Web Services with Web Api – Part 2/2

Web Api

Web API has been around for some years now. It is a very efficient and lightweight technology to build RESTful web services in .NET. Web API is very similar to .NET MVC with its controllers and routing rules. Therefore, if you are familiar with MVC then it's not too difficult to get going with Web API either.

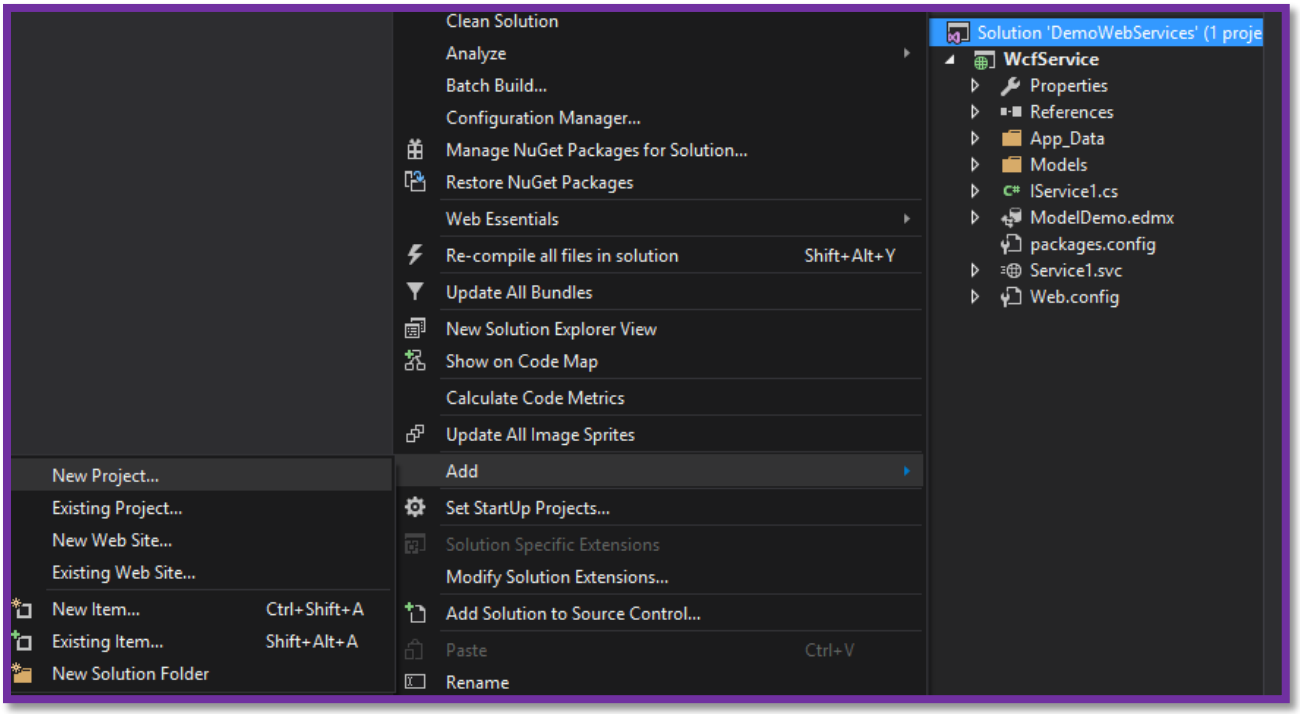
Web API is the great framework for exposing your data and service to different-different devices. Moreover, Web API is open source an ideal platform for building REST-ful services over the .NET Framework. Unlike WCF Rest service, it uses the full features of HTTP (like URIs, request/response headers, caching, versioning, various content formats) and you don't need to define any extra config settings for different devices unlike WCF Rest service. **(dotnet-tricks, 2013)**

Web Api Features

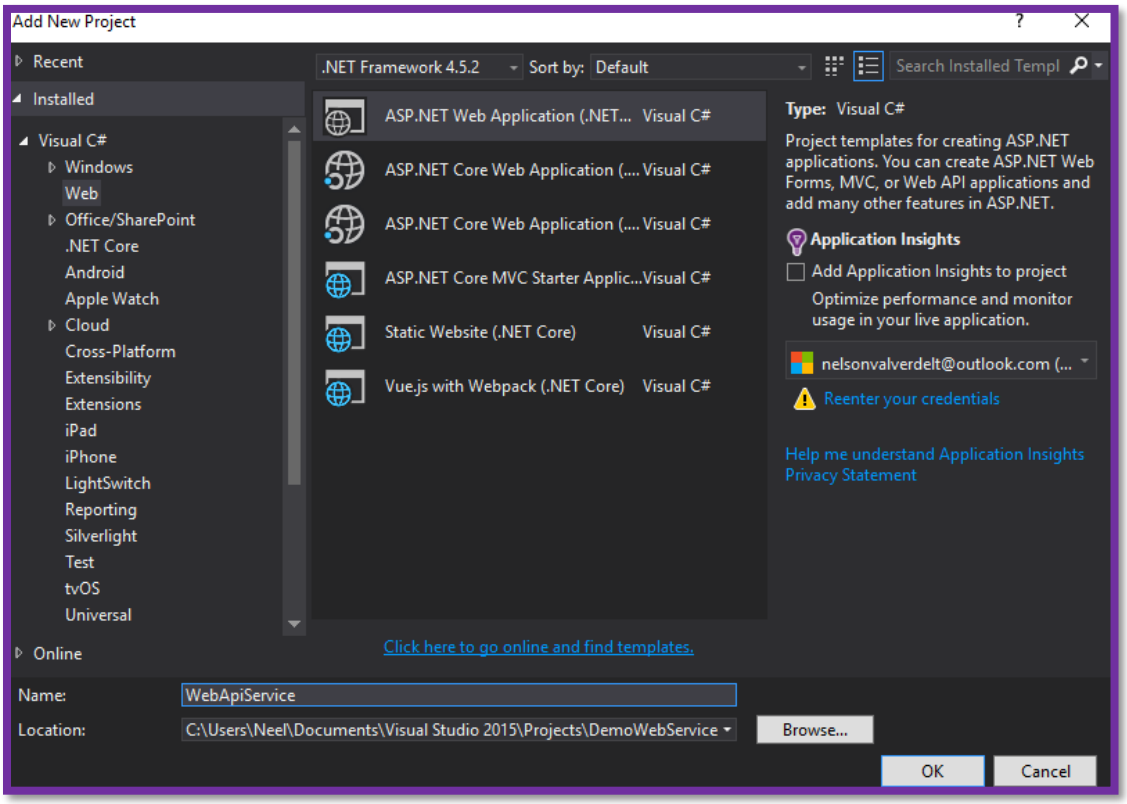
- ✓ It supports convention-based CRUD Actions since it works with HTTP verbs GET, POST, PUT and DELETE.
- ✓ Responses have an Accept header and HTTP status code.
- ✓ Responses are formatted by Web API's MediaTypeFormatter into JSON, XML or whatever format you want to add as a MediaTypeFormatter.
- ✓ It may accept and generates the content which may not be object oriented like images, PDF files etc.
- ✓ It has automatic support for OData. Hence by placing the new [Queryable] attribute on a controller method that returns IQueryable, clients can use the method for OData query composition.
- ✓ It can be hosted with in the applicaion or on IIS.
- ✓ It also supports the MVC features such as routing, controllers, action results, filter, model binders, IOC container or dependency injection that makes it more simple and robust.

SETP 1 - CREATE A NEW PROJECT

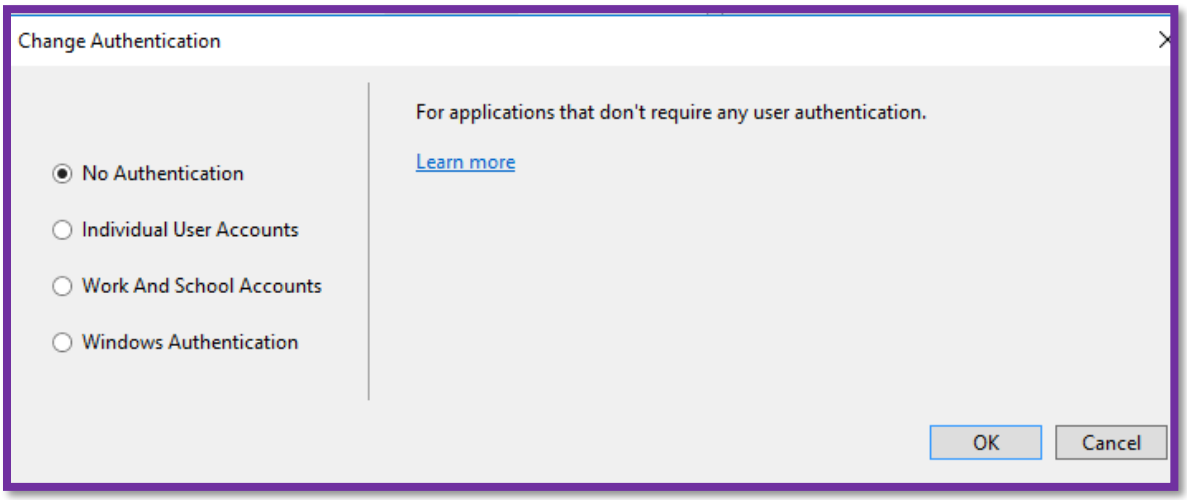
- For this example, we need continue in our project of the same solution "DemoWebServices",



- Then we need add a new project with the name “WebApiService”



