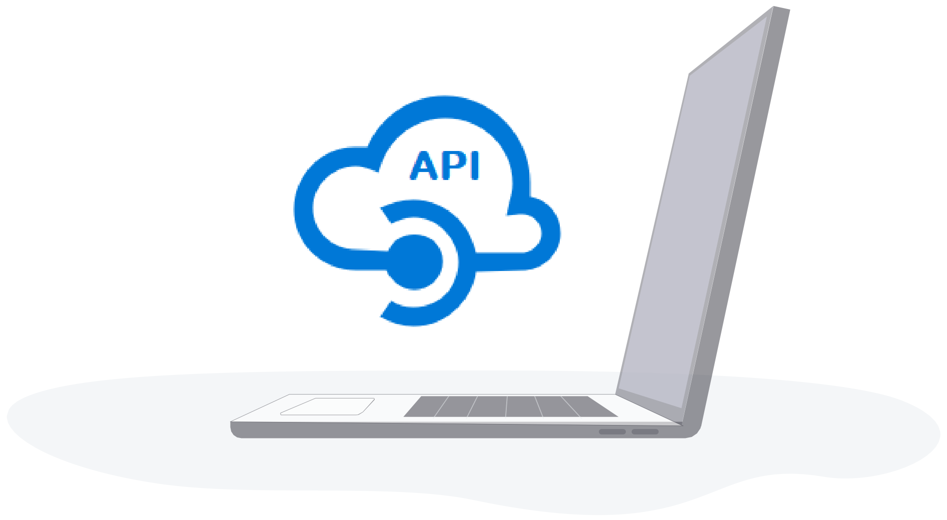
Harmony IT Solution

Web Application Programming Interface (API)

Tahaluf Training Center 2022


API

Overview of Data Transfer Object (DTOs)

Data Transfer Objects or DTOs are objects that carry data between processes used to reduce the number of functions calls.

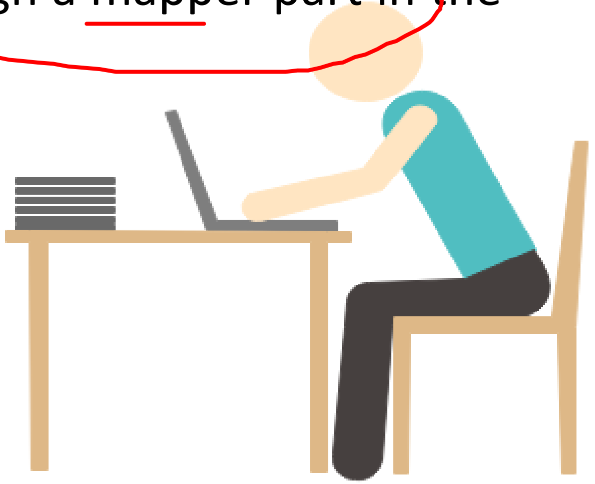
The pattern was first introduced by Martin Fowler EAA book. It is used to reduce the network overhead in such remote operations and encapsulate of the serialization's logic.

How to Use DTOs?

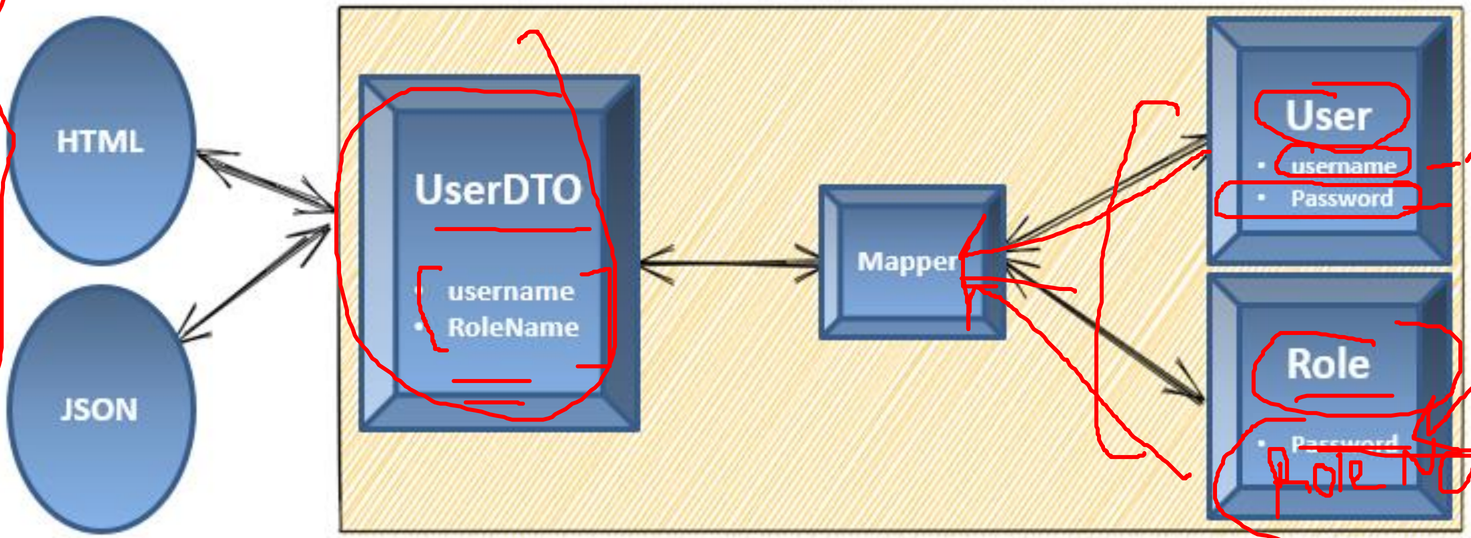
A DTO is an object that defines how the data will be sent over the network. They **are flat data structures that contain no business or data logic.** They contain only accessors, storage, and methods related to parsing or serialization.

