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Declaration

We confirm that we understand our coursework needs to be submitted online via My Second Teacher under the relevant module page before the deadline to be accepted and marked. We are fully aware that late submission will be treated as non-submission and a mark of zero will be awarded.

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1. ERD from case study

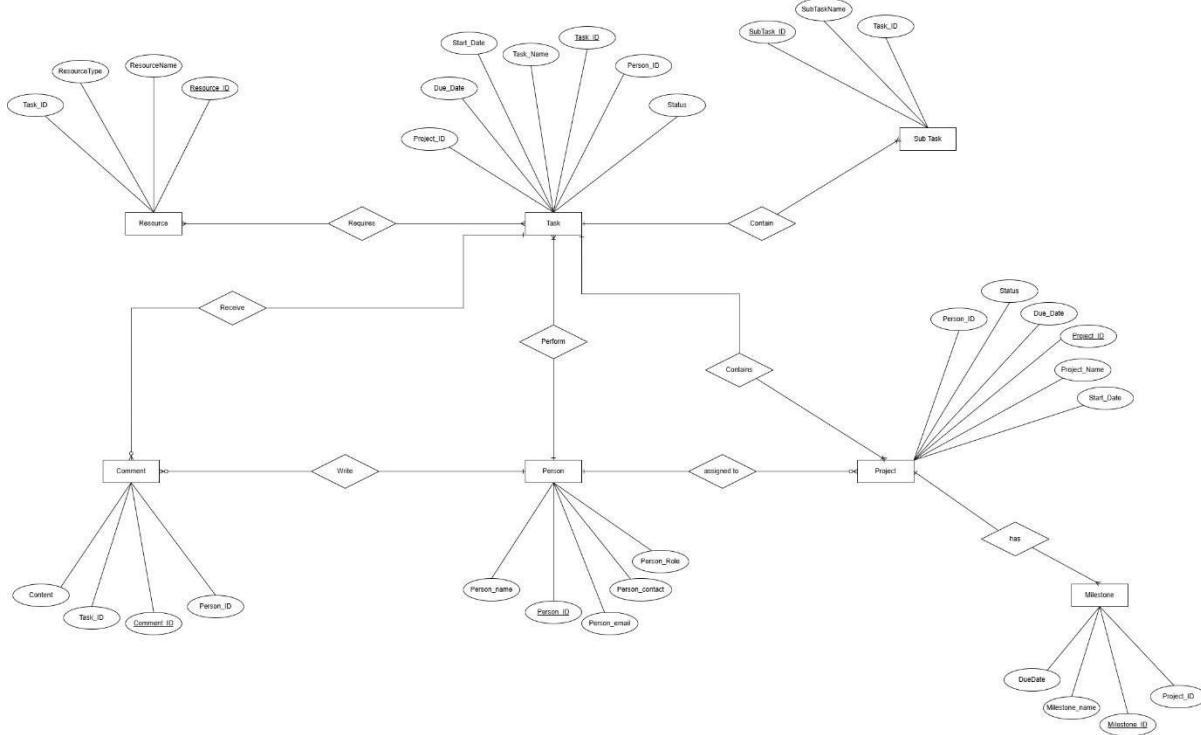


Figure 1: Final ERD

Entities:

1. Person
2. Task
3. Project
4. Comment
5. Milestone
6. Resource
7. Subtask

Relationship

a. Person and Project

- **Many-to-Many:** A person can be assigned to multiple projects, and each project can have multiple person assigned to it.
- **Optionality:** A person can optionally not work in project.

b. Person and Task

- **One-to-Many:** A person can perform multiple tasks, but each task is performed by one or more person's.

c. Person and Comment

- **One-to-Many:** A person can write multiple comments, but each comment is written by one person.
- **Optionality:** A person may or may not write comments.

d. Task and Comment

- **One-to-Many:** A task can receive multiple comments, but each comment is associated with one task.
- **Optionality:** A task can exist without comments, a comment must belong to one task.

e. Task and Sub-task

- **One-to-Many:** A task contains multiple subtasks, but each subtask belongs to one task.

f. Task and Resource

- **Many-to-many:** A task requires multiple resources, but each resource is required by one task.

g. Project and Task

- **One-to-Many:** A project contains multiple tasks, but each task belongs to one project.

h. Project and Milestone

- **One-to-Many:** A project has multiple milestones, but each milestone is associated with one project.