- Select **Web Api,** then we select **Change authentication.**



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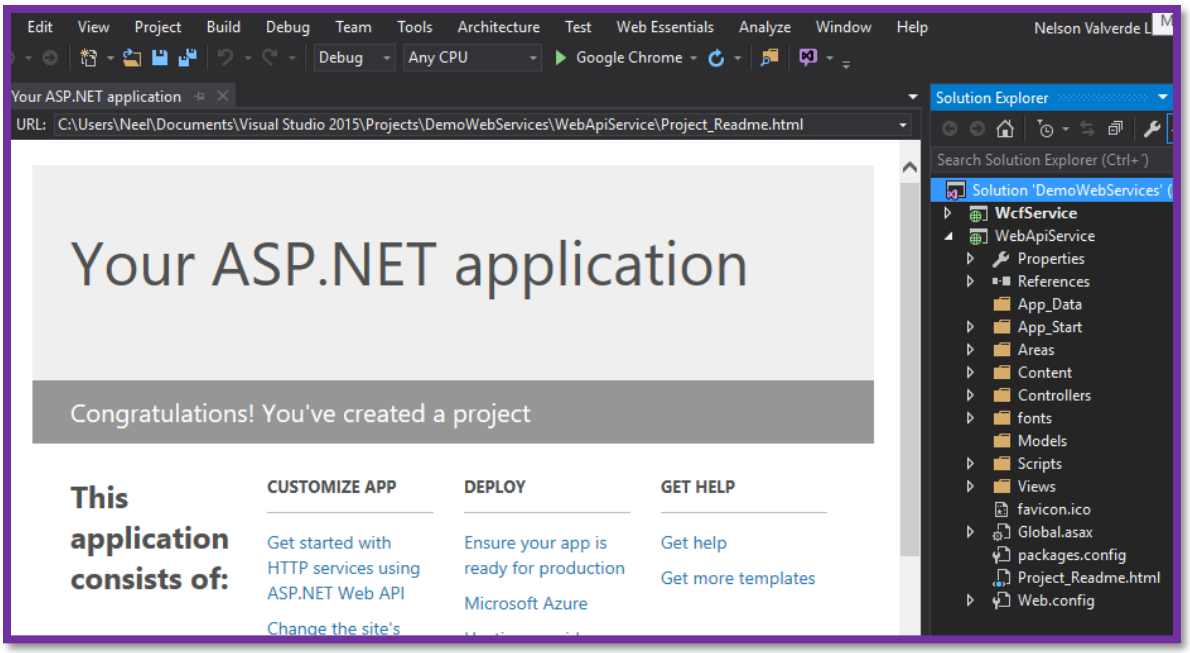
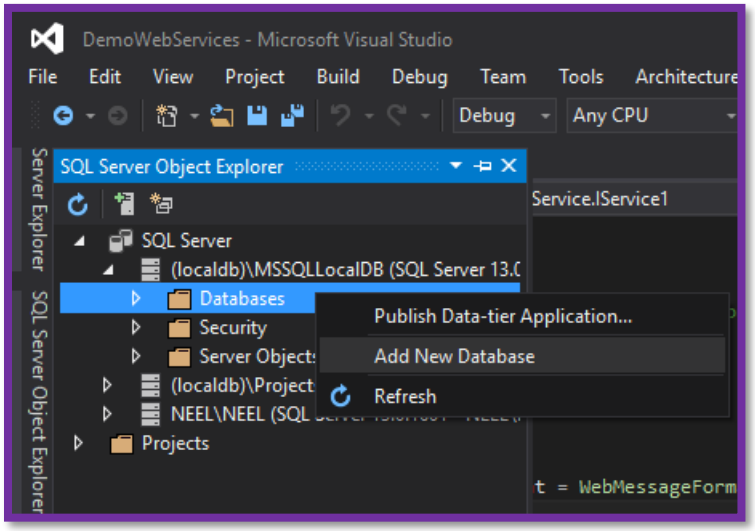
- And we are ready to start our project with Web Api.

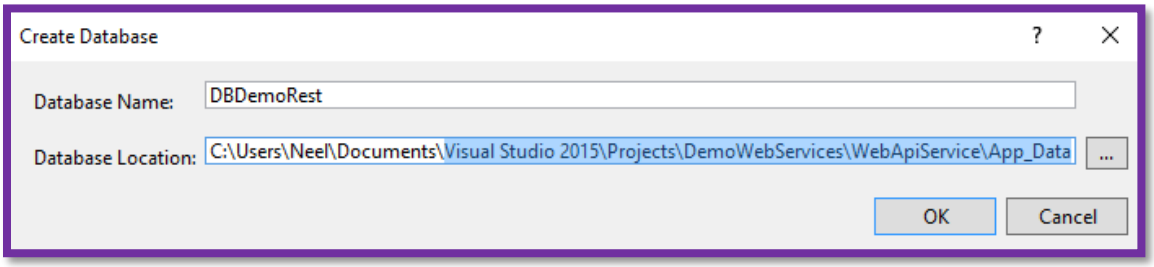


STEP 2 – CREATE OUR DATA BASE LOCAL

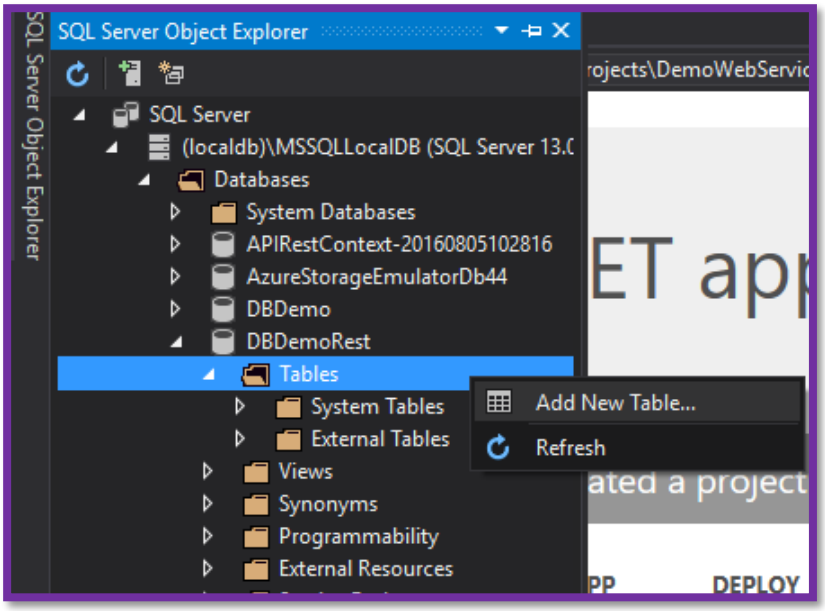
- Select SQL Server Object Explorer and create your local Database.



- Select your Database location, this having objective create a file local database with extension ".mdf", usually I select my file **App_Data** of project **(recommend).**



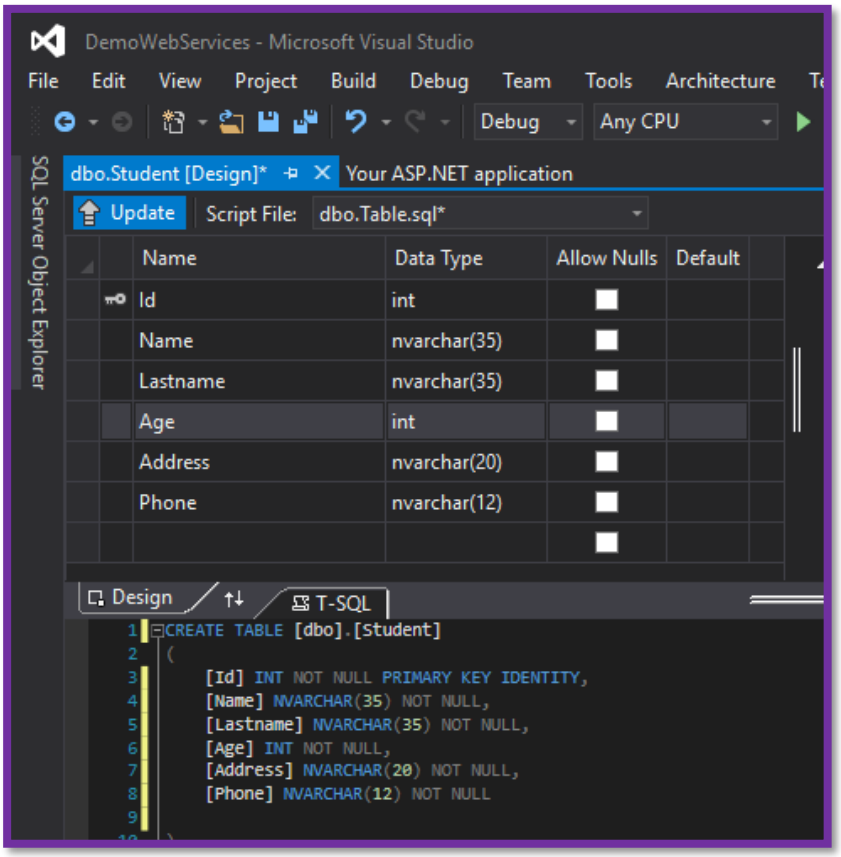
- Select our table file and add new table



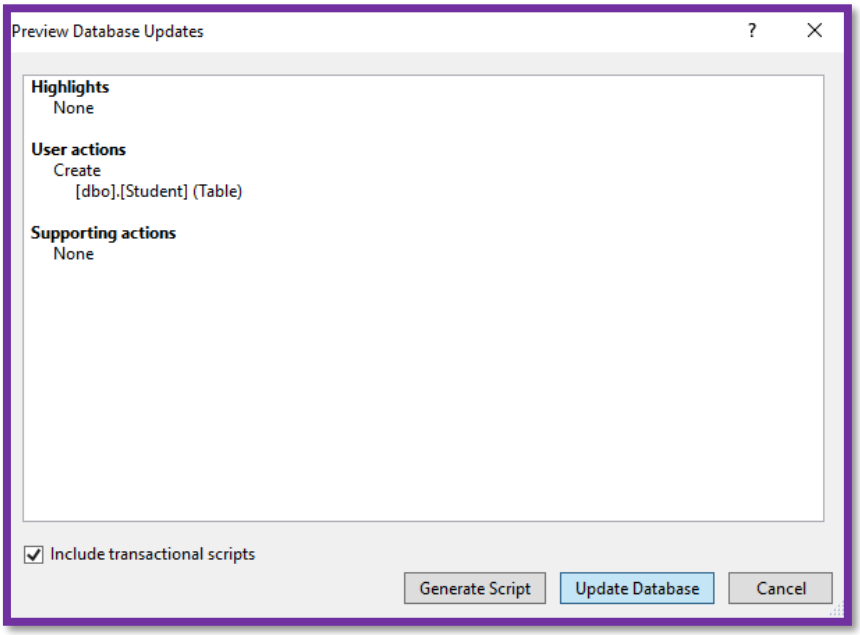
- Add a table “Employees” for this example, Add our attributes:

  [Id, Name, Lastname, Address, Phone] and “update” database.