The data is mapped from the data access models to the DTOs, through a mapper part in the presentation layer.

logic



The image illustrates the interaction between the components:



When to Use DTOs?

DTOs used in systems with remote calls, because they help to reduce the number of them and when the domain or data access model is composed of many various objects, and the presentation model needs all data at once or even reduces roundtrip between server and client.

When to Use DTOs?

DTOs used to build different views from our domain or data access models and allow to create other representations of the same domain, but optimizing them to the clients' needs without affecting our domain design.

Overview of Data Filtering

Data filtering can refer to a wide range of solutions or strategies for refining data sets.

The data sets are refined into simply what a user needs, without including other data that can be irrelevant, repetitive, or even sensitive.

Different types of data filters can be used to amend query, reports, results, or other kinds of information results.

Create a Filter using DTO

In stdcourse_Package package specification Add a SearchStudentAndCourse Stored Procedure:

PROCEDURE SearchStudentAndCourse(cName in varchar , sName in varchar , DateFrom in date , DateTo in date);

In stdcourse_Package package body Add a SearchStudentAndCourse Stored Procedure:

```
PROCEDURE SearchStudentAndCourse(cName in varchar , sName in varchar ,
DateFrom in date , DateTo in date)
As
Get_Cur SYS_REFCURSOR;
Begin
open Get_Cur for
select s.firstname , s.LastName , c.CourseName , sc.markofstd
from Student s
inner join stdCourse sc
```

In stdcourse_Package package body Add a SearchStudentAndCourse Stored Procedure:

```
on s.studentid = sc.stdid
inner join course c
on c.courseid = sc.courseid
where (upper(s.firstname) like '%'||upper(sName) ||'%') -- null
And ( upper( c.coursename) like '%' || upper( cname) || '%') -- S
And (DateFrom is null or DateTo is null or  sc.DateofRegister between DateFrom
and DateTo);
dbms_sql.return_result(Get_Cur);
End SearchStudentAndCourse;
```