2. Normalization

Normalization in database is a process to organize data to reduce redundancy and improve data integrity.

2.1 UNF (writing down all attributes)

Data is unorganized and may have repeating groups, meaning a column can contain multiple values. There's no structure to avoid redundancy.

Person: Person_id, Person_name Person_email, Person_contact,
{project_id, project_name, project_start_date, project_due_date, project_status,
{task_id, task_name, task_start_date, task_due_date, task_status}})

U-01	Sam Smith	smith@gmail.com	977 9859697989	P-01	Enrolment System	1/1/2024	10/23/2024	On going	T-01	Student Registration	1/1/2024	2/20/2024	Completed
------	-----------	-----------------	----------------	------	------------------	----------	------------	----------	------	----------------------	----------	-----------	-----------

Figure 2: UNF Table

2.2 First Normal Form 1NF (Removing repeating group)

Data is organized into a table where each column has a single value and each row is unique. Repeating groups are moved.

Person: Person_id, Person_name Person_email, Person_contact

U-01	Sam Smith	smith@gmail.com	977 9859697989
------	-----------	-----------------	----------------

Figure 3: First Normalization Person table

Project: Person_id, project_id, project_name, project_start_date, project_due_date, project_status, {task_id, task_name, task_start_date, task_due_date, task_status}

U-01	P-01	Enrolment System	1/1/2024	10/23/2024	On going	T-01	Student Registration	1/1/2024	2/20/2024	Completed
	P-01	Enrolment System	1/1/2024	10/23/2024	On going	T-02	Student Counselling Form	1/5/2024	6/15/2024	On going
	P-02	Attendance System	3/1/2024	12/12/2024	On going	T-03	Biometric Registration	3/10/2024	3/20/2024	Completed

Figure 4: First Normalization Project table

2.3 Second Normal Form 2NF (Removing partial and full functional dependency)

Data is in 1NF, and all non-key columns are fully dependent on the entire primary key, not just part of it (no partial dependencies)

For Project Table:

Project: Person_id, project_id, project_name, project_start_date, project_due_date, project_status, {task_id, task_name, task_start_date, task_due_date, task_status}

project_id, project_name, project_start_date, project_due_date, project_status

Task_id, task_name, task_start_date, task_due_date, task_status

Person_id, **project_id**, Person_id, project_id, role

Project_id, **Task_id**, Project_id, Task_id, working_shift, milestones

Person_id, **Project_id**, **task_id**, Person_id, project_id, task_id, status, resource

Final Table:

Person: Person_id, Person_name, Person_email, Person_contact

U-01	Sam Smith	smith@gmail.com	977 9859697989
------	-----------	-----------------	----------------

Figure 5: Second Normalization of Person table

Project: project_id, project_name, project_start_date, project_due_date, project_status

P-01	Enrolment System	1/1/2024	10/23/2024	On going
P-02	Attendance System	3/1/2024	12/12/2024	On going

Figure 6: First Normalization of Project table

Task: task_id, task_name, task_start_date, task_due_date, task_status,

T-01	Student Registration	1/1/2024	2/20/2024	Completed
T-02	Student Counselling Form	1/5/2024	6/15/2024	On going
T-03	Biometric Registration	3/10/2024	3/20/2024	Completed

Figure 6: First Normalization Task table

Person_role: Person_id, project_id, role

U-01	P-01	Manager
------	------	---------

Figure 7: First Normalization Person_role table

Project_milestones: Project_id, task_id, milestones, resource

P-01	T-01	Achieved design	Figma
------	------	-----------------	-------

Figure 8: First Normalization project_milestone table

Person_tasks: Person_id, project_id, task_id, status, shift

U-01	P-01	T-01	on-going	Day
------	------	------	----------	-----

Figure 9: First Normalization Person_task table

3NF (removing transitive dependency)

Data is in 2NF, and there are no transitive dependencies. Non-key attributes depend only on the primary key, not on other non-key attributes.

