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# System Requirements Specification Index

For

## College Management Application

Version 1.0

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# College Management SYSTEM

## System Requirements Specification

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### 1. BUSINESS-REQUIREMENT:

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#### 1.1 PROBLEM STATEMENT:

**College Management** Application is a simple .Net Core 3.1 RESTful Web API application with MS Sql server, where it manages students, departments and teachers. Every student detail should have the properties like student id, name, department. Every teacher detail should have the properties like teacher id, name, department.

#### 1.2 FOLLOWING IS THE REQUIREMENT SPECIFICATION:

	College Management Application
1	Teacher
2	Student
Department Module Functionalities	
	1.Create a department
	2.Can delete a department
	3.Get department Info by department name
	4.Fetch all departments
	5.Get department info by department id
Student Module Functionalities	
	1.Create a student
	2.Can delete a student
	3.Get student Info by student name
	4.Fetch all students
	5.Get student info by student id
Teacher Module Functionalities	
	1.Create a teacher

	2.Can delete a teacher
	3.Get teacher Info by teacher name
	4.Fetch all teachers
	5.Get teacher info by teacher id

## 2. ASSUMPTIONS, DEPENDENCIES, RISKS / CONSTRAINTS

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### 2.1 Student Constraints

- While adding a student details, if student is already existing, it should throw a custom exception
- While deleting the student, ensure that student already exists, if not, the operation should throw a custom exception

### 2.2 Teacher Constraints

- The teacher and student Details are connected through a field department name – applying integrity constraint

### 2.3 Common Constraints

- For all rest endpoints receiving @RequestBody, validation check must be done and must throw custom exception if data is invalid
- All the database operations must be implemented on entity object only
- Do not change, add, remove any existing methods in service layer
- In Repository interfaces, custom methods can be added as per requirements.
- All RestEndpoint methods and Exception Handlers must return data wrapped in ResponseEntity
- **All business logic CRUD operations under repository class and write your business logic validation in Services class and related validation use proper user defined exceptions mentioned in above document.**
- **Controller must validate before processing any logic on the database.**

### 2.4 Visitors can perform the follow actions

- Allows to add a new department/student/teacher details
- Allows to delete an existing department/student/teacher
- Allows to search the department/student/teacher on the basis of name
- Allows to display all department/student/teacher

## 2.5 ToolChain

- .NET Core 3.1, RESTful Web API, MS SQL Server.

## 3. BUSINESS VALIDATIONS

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### 3.1 Department Class Entities

- Department Id (long) must be not null and unique, key attribute
- Department Name (string) is not null, min 3 and max 100 characters.

### 3.2 Student Class Entities.

- Student Id (long) is not null, key attribute
- Student Name (String) is not null, min 3 and max 100 characters.
- Department Name (String) is not null, min 3 and max 100 characters.

### 3.2 Teacher Class Entities.

- Teacher Id (long) is not null, key attribute
- Teacher Name (String) is not null, min 3 and max 100 characters.
- Department Name (String) is not null, min 3 and max 100 characters.

## 4. CONSIDERATIONS

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- For Role of application users 2 possible values must be used: -
  1. Student
  2. Teacher

## 5. REST ENDPOINTS

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Rest End-points to be exposed in the controller along with method details for the same to be created

