: TodoComponent },
      { path: 'home', component: HomeComponent },
      { path: 'counter', component: CounterComponent },
      { path: 'fetch-data', component: FetchDataComponent },
      { path: '**', redirectTo: 'home' }
    ])
  ]
})
export class AppModuleShared {
```

-Lets update the menu

-Change this line From `<a class='navbar-brand' [routerLink]="['/home']">TodoAngular_Ui</a>`

To `<a class='navbar-brand' [routerLink]="['/home']">SmartIT by John Kocer</a>`

-Add new menu Item Todo

```
<li [routerLinkActive]="['link-active']">
                    <a [routerLink]="['/todo']">
                        <span class='glyphicon glyphicon-user'></span> Todo
                    </a>
  </li>
```

-Here is updated menu

```
<div class='main-nav'>
  <div class='navbar navbar-inverse'>
    <div class='navbar-header'>
      <button type='button' class='navbar-toggle' data-toggle='collapse' data-target='.navbar-
collapse'>
        <span class='sr-only'>Toggle navigation</span>
        <span class='icon-bar'></span>
        <span class='icon-bar'></span>
        <span class='icon-bar'></span>
      </button>
      <a class='navbar-brand' [routerLink]="['/home']">SmartIT by John Kocer</a>
    </div>
    <div class='clearfix'></div>
    <div class='navbar-collapse collapse'>
      <ul class='nav navbar-nav'>
        <li [routerLinkActive]="['link-active']">
          <a [routerLink]="['/todo']">
            <span class='glyphicon glyphicon-user'></span> Todo
          </a>
        </li>

        <li [routerLinkActive]="['link-active']">
          <a [routerLink]="['/home']">
            <span class='glyphicon glyphicon-home'></span> Home
          </a>
        </li>
        <li [routerLinkActive]="['link-active']">
          <a [routerLink]="['/counter']">
            <span class='glyphicon glyphicon-education'></span> Counter
          </a>
        </li>
        <li [routerLinkActive]="['link-active']">
          <a [routerLink]="['/fetch-data']">
            <span class='glyphicon glyphicon-th-list'></span> Fetch data
          </a>
        </li>
      </ul>
    </div>
  </div>
</div>
```

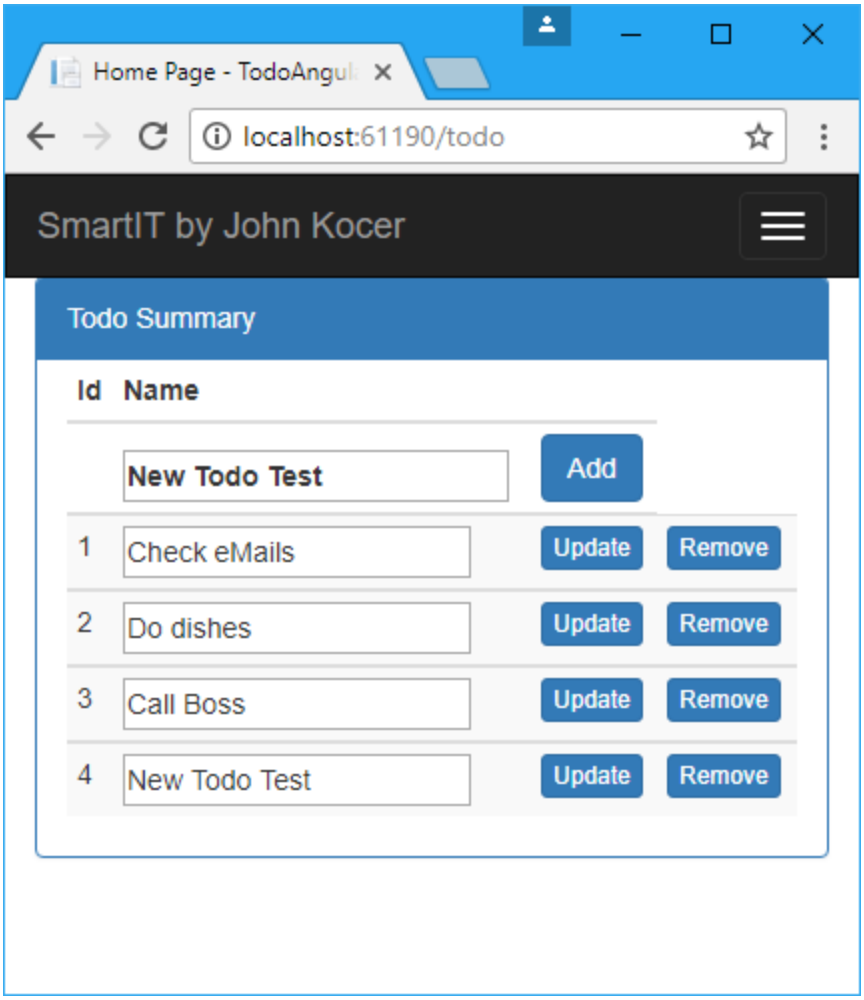
-Update the RouteModule