Create a DTOs

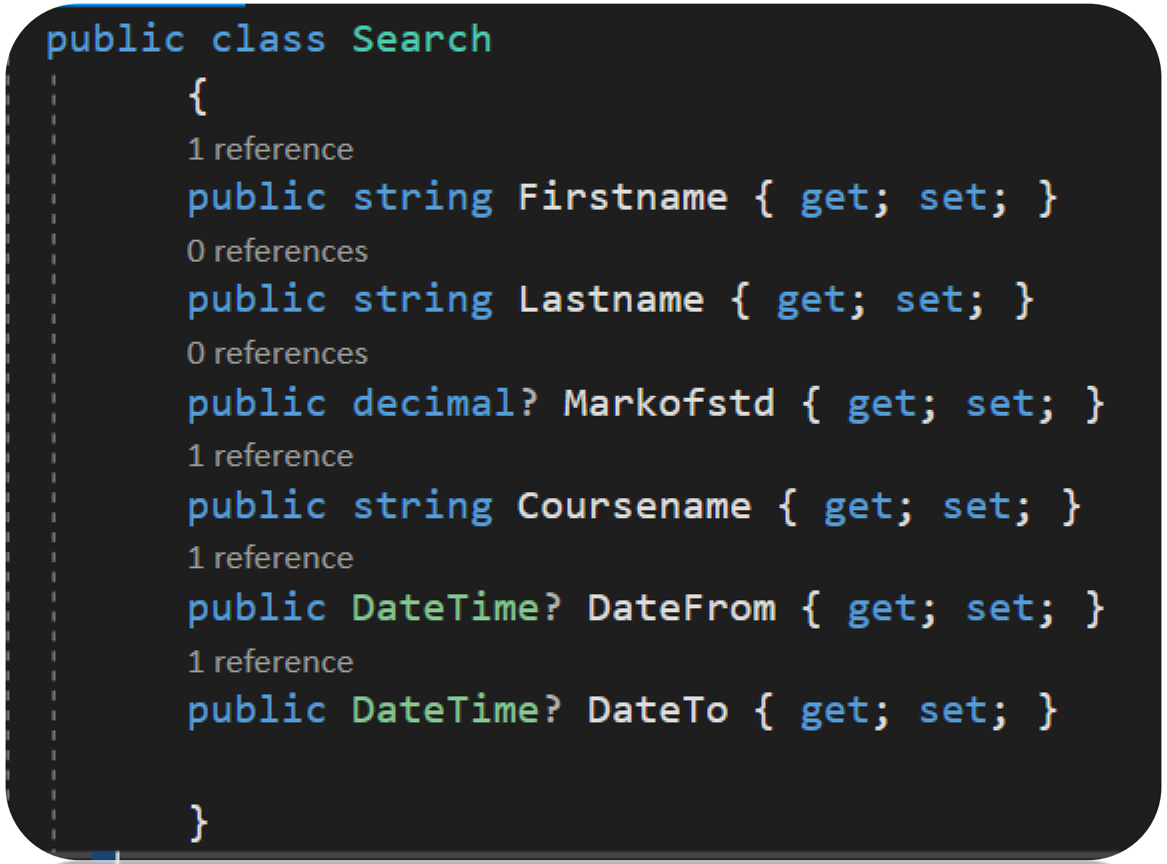
Right Click on TahalufLearn.Core => Add New Folder => DTO.

Right Click on DTO => Add Class => Search.

Search DTO Code:

```
public class Search
        {
        public string Firstname { get; set; }
        public string Lastname { get; set; }
        public decimal? Markofstd { get; set; }
        public string Coursename { get; set; }
        public DateTime? DateFrom { get; set; }
        public DateTime? DateTo { get; set; }

        }
```



```
public class Search
        {
        1 reference
        public string Firstname { get; set; }
        0 references
        public string Lastname { get; set; }
        0 references
        public decimal? Markofstd { get; set; }
        1 reference
        public string Coursename { get; set; }
        1 reference
        public DateTime? DateFrom { get; set; }
        1 reference
        public DateTime? DateTo { get; set; }

        }
```

In TahalufLearn.Core => Repository => IStudentCourseRepository add the following abstract method:

```
List<Search> SearcheStudenCourse(Search search);
```

In TahalufLearn.Infra => Repository => StudentCourseRepository add the following method:

```
 public List<Search> SearcheStudenCourse(Search search)
            {
            var p = new DynamicParameters();
            p.Add("sName", search.Firstname, dbType: DbType.String,
direction: ParameterDirection.Input);
            p.Add("DateFrom", search.DateFrom, dbType:
DbType.DateTime, direction: ParameterDirection.Input);
            p.Add("DateTo", search.DateTo, dbType: DbType.DateTime,
direction: ParameterDirection.Input);
            p.Add("cName", search.Coursename, dbType:
DbType.String, direction: ParameterDirection.Input);
            var result =
dBContext.Connection.Query<Search>("stdcourse_Package.SearchStudent
AndCourse", p, commandType: CommandType.StoredProcedure);
            return result.ToList();
            }
```

In TahalufLearn.Core => Service => IStudentCourseService add the following abstract methods:

```
List<Search> SearcheStudenCourse(Search search);
```