### 5.1 DepartmentController

URL Exposed		Purpose								
<b>/api/Department/Create-Department</b> <table><tr><td>Http Method</td><td>Post</td></tr><tr><td>Parameter 1</td><td>Department department</td></tr><tr><td>Return</td><td>HttpResponse status code</td></tr></table>		Http Method	Post	Parameter 1	Department department	Return	HttpResponse status code	Add new department Details		
Http Method	Post									
Parameter 1	Department department									
Return	HttpResponse status code									
<b>/api/Department/Update-Department</b> <table><tr><td>Http Method</td><td>PUT</td></tr><tr><td>Parameter 1</td><td>Department department</td></tr><tr><td>Return</td><td>HttpResponse status code</td></tr><tr><td></td><td></td></tr></table>		Http Method	PUT	Parameter 1	Department department	Return	HttpResponse status code			Update existing department Details
Http Method	PUT									
Parameter 1	Department department									
Return	HttpResponse status code									
<b>/api/Department/Delete-Department</b> <table><tr><td>Http Method</td><td>DELETE</td></tr><tr><td>Parameter 1</td><td>Long departmentId</td></tr><tr><td>Return</td><td>HttpResponse status code</td></tr></table>		Http Method	DELETE	Parameter 1	Long departmentId	Return	HttpResponse status code	Delete department with given department id.		
Http Method	DELETE									
Parameter 1	Long departmentId									
Return	HttpResponse status code									
<b>/api/Department/Get-Department-By-Id</b> <table><tr><td>Http Method</td><td>GET</td></tr><tr><td>Parameter 1</td><td>Long departmentId</td></tr><tr><td>Return</td><td>&lt;Department&gt;</td></tr></table>		Http Method	GET	Parameter 1	Long departmentId	Return	<Department>	Fetches the department Details with the given department id		
Http Method	GET									
Parameter 1	Long departmentId									
Return	<Department>									
<b>/api/Department/Get-All-Departments</b> <table><tr><td>Http Method</td><td>GET</td></tr><tr><td>Parameter 1</td><td>-</td></tr><tr><td>Return</td><td>&lt;&lt;IEnumerable&lt;Departme nt&gt;&gt;&gt;</td></tr></table>		Http Method	GET	Parameter 1	-	Return	<<IEnumerable<Departme nt>>>	Fetches all the department Details		
Http Method	GET									
Parameter 1	-									
Return	<<IEnumerable<Departme nt>>>									
<b>/api/Department/Search-Department-By-Name</b> <table><tr><td>Http Method</td><td>GET</td></tr><tr><td>Parameter 1</td><td>-</td></tr><tr><td>Return</td><td>&lt;Department&gt;</td></tr></table>		Http Method	GET	Parameter 1	-	Return	<Department>	Fetches the department Details with the given department name		
Http Method	GET									
Parameter 1	-									
Return	<Department>									

## 5.2 StudentController

URL Exposed		Purpose						
<div>/api/Student/Create-Student</div> <table><tr><td>Http Method</td><td>Post</td></tr><tr><td>Parameter 1</td><td>Student student</td></tr><tr><td>Return</td><td>HttpResponse status code</td></tr></table>		Http Method	Post	Parameter 1	Student student	Return	HttpResponse status code	Add new student Details
Http Method	Post							
Parameter 1	Student student							
Return	HttpResponse status code							
<div>/api/Student/Delete-Student</div> <table><tr><td>Http Method</td><td>DELETE</td></tr><tr><td>Parameter 1</td><td>Long studentId</td></tr><tr><td>Return</td><td>HttpResponse status code</td></tr></table>		Http Method	DELETE	Parameter 1	Long studentId	Return	HttpResponse status code	Delete student with given department id.
Http Method	DELETE							
Parameter 1	Long studentId							
Return	HttpResponse status code							
<div>/api/Student/Get-Student-By-Id</div> <table><tr><td>Http Method</td><td>GET</td></tr><tr><td>Parameter 1</td><td>Long studentId</td></tr><tr><td>Return</td><td>&lt;Student&gt;</td></tr></table>		Http Method	GET	Parameter 1	Long studentId	Return	<Student>	Fetches the student Details with the given student id
Http Method	GET							
Parameter 1	Long studentId							
Return	<Student>							
<div>/api/Student/Get-All-Students</div> <table><tr><td>Http Method</td><td>GET</td></tr><tr><td>Parameter 1</td><td>-</td></tr><tr><td>Return</td><td>&lt;&lt;IEnumerable&lt;Student&gt;&gt;&gt;</td></tr></table>		Http Method	GET	Parameter 1	-	Return	<<IEnumerable<Student>>>	Fetches all the student Details
Http Method	GET							
Parameter 1	-							
Return	<<IEnumerable<Student>>>							
<div>/api/Student/Search-Student-By-Name</div> <table><tr><td>Http Method</td><td>GET</td></tr><tr><td>Parameter 1</td><td>-</td></tr><tr><td>Return</td><td>&lt;Student&gt;</td></tr></table>		Http Method	GET	Parameter 1	-	Return	<Student>	Fetches the student Details with the given student name
Http Method	GET							
Parameter 1	-							
Return	<Student>							

## 5.2 TeacherController

API Teacher Controller

URL Exposed		Purpose
/api/Teacher/Create-Teacher		Add new teacher Details
Http Method	Post	
Parameter 1	Teacher teacher	
Return	HttpResponse status code	
/api/Teacher/Delete-Teacher		Delete teacher with given teacher id.
Http Method	DELETE	
Parameter 1	Long teacherId	
Return	HttpResponse status code	

<b>/api/Teacher/Get-Teacher-By-Id</b>		Fetches the teacher Details with the given teacher id
Http Method	GET	
Parameter 1	Long teacherId	
Return	<Teacher>	
<b>/api/Teacher/Get-All-Teachers</b>		Fetches all the teacher Details
Http Method	GET	
Parameter 1	-	
Return	<<IEnumerable<Teacher>>>	
<b>/api/Teacher/Search-Teacher-By-Name</b>		Fetches the teacher Details with the given teacher name
Http Method	GET	
Parameter 1	-	
Return	<Teacher>	