```
RouterModule.forRoot([
      { path: '', redirectTo: 'home', pathMatch: 'full' },
      { path: 'todo', component: TodoComponent },
      { path: 'home', component: HomeComponent },
      { path: 'counter', component: CounterComponent },
      { path: 'fetch-data', component: FetchDataComponent },
      { path: '**', redirectTo: 'home' }
    ])
```

-Here is the updated RouteModule

```
import { NgModule } from '@angular/core';
import { CommonModule } from '@angular/common';
import { FormsModule } from '@angular/forms';
import { HttpModule } from '@angular/http';
import { RouterModule } from '@angular/router';

import { AppComponent } from './components/app/app.component';
import { NavMenuComponent } from './components/navmenu/navmenu.component';
import { HomeComponent } from './components/home/home.component';
import { FetchDataComponent } from './components/fetchdata/fetchdata.component';
import { CounterComponent } from './components/counter/counter.component';
import { TodoComponent } from './components/todo/todo.component';

@NgModule({
  declarations: [
    AppComponent,
    NavMenuComponent,
    CounterComponent,
    FetchDataComponent,
    HomeComponent,
    TodoComponent
  ],
  imports: [
    CommonModule,
    HttpModule,
    FormsModule,
    RouterModule.forRoot([
      { path: '', redirectTo: 'todo', pathMatch: 'full' },
      { path: 'todo', component: TodoComponent },
      { path: 'home', component: HomeComponent },
      { path: 'counter', component: CounterComponent },
      { path: 'fetch-data', component: FetchDataComponent },
      { path: '**', redirectTo: 'todo' }
    ])
  ]
})
export class AppModuleShared {
}
```

-Here is the final result of responsive web design result.



Summary

In this article, we will learned

--How to consume Todo inmemory database using TodoRepository.
-How to create custom ASP.NET MVC custom controller with CRUD operations.
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-Create a new insert object via View
-Update and object via Edit View
-Delete an Item via Delete View.
-Write HttpPost Create API method.
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-Dependency Injection
-Singleton
-Route
-Responsive Web Design

Lab Exercise

A lab exercise for you to demonstrate what have you learned from this training material to create your own Employee Angular CRUD Responsive Design SPA application. The EmployeeRepository included in this training material.

-You can follow above steps to create your own Employee CRUD ASP.NET MVC Angular 4.0 application.

```
     //Use below Employee repository to created your CRUD operation
      EmployeeRepository _employeeRepository= new EmployeeRepository();
      _employeeRepository.Add(new Employee() { Name = "Mat Stone", Gender = "Male", DepartmentId = 2,
Salary = 8000 });
      _employeeRepository.CDump("Employees");
    //  DebugHelper.cs(29): Employees
    //{
"Items":[{"Id":1,"Name":"Mike","Gender":"Male","Salary":8000,"DepartmentId":1,"Department":null},
    //{"Id":2,"Name":"Adam","Gender":"Male","Salary":5000,"DepartmentId":1,"Department":null},
    //{"Id":3,"Name":"Jacky","Gender":"Female","Salary":9000,"DepartmentId":1,"Department":null},
    //{"Id":4,"Name":"Mat
Stone","Gender":"Male","Salary":8000,"DepartmentId":2,"Department":null}],"Count":4}
```

For ASP.NET MVC Core Angular 4 CRUD Application

Download color pdf version of this article with pictures.

https://github.com/SmartITAz/TodoAspNetCoreMvcAngular4Vs2017Solution/blob/master/TodoAspMvcDependencyInjection.pdf

NOTE: If you need to copy and paste the code download the pdf file locally.

Download source code from GitHub: https://github.com/SmartITAz/TodoAspNetCoreMvcAngular4Vs2017Solution