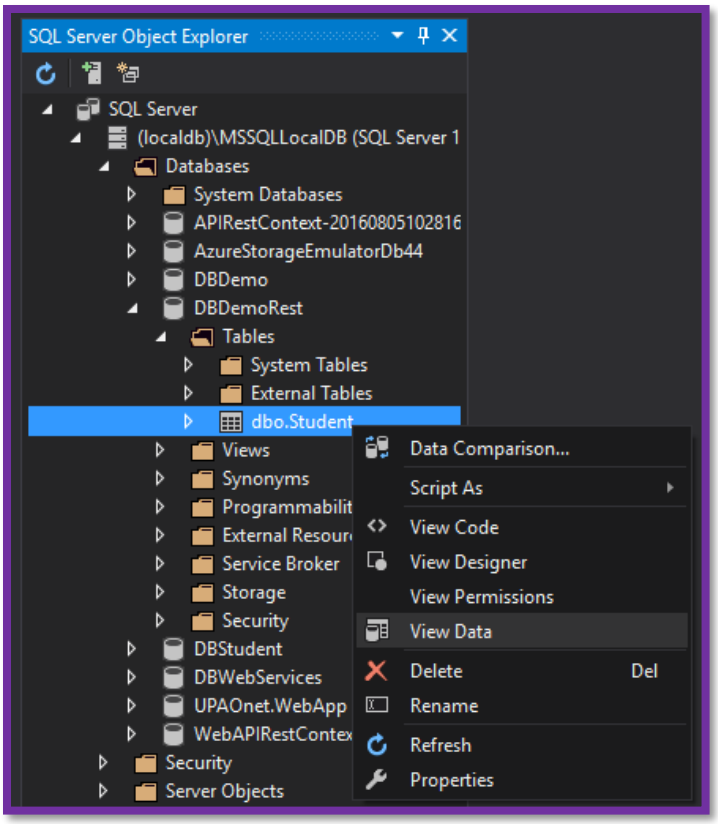
  And last but not least select **Update**



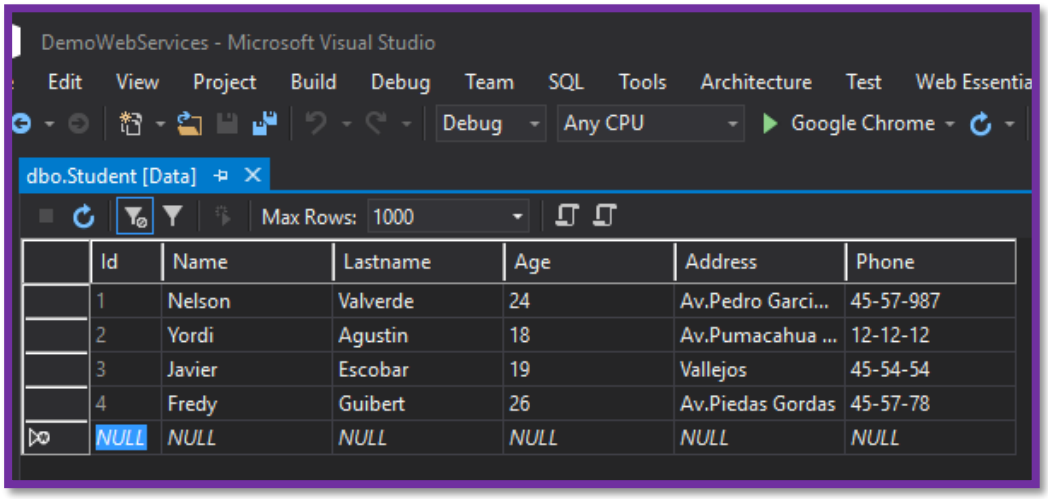
- This is a preview of the new update our database and finish with **Update Database**