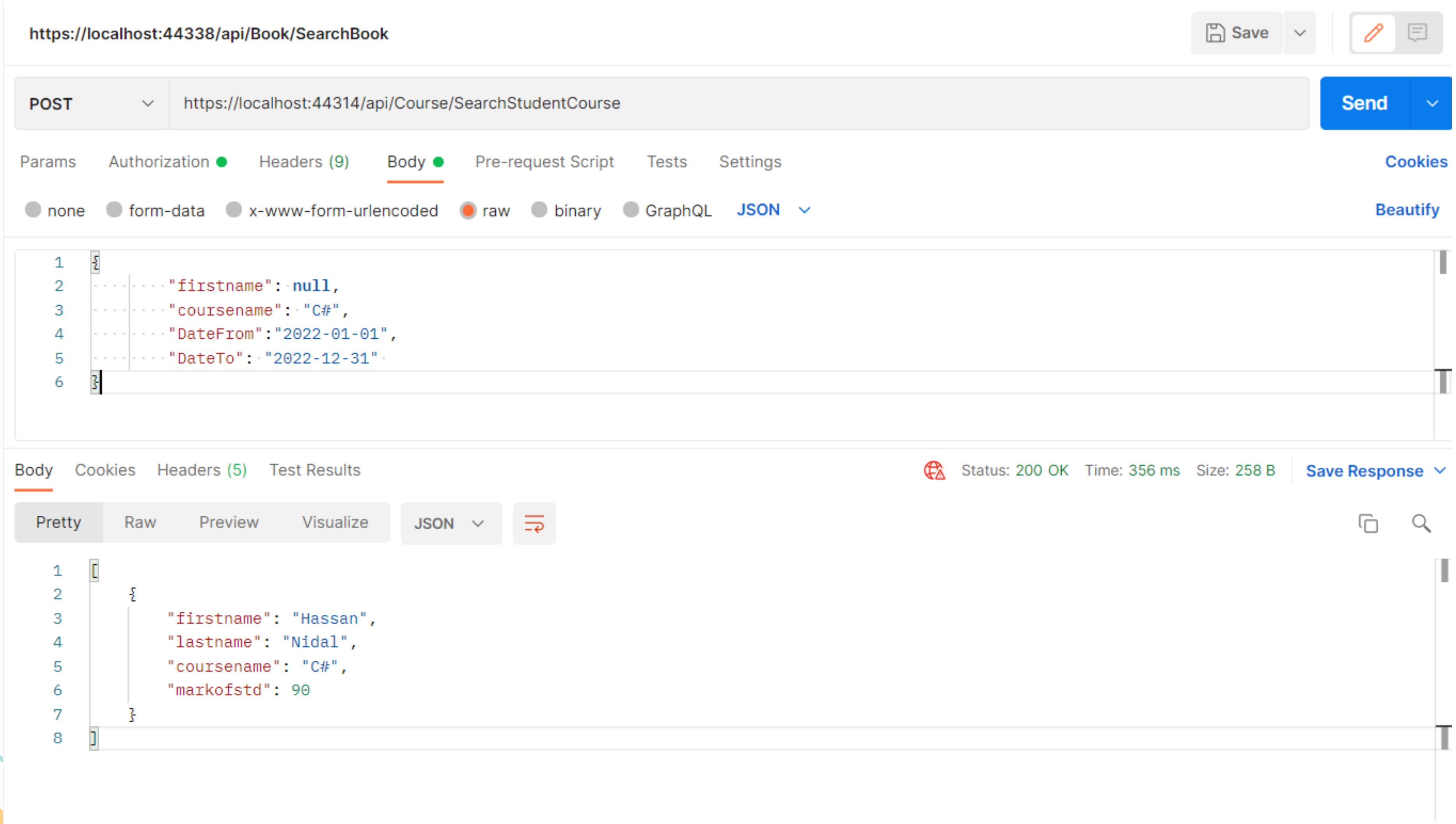
In TahalufLearn.Infra => Service => StudentCourseService add the following method:

```
public List<Search> SearcheStudenCourse(Search search)
          {
         return _studentCourseRepository.SearcheStudenCourse(search);
          }
```

In TahalufLearn.API => Controler => StudentCourseController add the following method:

```
 [HttpPost]
        [Route("SearcheStudenCourse")]
        public List<Search> SearcheStudenCourse(Search search)
            {
            return
_studentCourseService.SearcheStudenCourse(search);
            }
```