## 6. TEMPLATE CODE STRUCTURE

### 6.1 Package: CollegeManagement

#### Resources

Names	Resource	Remarks	Status
Package Structure			
controller	Department Controller Student Controller Teacher Controller	Controller class to expose all rest-endpoints for auction related activities.	Partially implemented
Startup.cs	Startup CS file	Contain all Services settings and SQL server Configuration.	Already Implemented
Properties	launchSettings.json file	All URL Setting for API	Already Implemented
	appsettings.json	Contain connection string for database	Already Implemented

## 6.2 Package: CollegeManagement.BusinessLayer

### Resources

Names	Resource	Remarks	Status
Package Structure			
Interface	ITeacherService, IStudentService, IDepartmentService interface	Inside all these interface files contains all business validation logic functions.	Already Implemented
Service	TeacherService CS file StudentService CS file DepartmentService CS file	Using this all class we are calling the Repository method and use it in the program and on the controller.	Partially Implemented
Repository	ITeacherRepository TeacherRepository IStudentRepository StudentRepository IDepartmentRepository DepartmentRepository CS file and interface.	All these interfaces and class files contain all CRUD operation code for the database. Need to provide implementation for service related functionalities	Partially Implemented
ViewModels	TeacherViewModel, StudentViewModel, DepartmentViewModel	Contain all view Domain entities for show and bind data. All the business validations must be implemented.	Already Implemented

## 6.3 Package: CollegeManagement.DataLayer

### Resources

Names	Resource	Remarks	Status
Package Structure			
DataLayer	CollegeDbContext cs file	All database Connection and collection setting class	Already Implemented



## 6.4 Package: CollegeManagement.Entities

### Resources

Names	Resource	Remarks	Status
Package Structure			
Entities	Teacher, Student, Department CS file	All Entities/Domain attribute are used for pass the data in controller. Annotate this class with proper annotation to declare it as an entity class with <b>Id</b> as primary key.  Generate the <b>Id</b> using the <b>IDENTITY</b> strategy	Already Implemented

## 6.5 Package: CollegeManagement.Tests

### Resources

The CollegeManagement.Tests project contains all test case classes and functions for code evaluation. Don't edit or change anything inside this project.

## 7. EXECUTION STEPS TO FOLLOW

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1. All actions like build, compile, running application, running test cases will be through Command Terminal.
2. To open the command terminal the test takers need to go to the Application menu (Three horizontal lines at left top) Terminal → New Terminal.
3. On command prompt, cd into your project folder (**cd <Your-Project-folder>**).
4. To connect SQL server from terminal:  
(CollegeManagement /**sqlcmd -S localhost -U sa -P pass@word1**)
  - To create database from terminal -  
**1> Create Database CollegeManagementDb**  
**2> Go**

5. Steps to Apply Migration(Code first approach):
  - Press **Ctrl+C** to get back to command prompt
  - Run following command to apply migration-  
(CollegeManagement /**dotnet-ef database update**)
6. To check whether migrations are applied from terminal:  
(CollegeManagement /**sqlcmd -S localhost -U sa -P pass@word1**)  
  

**1> Use CollegeManagementDb**  
**2> Go**  
**1> Select \* From \_\_EFMigrationsHistory**  
**2> Go**
7. To build your project use command:  
(CollegeManagement /**dotnet build**)
8. To launch your application, Run the following command to run the application:  
(CollegeManagement/**dotnet run**)
9. This editor Auto Saves the code.
10. To test any Restful application, the last option on the left panel of IDE, you can find ThunderClient, which is the lightweight equivalent of POSTMAN.
11. To test web-based applications on a browser, use the internal browser in the workspace. Click on the second last option on the left panel of IDE, you can find Browser Preview, where you can launch the application.  
  
**Note: The application will not run in the local browser**
12. To run the test cases in CMD, Run the following command to test the application:  
(CollegeManagement.Tests/**dotnet test --logger "console;verbosity=detailed"**)  
(You can run this command multiple times to identify the test case status,and refactor code to make maximum test cases passed before final submission)

- 13. If you want to exit(logout) and continue the coding later anytime (using Save & Exit option on Assessment Landing Page) then you need to use CTRL+Shift+B - command compulsorily on code IDE. This will push or save the updated contents in the internal git/repository. Else the code will not be available in the next login.**
- 14. These are time bound assessments the timer would stop if you logout and while logging in back using the same credentials the timer would resume from the same time it was stopped from the previous logout.**
- 15. You need to use CTRL+Shift+B - command compulsorily on code IDE, before final submission as well. This will push or save the updated contents in the internal git/repository, and will be used to evaluate the code quality.**
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