- Now we need add data in our table of database

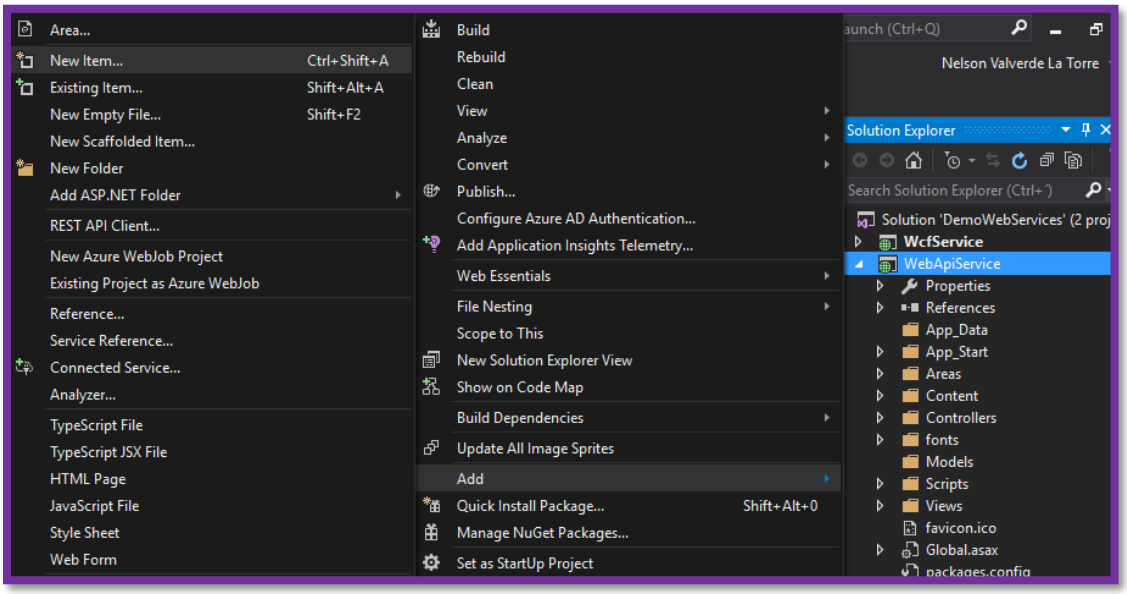


- Complete our table with data

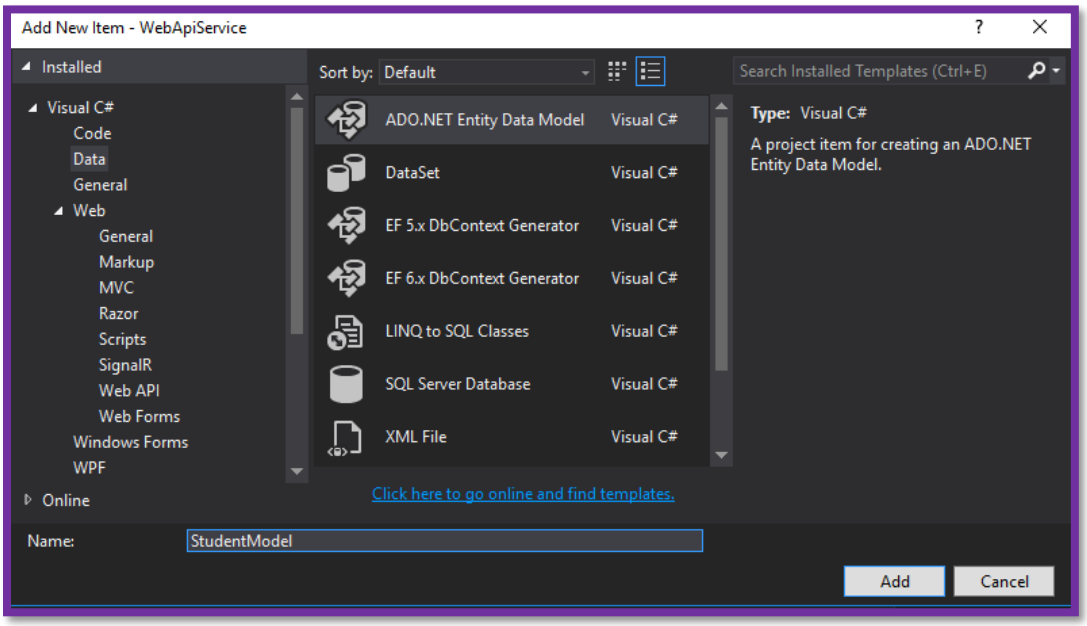


STEP 3 – CREATE OUR DATA MODEL WITH ENTITY FRAMEWORK

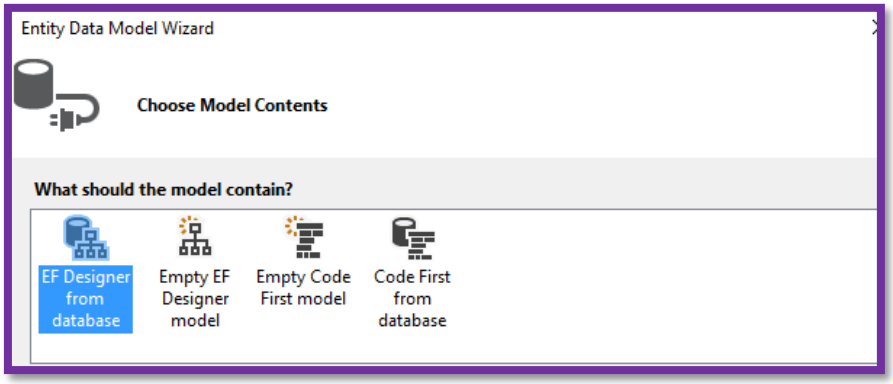
- We create a new Item



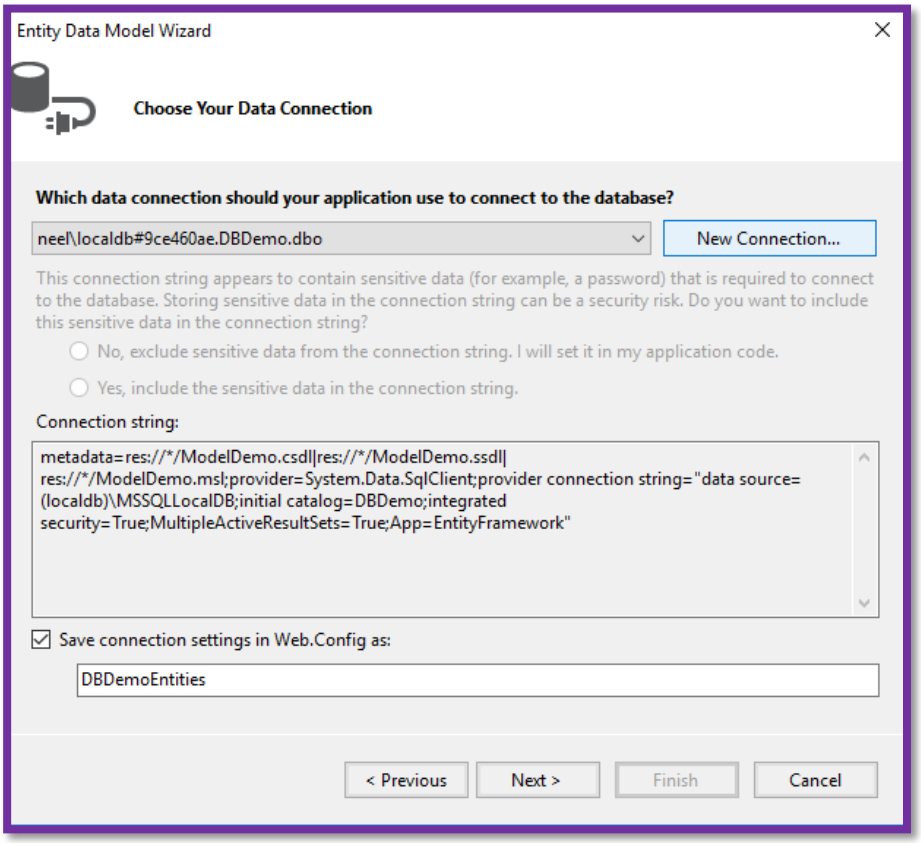
- Select ADO.NET Entity Data Model and add the name **StudentModel,** ADO.NET its located in **Visual C# / Data,**



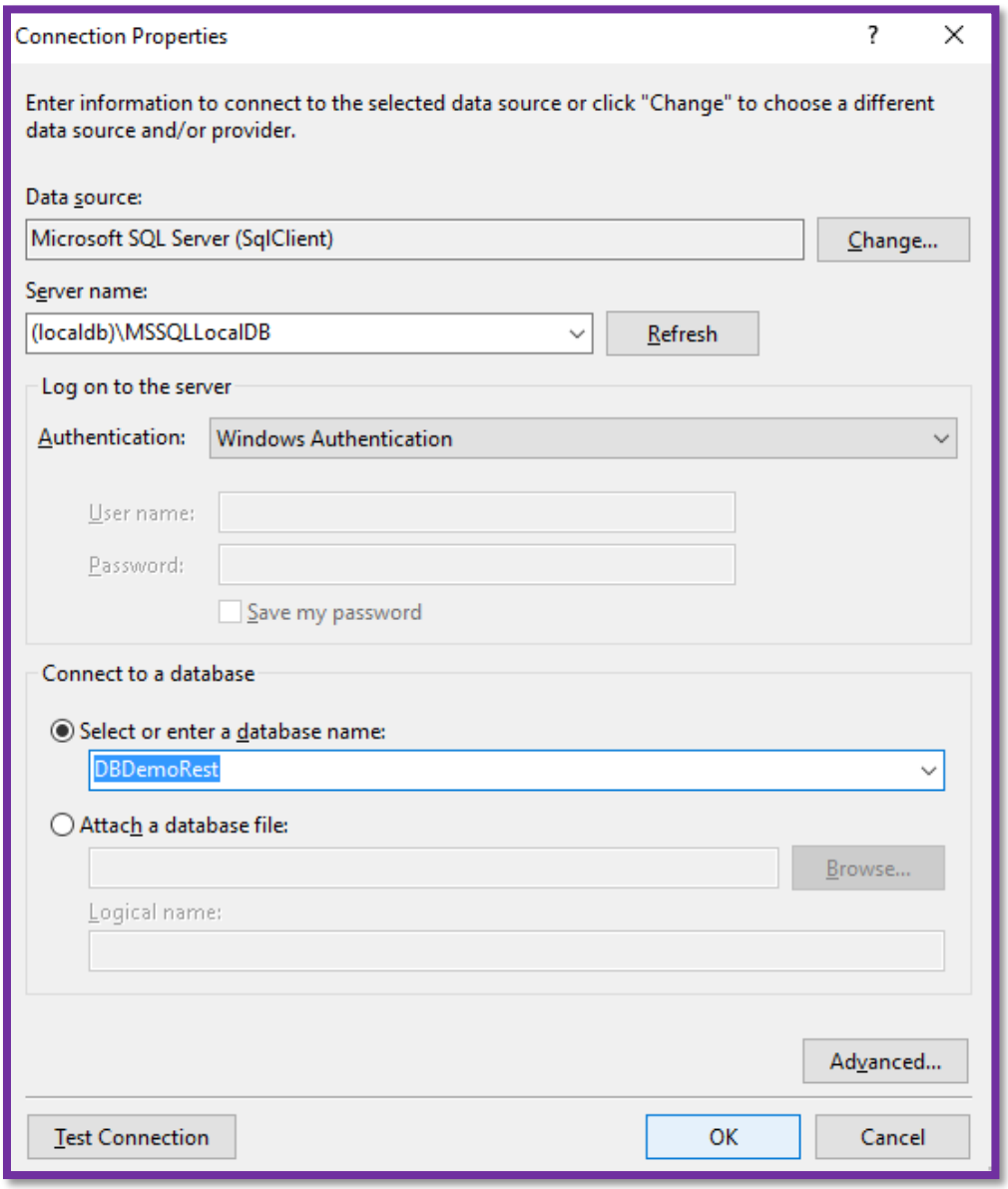
- Select **EF Designer From Database** and Next



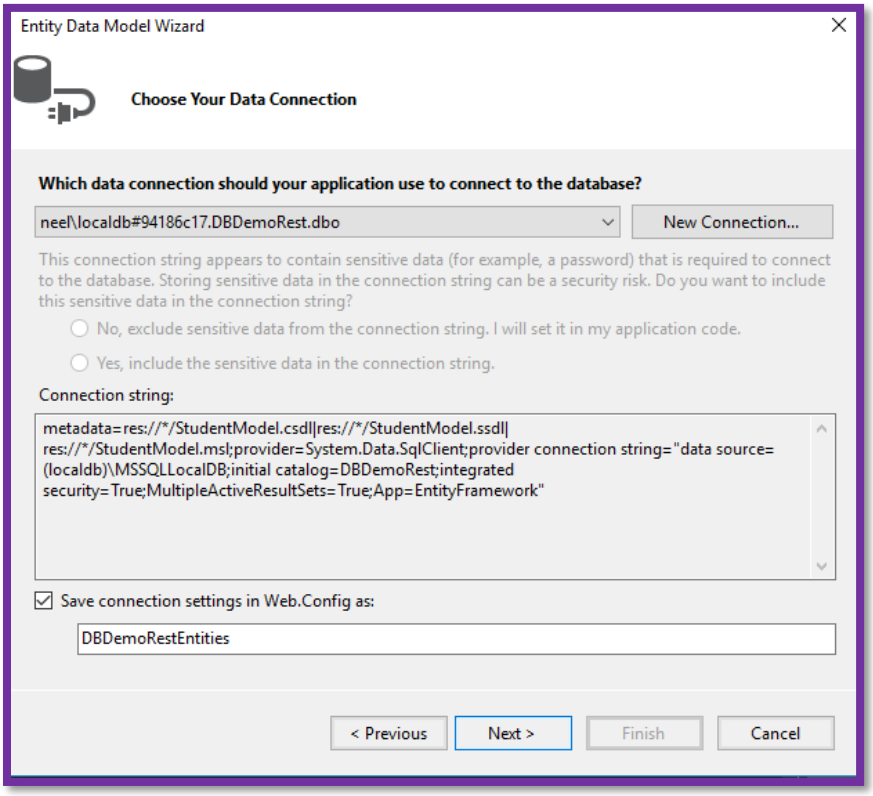
✓ Select **New Connection,** this allows generate a new connection with our database local



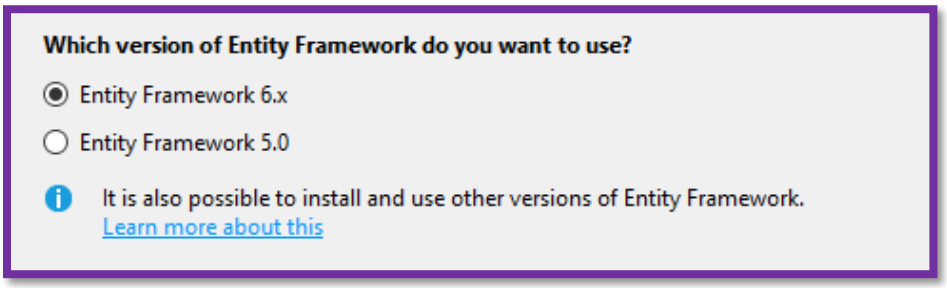
- Now, we need to make some settings in connection properties