For Person table

Person: Person_id, Person_name, Person_email, Person_contact,
grade_id, grade_name, salary

Person_id, grade_id, salary

For Person_task Table

Person_tasks: Person_id, project_id, task_id, status, shift_id, shift_name, hours

Person_id, project_id, task_id, shift_id, shift_name, hours shift

_id shift_name, hours

Final table:

Person: Person_id, Person_name, Person_email, Person_contact, grade_id

U-01	Sam Smith	smith@gmai.com	977 9859697989	G-01
------	-----------	----------------	-------------------	------

Figure 10: Final person table

Grade: grade_id, grade_name, salary

G-01	Developer	45,000
------	-----------	--------

Figure 11: Final grade table

Project: project_id, project_name, project_start_date, project_due_date, project_status

P-01	Enrolment System	1/1/2024	10/23/2024	On going
P-02	Attendance System	3/1/2024	12/12/2024	On going

Figure 12: Final project table

Task: task_id, task_name, task_start_date, task_due_date, task_status,

T-01	Student Registration	1/1/2024	2/20/2024	Completed
T-02	Student Counselling Form	1/5/2024	6/15/2024	On going
T-03	Biometric Registration	3/10/2024	3/20/2024	Completed

Figure 13: Final task table

Person_role: Person_id, project_id, role

U-01	P-01	Manager
------	------	---------

Figure 14: Final person_role table

Project_milestones: project_id, task_id, milestones

P-01	T-01	Achieved design
------	------	-----------------

Figure 15: Final project milestones

Figure 14

Person_tasks: Person_id, project_id, task_id, status, shift_id

U-01	P-01	T-01	on-going	S-01
------	------	------	----------	------

Figure 16: Final person tasks

Shift: shift_id, shift_name, hours

S-01	Day	10hrs
------	-----	-------

Figure 17: Final shift table

3. Creating Database and Tables with Description

```

SQL*Plus: Release 11.2.0.2.0 Production on Fri Jan 3 09:12:52 2025
Copyright (c) 1982, 2014, Oracle. All rights reserved.

Enter user-name: sys as sysdba
Enter password:

Connected to:
Oracle Database 11g Express Edition Release 11.2.0.2.0 - 64bit Production

SQL> Create user sujan identified by parajuli;
Create user sujan identified by parajuli
*
ERROR at line 1:
ORA-01920: user name 'SUJAN' conflicts with another user or role name

SQL> Create user sujanparajuli identified by parajuli;
User created.

SQL> Grant all privileges to sujanparajuli;
Grant succeeded.

SQL> conn sujanparajuli
Enter password:
Connected.

```

Figure 18: Creating User

Creating tables:

- Person

```

SQL> create table person (
  2      personid int primary key,
  3      name varchar(50),
  4      email varchar(50),
  5      contact number(10),
  6      gradeid int
  7  );

```

Table created.

Figure 19: Creating table Person

```
SQL> desc person;
Name                                Null?    Type
-----
PERSONID                           NOT NULL NUMBER(38)
NAME                               VARCHAR2(50)
EMAIL                             VARCHAR2(50)
CONTACT                           NUMBER(10)
GRADEID                           NUMBER(38)
```

Figure 20: Describe table Person

- Grade

```
SQL> create table grade (
  2      gradeid int primary key,
  3      name varchar(30),
  4      salary int
  5  );
Table created.
```

Figure 21: Creating table Grade

```
SQL> desc grade;
Name                                Null?    Type
-----
GRADEID                           NOT NULL NUMBER(38)
NAME                               VARCHAR2(30)
SALARY                            NUMBER(38)
```

Figure 22: Describe table Grade

- Project

```
SQL> create table project (
  2      projectid int primary key,
  3      name varchar(50),
  4      startDate date,
  5      dueDate date,
  6      status varchar(15)
  7  );  
  
Table created.
```

Figure 23: Creating table Project

```
SQL> desc project;
Name          Null?    Type
-----  
PROJECTID      NOT NULL NUMBER(38)
NAME           VARCHAR2(50)
STARTDATE      DATE
DUEDATE        DATE
STATUS         VARCHAR2(15)
```

Figure 24: Describe table Project

- Task

```
SQL> create table task (
  2      taskid int primary key,
  3      name varchar(50),
  4      startDate date,
  5      dueDate date,
  6      status varchar(10)
  7  );
Table created.
```

Figure 25: Creating table Task

Name	Null?	Type
TASKID	NOT NULL	NUMBER(38)
NAME		VARCHAR2(50)
STARTDATE		DATE
DUEDATE		DATE
STATUS		VARCHAR2(10)

