

UNIVERSITY OF THE PUNJAB

BS (SE) Fall 2022 Morning

Web Engineering - Lab 10

Time Duration: 1.5 hr, Total Marks: 30

Lab Task: CRUD Operations and One-to-One Relationship in EF Core

Objective:

The objective of this lab task is to implement **CRUD operations** (Create, Read, Update, Delete) on entities in **EF Core** and establish a **one-to-one relationship** between two entities.

Covered Content:

- CRUD Operations: Create, Read, Update, Delete
- Relationships: One-to-One

Task 0: Setting Up the EF Core Environment (10 marks)

1. Create a new **.NET Core Console Application** project.
2. Install the following NuGet packages for EF Core:
 - **Microsoft.EntityFrameworkCore**
 - **Microsoft.EntityFrameworkCore.SqlServer**
 - **Microsoft.EntityFrameworkCore.Tools**
3. Create a **SchoolContext** class that inherits from DbContext and configure a connection string to your database.
4. Create two entities:
 - **Student** with properties Id, Name, and a navigation property Address.
 - **Address** with properties Id, Street, City, and a foreign key StudentId.
5. Create and apply a migration to generate the database schema.

Task 1: Implement CRUD Operations (15 marks)

1. **Create Operation:**
 - Insert a new Student along with an Address.
 - The Student object should be linked to the Address using the Address navigation property.
2. **Read Operation:**
 - Retrieve a Student by Id and display their Name and associated Address (Street, City).
3. **Update Operation:**
 - Update a Student's Name and Address.
4. **Delete Operation:**
 - Delete a Student and their associated Address.

Lab Task 2: Testing One-to-One Relationship and CRUD Operations (5 marks)

1. Insert multiple Student and Address records into the database.
2. Retrieve a Student and their related Address, ensuring that the **one-to-one relationship** is respected.
3. Update an existing Student and their Address, then verify the changes.
4. Delete a Student and ensure that the associated Address is also deleted (due to the foreign key constraint).

This lab task will help students learn how to set up and configure **one-to-one relationships** using **EF Core**. It also covers the basics of **CRUD operations** and working with **navigation properties** in EF Core.

Important Instructions Before You Start

1. **Read Each Task Carefully:** Understand all requirements before implementation.
 2. **Set Up Your Environment:** Ensure tools like Visual Studio, SQL Server, and .NET SDK are installed and configured.
 3. **Backup Regularly:** Save progress frequently to avoid data loss.
 4. **Test Frequently:** Validate functionality after each step to identify and fix issues early.
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