- Click Next →



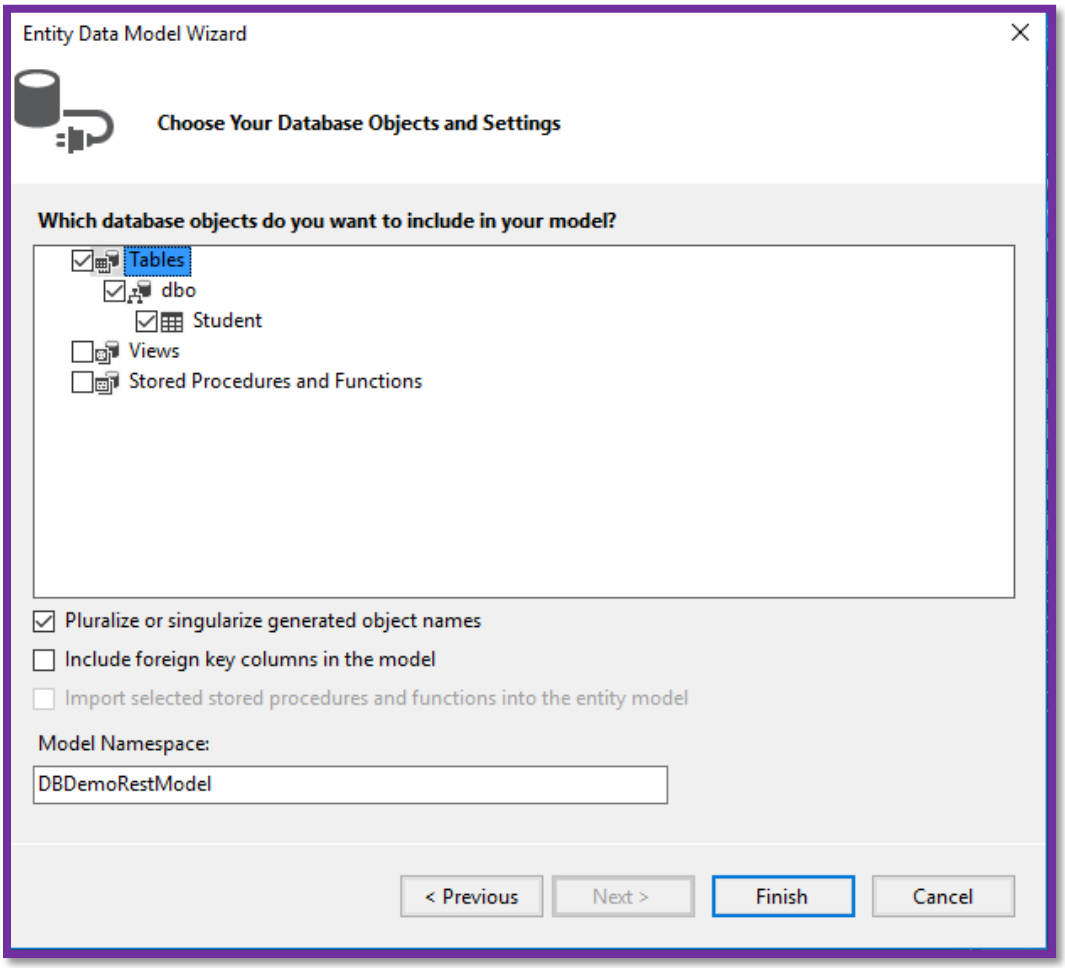
- Select Entity Framework 6.x and **Next**



- Select our table

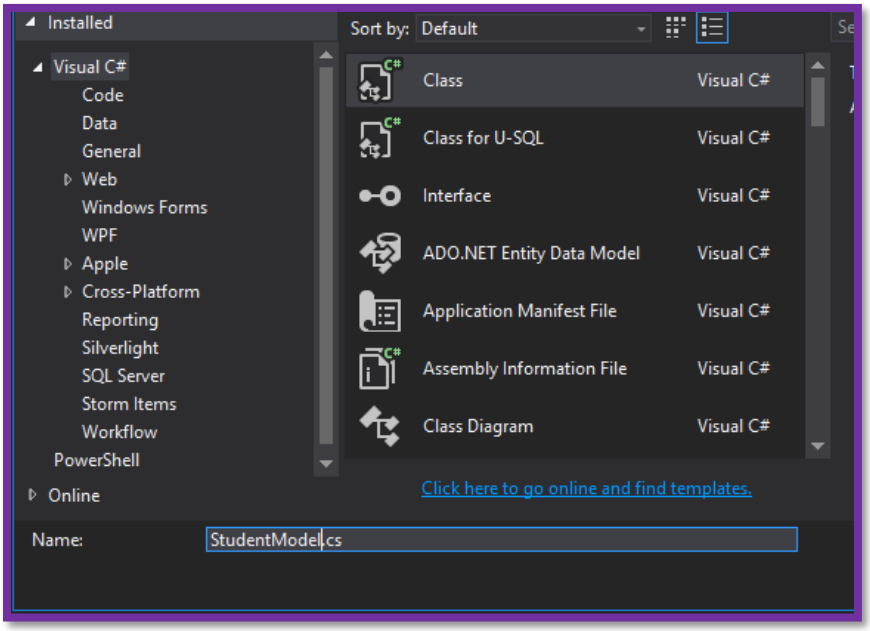
Select the table for the mapping into our file .edmx and assign a name.

An .**edmx** file contains the the conceptual model, as well as a storage model and the mappings between them.

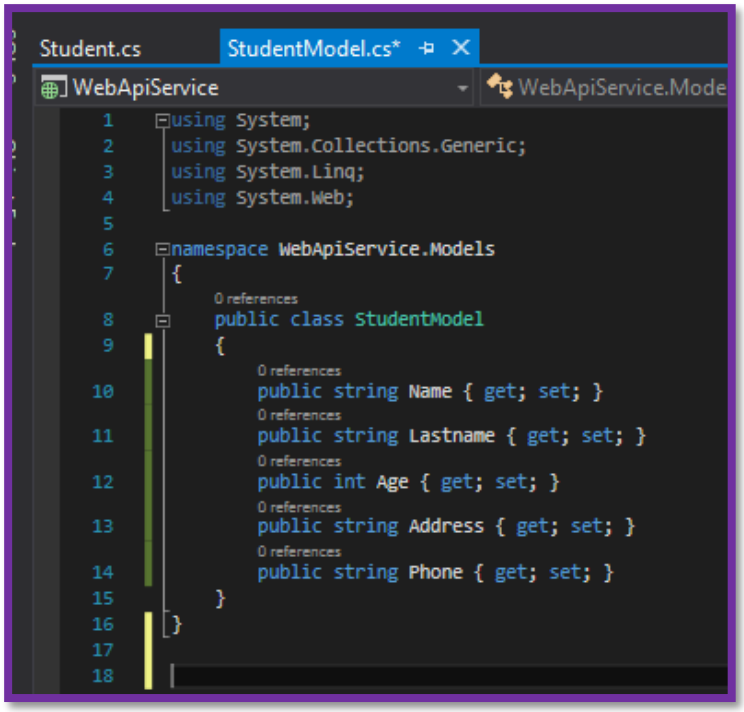


STEP 4 – CREATE OUR MODEL

- Create our model in the folder **"Models"** and assign a name **"StudentModel"**

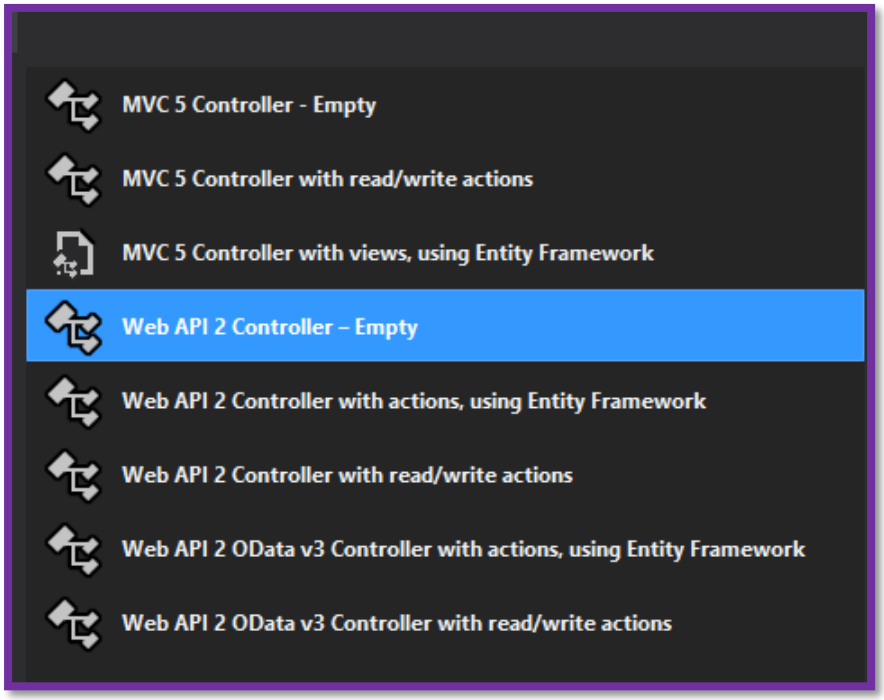


- Add our attributes or the data we need

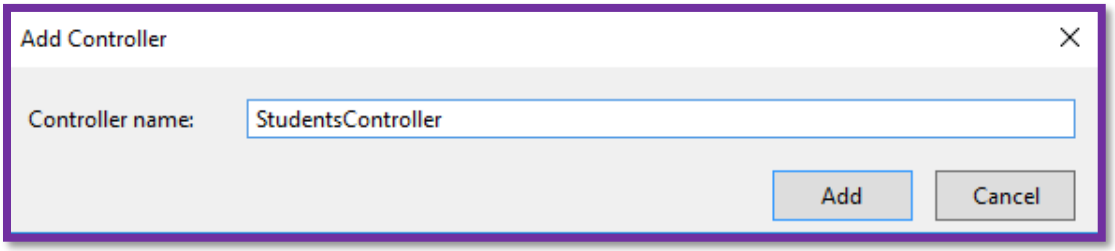


STEP 5 – CREATE OUR CONTROLLER WITH API CONTROLLER

- Create our Controller in the folder **"Controllers"**



- Assign a Name



- Add **"Using"** for this controller

```
// New usings
using System.Threading.Tasks;
using WebApiService.Models;
using System.Web.Script.Serialization;
```