Figure 26: Describe table Task

- Person_role

```
SQL> create table person_role (
  2      personid int,
  3      projectid int,
  4      role varchar(50),
  5      primary key (personid, projectid),
  6      foreign key (personid) references person(personid),
  7      foreign key (projectid) references project(projectid)
  8  );
Table created.
```

Figure 27: Creating table Person_role

Name	Null?	Type
PERSONID	NOT NULL	NUMBER(38)
PROJECTID	NOT NULL	NUMBER(38)
ROLE		VARCHAR2(50)

Figure 28: Describe table Person_role

ProjectMilestone

```
SQL> create table ProjectMilestone (
  2      projectid int,
  3      taskid int,
  4      milestone varchar(50),
  5      primary key (projectid, taskid),
  6      foreign key (projectid) references project(projectid),
  7      foreign key (taskid) references task(taskid)
  8  );
Table created.
```

Figure 29: Creating table Projectmilestone

```
SQL> desc projectmilestone;
Name Null? Type
-----
PROJECTID NOT NULL NUMBER(38)
TASKID NOT NULL NUMBER(38)
MILESTONE VARCHAR2(50)
RESOURCES VARCHAR2(100)
```

Figure 30: Describe table Projectmilestone

- Shift

```
SQL> create table shift (
  2      shiftid int primary key,
  3      name varchar(25),
  4      hours varchar(20)
  5  );
Table created.
```

Figure 31: Creating table Shift

```
SQL> desc shift;
Name Null? Type
-----
SHIFTID NOT NULL NUMBER(38)
NAME VARCHAR2(25)
HOURS VARCHAR2(20)
```

Figure 32: Describe table Shift

- UserTask

```
SQL> create table UserTask (
  2      personid int,
  3      projectid int,
  4      taskid int,
  5      shiftid int,
  6      primary key (personid, projectid, taskid, shiftid),
  7      foreign key (personid) references person(personid),
  8      foreign key (projectid) references project(projectid),
  9      foreign key (taskid) references task(taskid),
 10      foreign key (shiftid) references shift(shiftid)
 11  );  
  
Table created.
```

Figure 33: Creating table Usertask

```
SQL> desc usertask;
Name                           Null?    Type
-----  
----  
PERSONID                      NOT NULL NUMBER(38)  
PROJECTID                     NOT NULL NUMBER(38)  
TASKID                        NOT NULL NUMBER(38)  
SHIFTID                       NOT NULL NUMBER(38)
```

Figure 34: Describe table Usertask

Altering table Person to add foreign key grade

```
SQL> ALTER TABLE person
  2  ADD CONSTRAINT gradeid
  3  FOREIGN KEY (gradeid)
  4  REFERENCES Grade(gradeid);

Table altered.
```