Harmony IT Solution



https://localhost:44338/api/Book/SearchBook

POST https://localhost:44314/api/Course/SearchStudentCourse

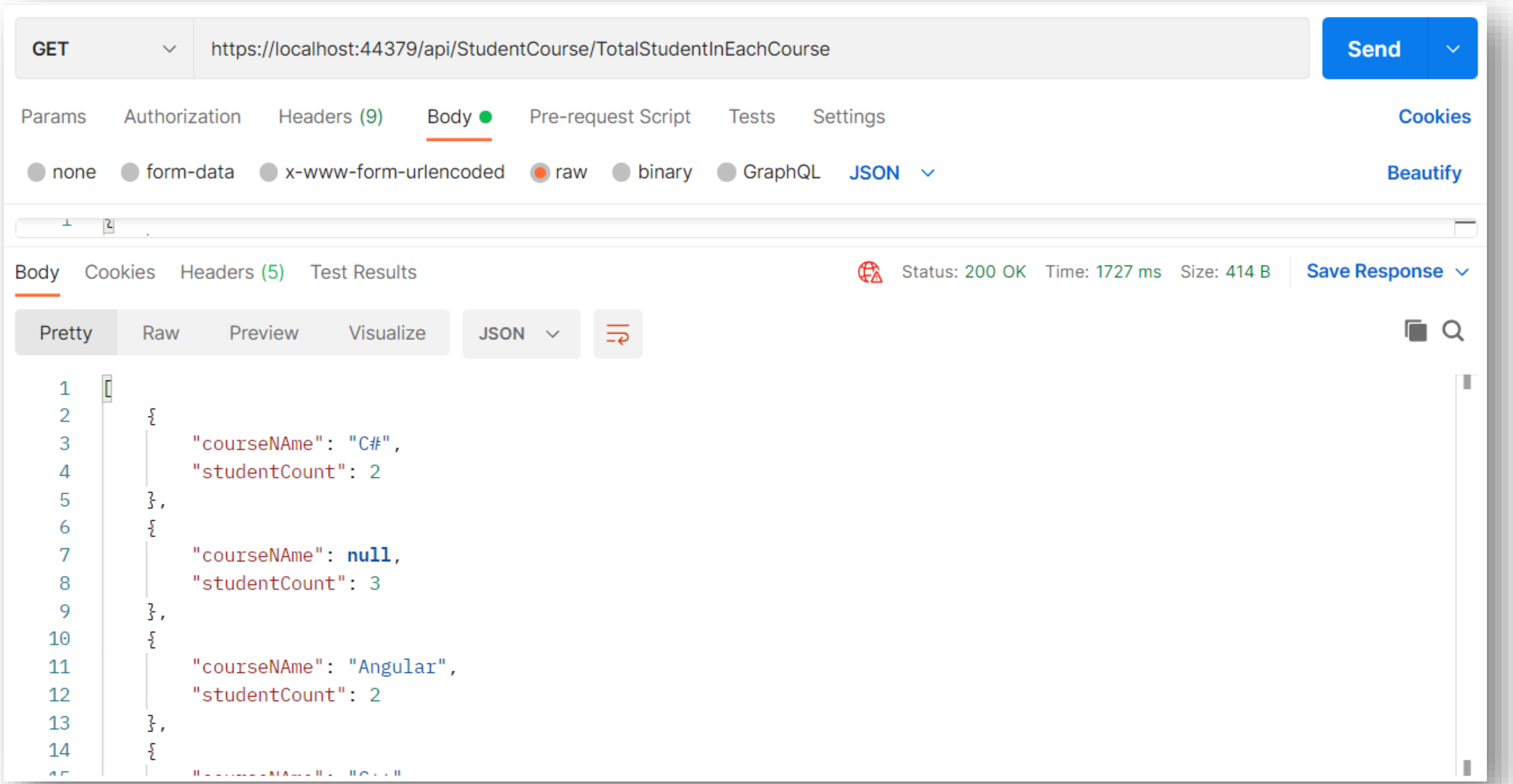
```
{
    "firstname": null,
    "coursename": "C#",
    "DateFrom":"2022-01-01",
    "DateTo": "2022-12-31"
}
```

Status: 200 OK Time: 356 ms Size: 258 B

```
[
    {
        "firstname": "Hassan",
        "lastname": "Nidal",
        "coursename": "C#",
        "markofstd": 90
    }
]
```

Exercise

Create a function to retrieve the total number of students in each course.



GET https://localhost:44379/api/StudentCourse/TotalStudentInEachCourse

Status: 200 OK Time: 1727 ms Size: 414 B

```
[
    {
        "courseNAme": "C#",
        "studentCount": 2
    },
    {
        "courseNAme": null,
        "studentCount": 3
    },
    {
        "courseNAme": "Angular",
        "studentCount": 2
    },
    {
```