- Add our instance, this allow connect a database and create a method **GetStudents**

```
namespace WebApiService.Controllers
{
    0 references
    public class StudentsController : ApiController
    {
        //Instantance Database
        DBDemoRestEntities db = new DBDemoRestEntities();

        //GET --> api/Students
        0 references
        public List<StudentModel> GetStudents()
        {
            var query = from s in db.Students
                        select new StudentModel()
                        {
                            Name = s.Name,
                            Lastname = s.Lastname,
                            Age = s.Age,
                            Address = s.Address,
                            Phone = s.Phone
                        };

            return query.ToList();
        }
```

-

- Create a method **GetStudents** with a parameter id of type integer

```
//GET --> api/Students/{id}
0 references
public StudentModel GetStudents(int id)
{
    var query = from s in db.Students
                where s.Id == id
                select new StudentModel()
                {
                    Name = s.Name,
                    Lastname = s.Lastname,
                    Age = s.Age,
                    Address = s.Address,
                    Phone = s.Phone
                };

    return query.FirstOrDefault();
}
```

- Create a method PostStudents, this need a parameter **HttpRequestMessage**, this allow obtain a request JSON

```
//POST --> api/Students
0 references
public async Task<bool> PostStudents(HttpRequestMessage request)
{
    // The ModelState represents a collection of name and value pairs that were submitted
    // to the server during a POST
    if (ModelState.IsValid)
    {
        //Read pur Json
        var jsonString = await request.Content.ReadAsStringAsync();

        //Instance Serializer
        var jss = new JavaScriptSerializer();

        //Deserialize our json
        StudentModel student = jss.Deserialize<StudentModel>(jsonString);

        //save the deserialized data in our Model generated with Entity Framework
        var _student = new Student()
        {
            Name = student.Name,
            Lastname = student.Lastname,
            Age = student.Age,
            Address = student.Address,
            Phone = student.Phone
        };

        //Add a new element
        db.Students.Add(_student);
        //Save changes of our table
        db.SaveChanges();

        return true;

    }
    else
    {
        return false;
    }

}
```

- Create a method **PutStudents** and need two parameters

  Id: Parameter in url.

  HttpRequestMessage,: this allow obtain a request JSON

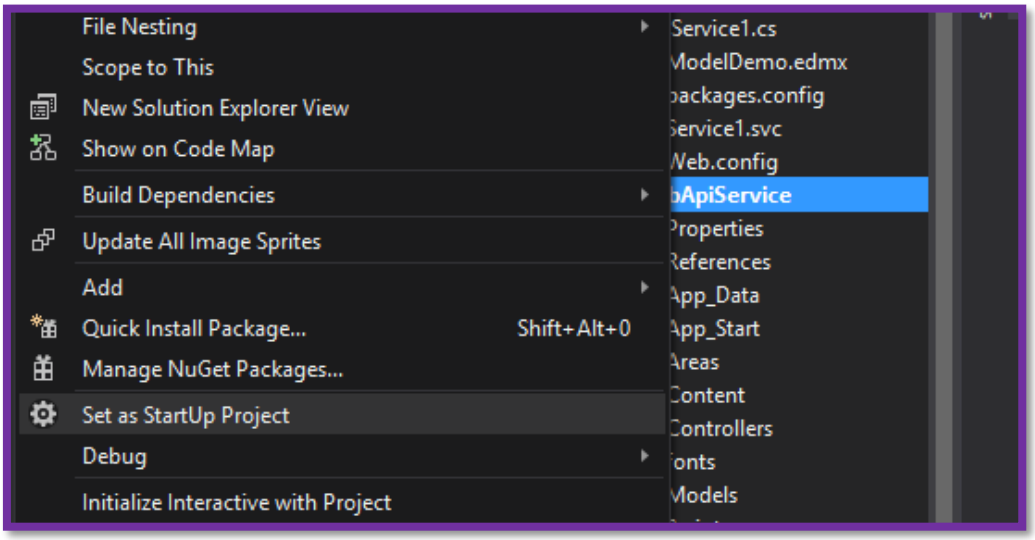
```
//PUT --> api/Students/{id}
0 references
public async Task<string> PutStudents(int id, HttpRequestMessage request)
{

    //Read pur Json
    var jsonString = await request.Content.ReadAsStringAsync();

    //Instance Serializer
    var jss = new JavaScriptSerializer();

    //Deserialize our json
    StudentModel student = jss.Deserialize<StudentModel>(jsonString);

    var query = from st in db.Students
                where st.Id == id
                select st;

    //Iterate and assign a new data for our table
    foreach (Student item in query)
    {
        item.Name = student.Name;
        item.Lastname = student.Lastname;
        item.Age = student.Age;
        item.Address = student.Address;
        item.Phone = student.Phone;
    };

    try
    {
        //Save changes
        db.SaveChanges();
        return "OK";

    }catch(Exception ex)
    {
        return ex.Message;
    }

}
```

- Create a method **DeleteStudents** with a parameter **id**

```
    //Delete --> api/GetStudents/{id}
    0 references
    public string DeleteStudents(int id)
    {
        try
        {

            var query = from st in db.Students
                        where st.Id == id
                        select st;

            foreach (var item in query)
            {
                db.Students.Remove(item);
            }

            db.SaveChanges();

            return "OK";

        }catch(Exception ex)
        {
            return ex.Message;
        }



    }

}
```

STEP 6 – WE PREPARE OUR PROJECT

1) First we need select your project and set as StartUp Project, then we need have open our application web services or F5,



Look this example: we have this direction url:

http://localhost:12102/api/Students/1

http://localhost → This is la direction local of project

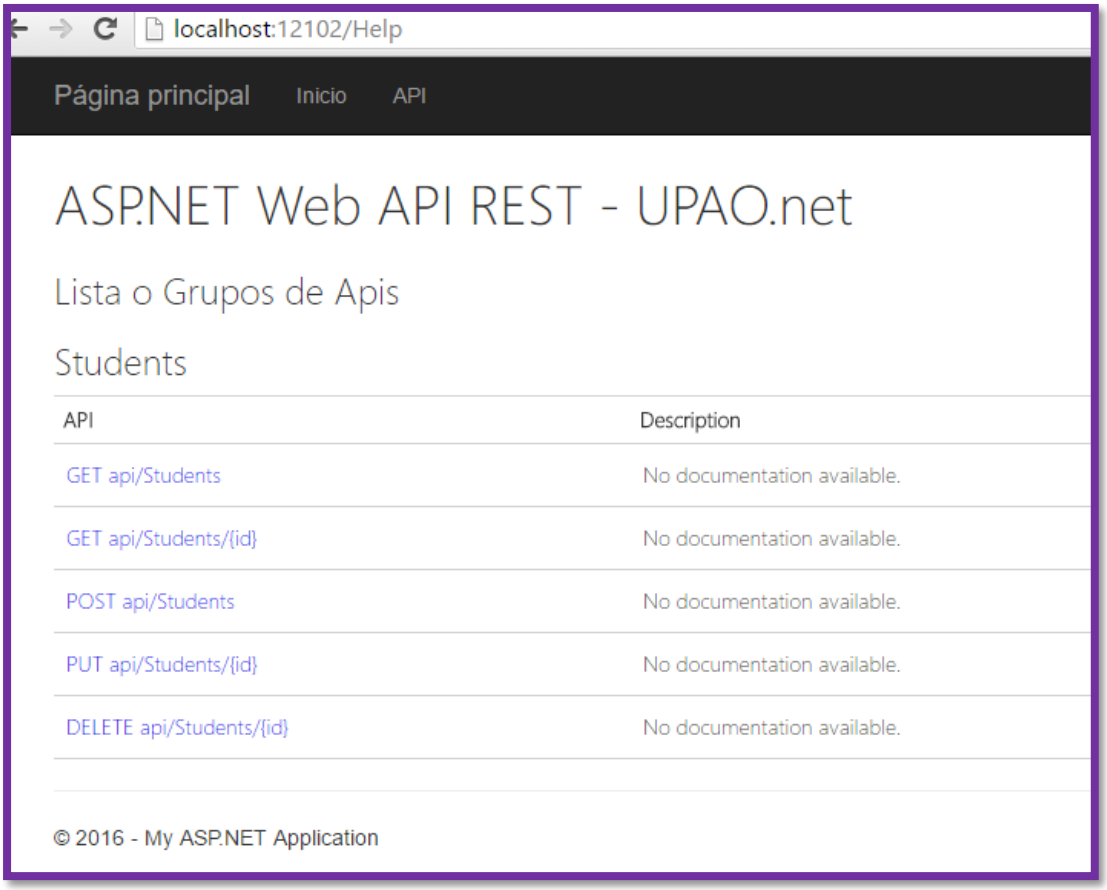
12102 → This is port local, this varies for each project

Api → this segment of our direction is your controller

Students → This is our method of the controller

1 → This is simply the parameter we need for obtain information

2) Then of this example, open our browser, add **help** the end of the direction URL, look this



This example we have 5 Apis:

1. GET → api/Students

   It is equivalent to → http://localhost:12102/api/Students

2. GET → api/Students/{id}

   It is equivalent to → http://localhost:12102/api/Students/{id}

3. POST → api/Students

   It is equivalent to → http://localhost:12102/api/Students

4. PUT → api/Students/{id}

   It is equivalent to → http://localhost:12102/api/Students/{id}

5. DELETE → api/Students/{id}

   It is equivalent to → http://localhost:12102/api/Students/{id}

Important:

GET: Obtain or retrieve something

POST: Create a resource.