Figure 35: Alter table person to add foreign key grade

4. Final Erd

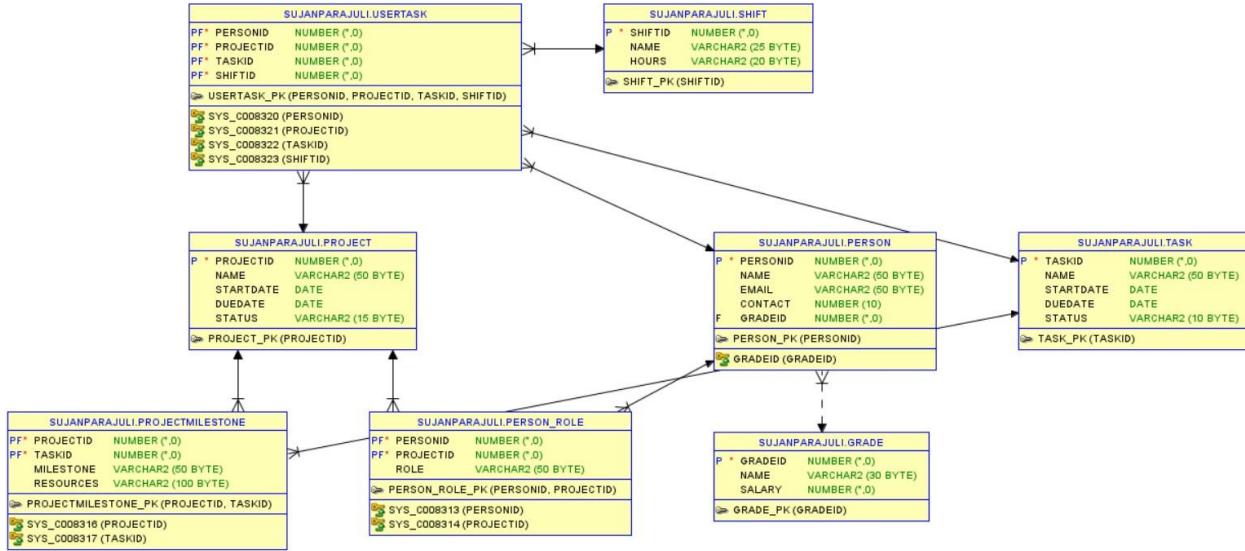


Figure 26: Final ERD

5. Inserting and Selecting Data

- Grade

```
SQL> INSERT INTO grade (gradeid, name, salary) VALUES (1, 'Junior', 30000);
1 row created.

SQL> INSERT INTO grade (gradeid, name, salary) VALUES (2, 'Mid-Level', 50000);
1 row created.

SQL> INSERT INTO grade (gradeid, name, salary) VALUES (3, 'Senior', 80000);
1 row created.
```

Figure 27: Inserting value in table Grade

```
SQL> select * from grade;

GRADEID NAME                               SALARY
----- -----
 1 Junior                                30000
 2 Mid-Level                            50000
 3 Senior                                80000
```

Figure 28: Select table Grade

6. Insert Data into Web Form

Person

```
SQL> INSERT INTO person (personid, name, email, contact, gradeid)
  2  VALUES (1, 'Alice', 'alice@gmail.com', '9876543210', 1);

1 row created.

SQL> INSERT INTO person (personid, name, email, contact, gradeid)
  2  VALUES (2, 'Bob', 'bob@gmail.com', '8765432109', 2);

1 row created.

SQL> INSERT INTO person (personid, name, email, contact, gradeid)
  2  VALUES (3, 'Charlie', 'charlie@gmail.com', '7654321098', 3);

1 row created.
```

Figure 29: Inserting value in table Person

```
SQL> select * from person;

  PERSONID NAME
  -----
  EMAIL                               CONTACT      GRADEID
  -----
    1 Alice                            9876543210      1
  alice@gmail.com
    2 Bob                             8765432109      2
  bob@gmail.com
    3 Charlie                          7654321098      3
  charlie@gmail.com
```

Figure 30: Select table Person

Project

```

SQL> INSERT INTO project (projectid, name, startDate, dueDate, status)
  2  VALUES (1, 'Project Alpha', TO_DATE('2024-01-01', 'YYYY-MM-DD'), TO_DATE('2024-12-31', 'YYYY
Y-MM-DD'), 'Active');

1 row created.

SQL> INSERT INTO project (projectid, name, startDate, dueDate, status)
  2  VALUES (2, 'Project Beta', TO_DATE('2024-02-01', 'YYYY-MM-DD'), TO_DATE('2024-08-31', 'YYYY
-MM-DD'), 'Completed');

1 row created.

SQL> INSERT INTO project (projectid, name, startDate, dueDate, status)
  2  VALUES (3, 'Project Gamma', TO_DATE('2024-03-01', 'YYYY-MM-DD'), TO_DATE('2024-09-30', 'YYYY
Y-MM-DD'), 'Pending');

1 row created.

```

Figure 31: Inserting value in table Project

PROJECTID	NAME	STARTDATE
1	Project Alpha	01-JAN-24
2	Project Beta	01-FEB-24
3	Project Gamma	01-MAR-24

Figure 32: Select table Project

Task

```

SQL> INSERT INTO task (taskid, name, startDate, dueDate, status)
  2  VALUES (1, 'Task A', TO_DATE('2024-01-15', 'YYYY-MM-DD'), TO_DATE('2024-02-15', 'YYYY-MM-DD')
  ') , 'Completed');

1 row created.

SQL> INSERT INTO task (taskid, name, startDate, dueDate, status)
  2  VALUES (2, 'Task B', TO_DATE('2024-02-01', 'YYYY-MM-DD'), TO_DATE('2024-03-01', 'YYYY-MM-DD'
  ') , 'Progress');

1 row created.

SQL> INSERT INTO task (taskid, name, startDate, dueDate, status)
  2  VALUES (3, 'Task C', TO_DATE('2024-03-15', 'YYYY-MM-DD'), TO_DATE('2024-04-15', 'YYYY-MM-DD'
  ') , 'Pending');

1 row created.