PUT: Update or Modify a resource

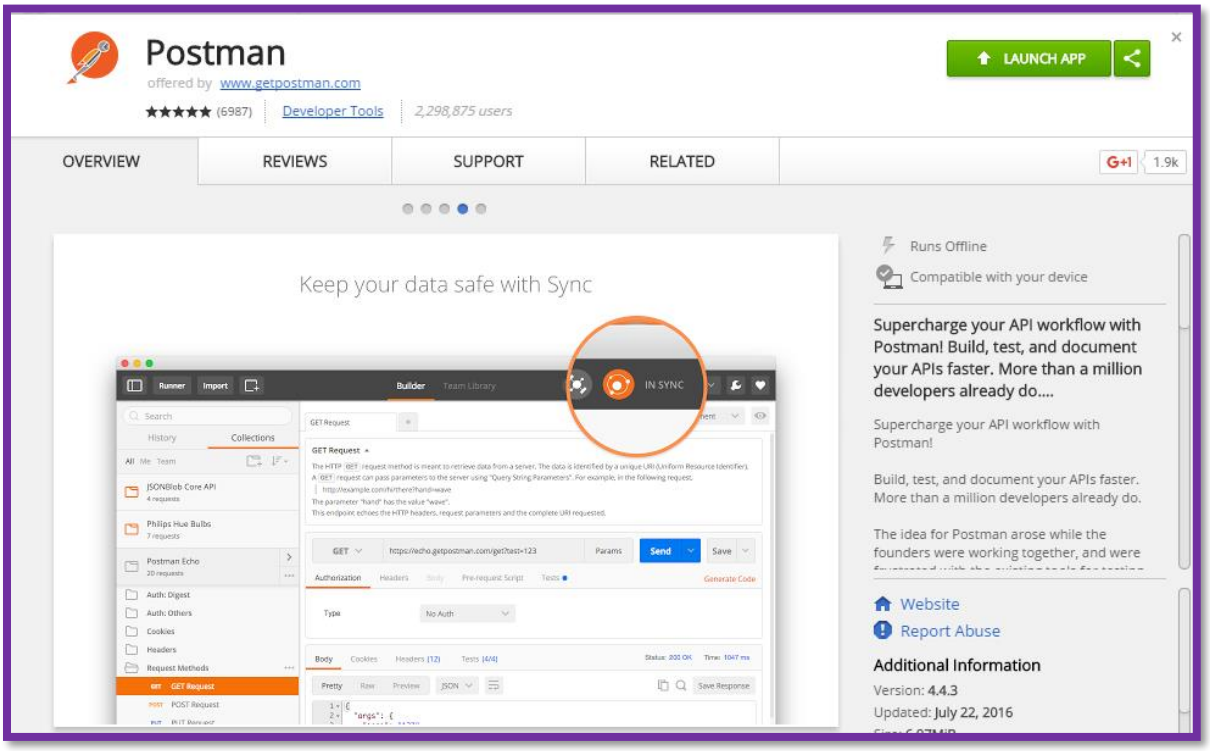
DELETE: Delete a resource

WE PREPARE OUR TOOL

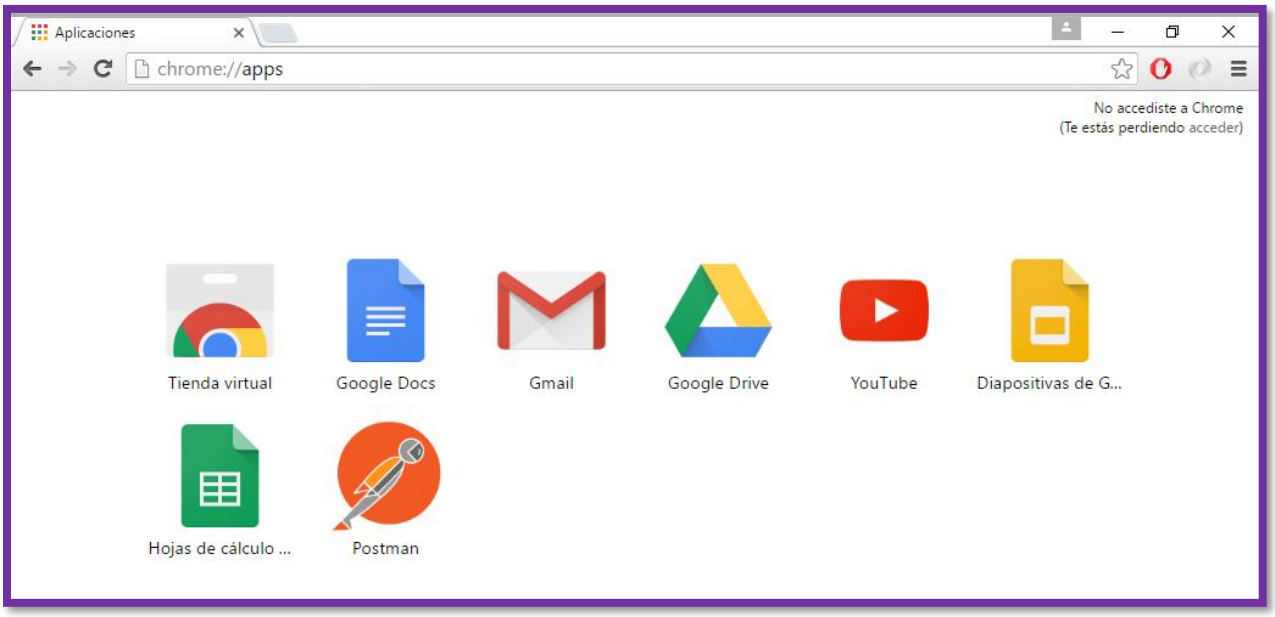
1) Now we need Add an extension in Chrome

Link:

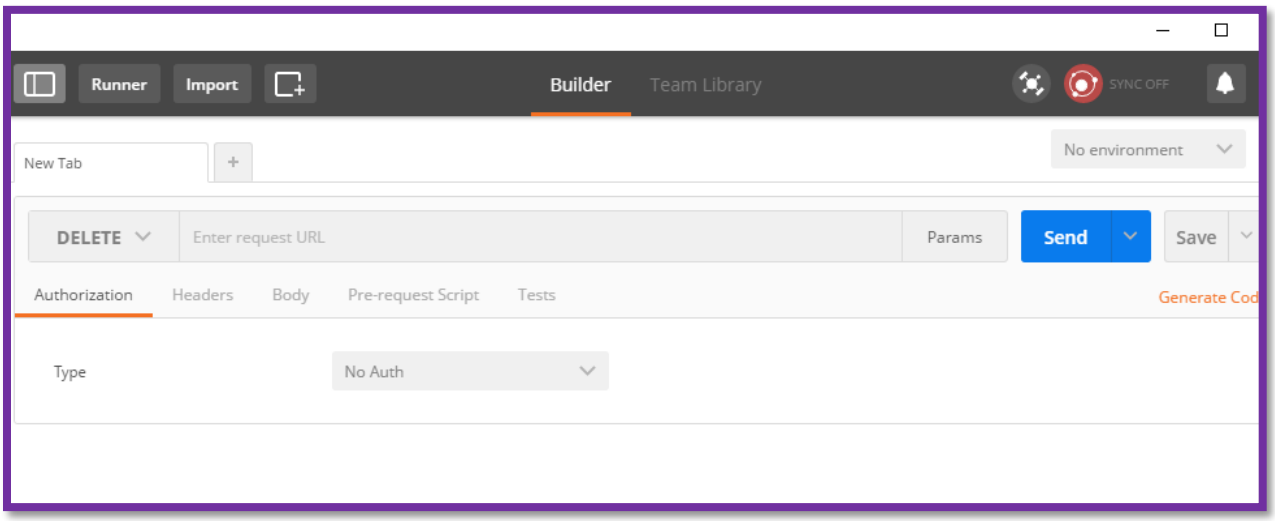
https://www.getpostman.com/



2) Now we need verify in our extension of chrome and we:



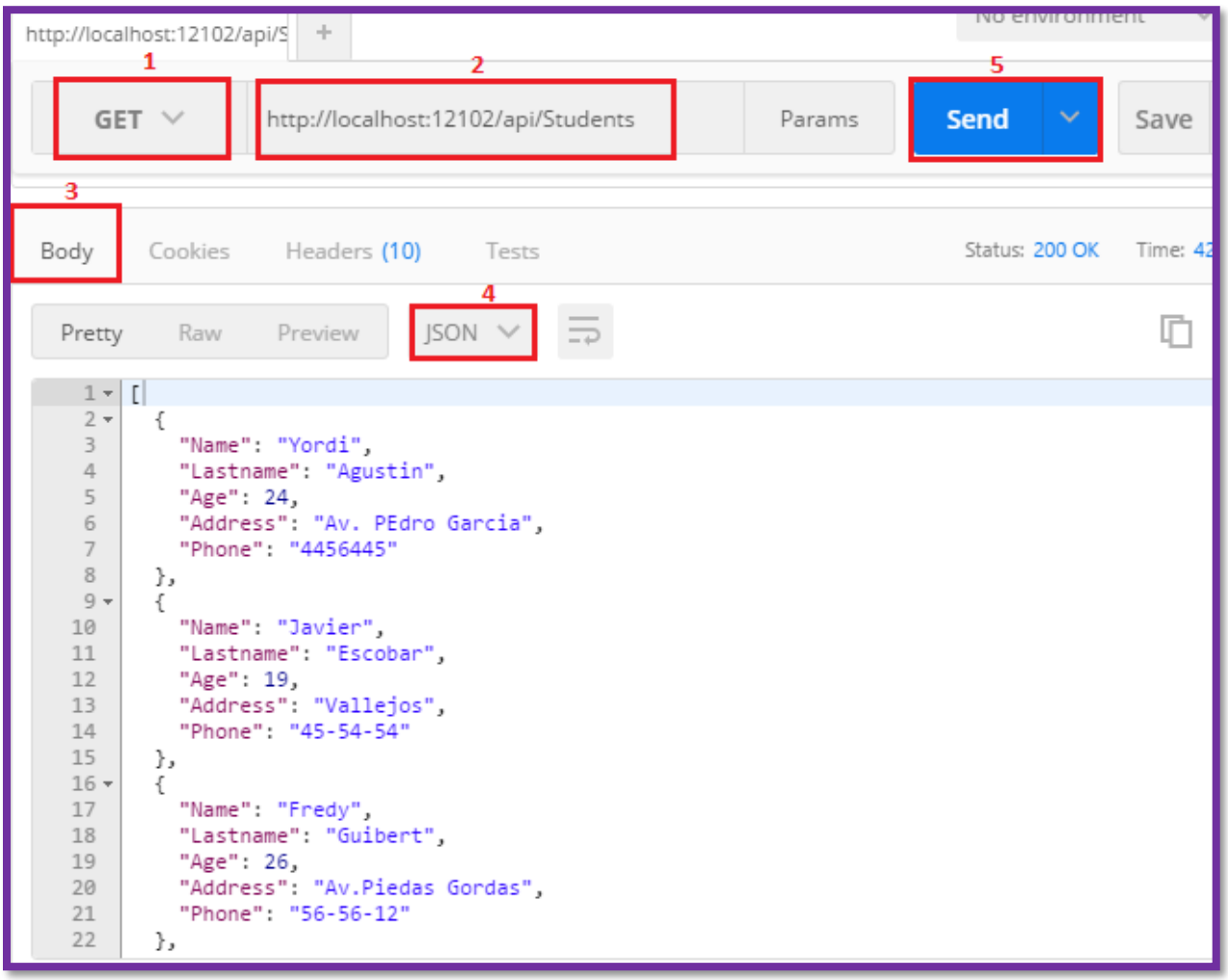
3) We open application and we find something like this:



4) We open out first api of type **GET**:

In my case it is:

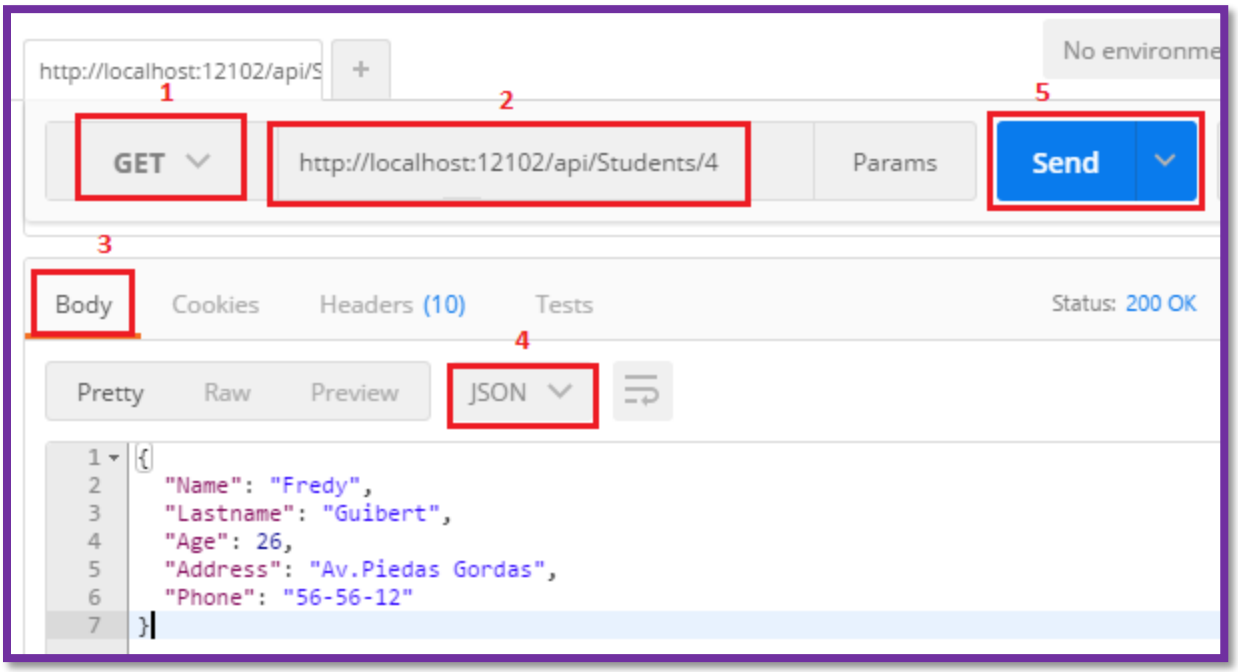
http://localhost:12102/api/Students



5) We open out second api of type **GET** with a parameter {id}:

In my case it is:

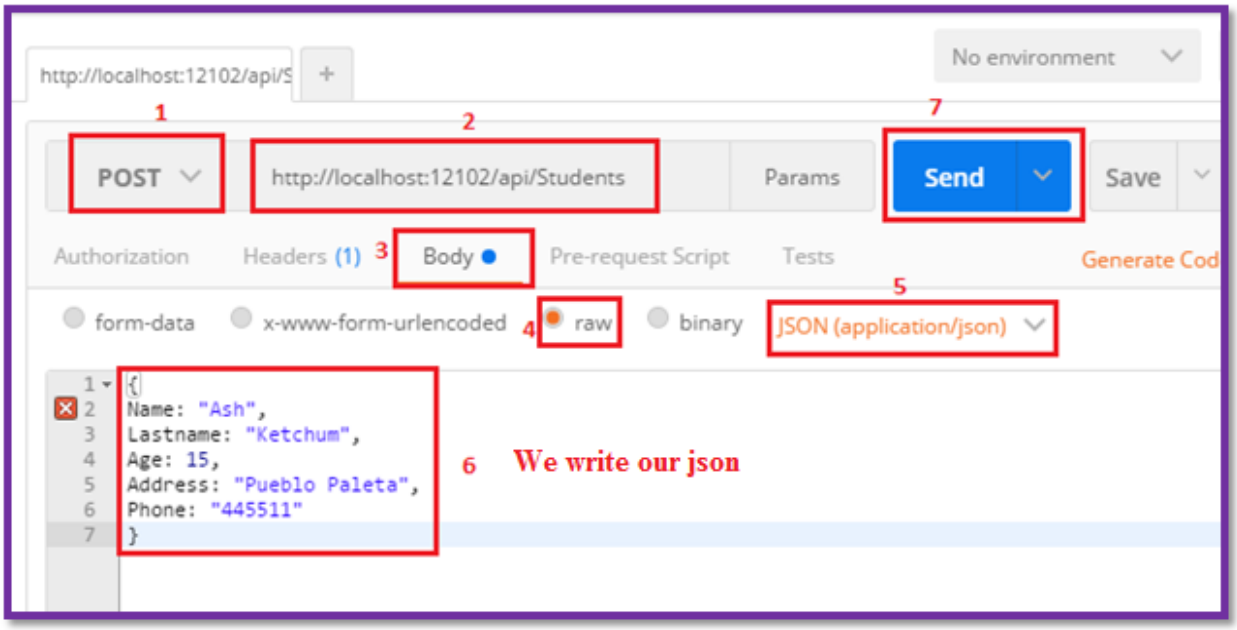
http://localhost:12102/api/Students/{id} → **{id} = 1,2,3,4,5,6,7**



6) We open out third api of type **POST**:

In my case it is:

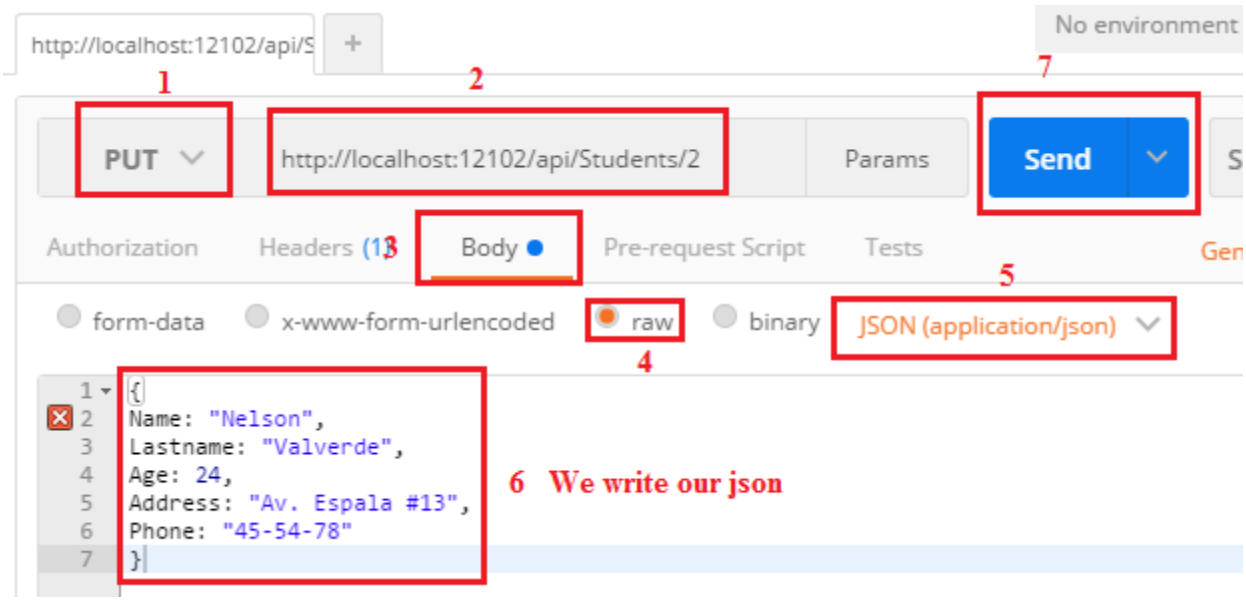
http://localhost:12102/api/Students



7) We open out fourth api of type **PUT**:

In my case it is:

http://localhost:12102/api/Students/{id} → **{id} = 1,2,3,4,5,6,7**



8) We open out fifth api of type **DELETE**:

In my case it is:

http://localhost:12102/api/Students/{id} → **{id} = 1,2,3,4,5,6,7**