```

Figure 33: Inserting value in table Task

SQL> select * from Task;			
TASKID	NAME	STARTDATE	
-----	-----	-----	-----
DUEDATE	STATUS		
-----	-----	-----	-----
1	Task A	15-JAN-24	
15-FEB-24	Completed		
3	Task C	15-MAR-24	
15-APR-24	Pending		
2	Task B	01-FEB-24	
01-MAR-24	Progress		

Figure 34: Select table Task

- Person_Role

```
SQL> INSERT INTO person_role (personid, projectid, role) VALUES (1, 1, 'Project Manager');
1 row created.

SQL> INSERT INTO person_role (personid, projectid, role) VALUES (2, 2, 'Developer');
1 row created.

SQL> INSERT INTO person_role (personid, projectid, role) VALUES (3, 3, 'Tester');
1 row created.
```

Figure 35: Inserting value in table Person_role

```
SQL> select * from person_role;

PERSONID PROJECTID ROLE
-----
1          1 Project Manager
2          2 Developer
3          3 Tester
```

Figure 36: Select table Person_role

- ProjectMilestone

```
SQL> INSERT INTO ProjectMilestone (projectid, taskid, milestone) VALUES (1, 1, 'Design Phase Completed');

1 row created.

SQL> INSERT INTO ProjectMilestone (projectid, taskid, milestone) VALUES (2, 2, 'Development Phase Completed');

1 row created.

SQL> INSERT INTO ProjectMilestone (projectid, taskid, milestone) VALUES (3, 3, 'Testing Phase Started');

1 row created.
```

Figure 37: Inserting value in table Projectmilestone

```
SQL> select * from projectmilestone;

PROJECTID      TASKID MILESTONE
----- -----
RESOURCES
-----
1          1 Design Phase Completed
2          2 Development Phase Completed
3          3 Testing Phase Started
```

Figure 38: Select table Projectmilestone

- Shift

```
SQL> INSERT INTO shift (shiftid, name, hours) VALUES (1, 'Morning', '08:00-16:00');
1 row created.

SQL> INSERT INTO shift (shiftid, name, hours) VALUES (2, 'Evening', '16:00-00:00');
1 row created.

SQL> INSERT INTO shift (shiftid, name, hours) VALUES (3, 'Night', '00:00-08:00');
1 row created.
```

Figure 39: Inserting value in table Shift

SQL> select * from shift;		
SHIFTID	NAME	HOURS
1	Morning	08:00-16:00
2	Evening	16:00-00:00
3	Night	00:00-08:00

Figure 40: Select table Shift

- UserTask

```
SQL> INSERT INTO UserTask (personid, projectid, taskid, shiftid) VALUES (1, 1, 1, 1);
1 row created.

SQL> INSERT INTO UserTask (personid, projectid, taskid, shiftid) VALUES (2, 2, 2, 2);
1 row created.

SQL> INSERT INTO UserTask (personid, projectid, taskid, shiftid) VALUES (3, 3, 3, 3);
1 row created.
```

Figure 41: Inserting value in table UseTtask

SQL> select * from UserTask;			
PERSONID	PROJECTID	TASKID	SHIFTID
1	1	1	1
2	2	2	2
3	3	3	3

Figure 42: Select table UserTask

7. Implementation of Web Form

7.1 Simple web Form

1) Navbar

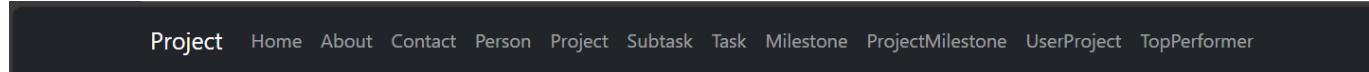


Figure 36: Navbar

2) Person

A screenshot of a web application showing a person management form and a table of existing data.

Person Management

Person ID:	5
Person Name:	IShowSpeed
Person Email:	parajulisujan67@gmail.com
Person Contact:	9815107036
Grade ID:	1

Submit

ID	Name	Email	Contact	Grade
1	Alice	alice@gmail.com	9876543210	1
2	Bob	bob@gmail.com	8765432109	2
3	Charlie	charlie@gmail.com	7654321098	3
4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3

Figure 37: Person

3) Project

The screenshot shows a web-based project management application. At the top, there is a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. Below the navigation bar, the main title is "Project Management".

The form for creating a new project has the following fields:

- Project ID: 4
- Project Name: Lunch Making
- Start Date: 03/18/2025
- Due Date: 06/26/2025
- Status: Active

A blue "Submit" button is located below the form.

Below the form is a table displaying existing projects:

ID	Name	Start Date	Due Date	Status
1	Project Alpha	1/1/2024	12/31/2024	Active
2	Project Beta	2/1/2024	8/31/2024	Completed
3	Project Gamma	3/1/2024	9/30/2024	Pending

Figure 38: Project

4) Subtask

The screenshot shows a web application titled "Subtask Management". The URL is https://localhost:44370/Subtask. The page has a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. The main content area contains a form for creating or editing a subtask. The form fields are: Subtask ID (2), Task ID (1), Subtask Name (Subtask2 for Task A), Start Date (03/18/2025), Due Date (07/06/2025), and Status (To Do). Below the form is a table showing existing subtasks:

	ID	Task ID	Name	Start Date	End Date	Status
Edit Delete	1	1	Subtask 1 for Task A	1/15/2024	2/15/2024	Pending

At the bottom left, there is a copyright notice: © 2025 - My ASP.NET Application.

Figure 39: Subtask

5) Milestone

The screenshot shows a web application interface for managing project milestones. At the top, there is a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. Below the navigation bar, the title "Project Milestones" is displayed. A dropdown menu titled "Select Project" shows "Project Alpha" as the selected option, with a "Search" button next to it. A summary box contains the following information: Project ID: 1, Project Name: Project Alpha, Start Date: 1/1/2024, Due Date: 12/31/2024, and Status: Active. Below this, a section titled "Milestone Details" lists a single milestone: "Design Phase Completed". This entry has columns for "Milestone" and "Resources". Under "Milestone", there is a link to "Edit" and a link to "Delete".

Figure 40: Milestone

6) Project Milestone

The screenshot shows a "Milestone Management" page. At the top, there is a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. The main title is "Milestone Management". Below the title, there is a form with four input fields: "Project ID" (value: 4), "Milestone Name" (value: Deployment), "Resource" (value: Internet), and "Task ID" (value: 2). A blue "Submit" button is located below the form. Below the form, there is a table titled "Milestone Management" with the following data:

Project ID	Task ID	Milestone	Resources
1	1	Design Phase Completed	Edit Delete
2	2	Development Phase Completed	Edit Delete
3	3	Testing Phase Started	Edit Delete

At the bottom of the page, there is a copyright notice: "© 2025 - My ASP.NET Application".

Figure 41: Project Milestone

7) UserProject

The screenshot shows a web browser window with the URL <https://localhost:44370/UserProject>. The page title is "User Project Details". On the left, there's a sidebar with the heading "User Projects". In the center, there's a "Select User" dropdown menu with the following options:

- Alice (selected)
- Bob
- Charlie
- Sujan Parajuli

Below the dropdown is a table with the following data:

Project Name	Start Date	End Date	Status	Role
Project Alpha	January 1, 2024	December 31, 2024	Active	Project Manager

At the bottom of the page, there's a copyright notice: © 2025 - My ASP.NET Application.

Figure 42: User Project

8) Dashboard

Dashboard Overview

Total Users

10

Total Projects

5

Total Tasks

8

Total Milestones

4

9) Top Performer

The screenshot shows a web application interface for managing projects and tasks. At the top, there is a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. Below the navigation bar, the main title is "Top Performers". A dropdown menu labeled "Select Project" is open, showing "Project Alpha" as the selected option. To the right of the dropdown is a "Search" button. The next section is titled "Top 3 Performers" and contains a table with one row. The table has two columns: "User Name" and "Completed Tasks". The user listed is "Alice", who has completed "1" task. There is a blue "Select" button to the right of the table. At the bottom of the page, a copyright notice reads "© 2025 - My ASP.NET Application".

User Name	Completed Tasks
Alice	1

8. Testing

8.1 Test Cases

7.1.1 Add User Page

Project Home About Contact Person Project Subtask Task Milestone ProjectMilestone UserProject TopPerformer

Person Management

	ID	Name	Email	Contact	Grade
Edit	1	Alice	alice@gmail.com	9876543210	1
Edit	2	Bob	bob@gmail.com	8765432109	2
Edit	3	Charlie	charlie@gmail.com	7654321098	3
Edit	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3
Edit	5	IShowSpeed	parajulisujan67@gmail.com	9815107036	1

Figure 43: Add User Page

7.1.2 Update User

Project Home About Contact Person Project Subtask Task Milestone ProjectMilestone UserProject TopPerformer

Person Management

	ID	Name	Email	Contact	Grade
Edit	1	Alice	alice@gmail.com	9876543210	1
Edit	2	Bob	bob@gmail.com	8765432109	2
Edit	3	Charlie	charlie@gmail.com	7654321098	3
Edit	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3
Edit	5	IShowSpeed	parajulisujan67@gmail.com	9815107036	1

Figure 44: Update User

Before

	<u>ID</u>	<u>Name</u>	<u>Email</u>	<u>Contact</u>	<u>Grade</u>
Edit Del	1	Alice	alice@gmail.com	9876543210	1
Edit Del	2	Bob	bob@gmail.com	8765432109	2
Edit Del	3	Charlie	charlie@gmail.com	7654321098	3
Edit Del	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3
Edit Del	5	IShowSpeed	parajulisujan67@gmail.com	9815107036	1

Figure 45: before update user

After

	<u>ID</u>	<u>Name</u>	<u>Email</u>	<u>Contact</u>	<u>Grade</u>
Edit Del	1	Alice	alice@gmail.com	9876543210	1
Edit Del	2	Bob	bob@gmail.com	8765432109	2
Edit Del	3	Charlie	charlie@gmail.com	7654321098	3
Edit Del	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3
Edit Del	5	Aashish	Ashish@example.com	9815107036	1

Figure 46: After update user

Before

	<u>ID</u>	<u>Name</u>	<u>Email</u>	<u>Contact</u>	<u>Grade</u>
Edit Del	1	Alice	alice@gmail.com	9876543210	1
Edit Del	2	Bob	bob@gmail.com	8765432109	2
Edit Del	3	Charlie	charlie@gmail.com	7654321098	3
Edit Del	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3
Edit Del	5	Aashish	Ashish@example.com	9815107036	1

After

	<u>ID</u>	<u>Name</u>	<u>Email</u>	<u>Contact</u>	<u>Grade</u>
Edit Del	1	Alice	alice@gmail.com	9876543210	1
Edit Del	2	Bob	bob@gmail.com	8765432109	2
Edit Del	3	Charlie	charlie@gmail.com	7654321098	3
Edit Del	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3

7.1.2 Test Project

Before

ID	Name	Start Date	Due Date	Status
1	Project Alpha	1/1/2024	12/31/2024	Active
2	Project Beta	2/1/2024	8/31/2024	Completed
3	Project Gamma	3/1/2024	9/30/2024	Pending

Figure 47: Before add project

After

ID	Name	Start Date	Due Date	Status
1	Project Alpha	1/1/2024	12/31/2024	Active
2	Project Beta	2/1/2024	8/31/2024	Completed
3	Project Gamma	3/1/2024	9/30/2024	Pending
4	Lunch Making	3/18/2025	6/26/2025	Active

Figure 48: After add project

Updating

Before

	ID	Name	Start Date	Due Date	Status
Edit Delete	1	Project Alpha	1/1/2024	12/31/2024	Active
Edit Delete	2	Project Beta	2/1/2024	8/31/2024	Completed
Edit Delete	3	Project Gamma	3/1/2024	9/30/2024	Pending
Edit Delete	4	Lunch Making	3/18/2025	6/26/2025	Active

Figure 49: Before updating project

After

	ID	Name	Start Date	Due Date	Status
Edit Delete	1	Project Alpha	1/1/2024	12/31/2024	Active
Edit Delete	2	Project Beta	2/1/2024	8/31/2024	Completed
Edit Delete	3	Project Gamma	3/1/2024	9/30/2024	Pending
Edit Delete	4	Tiffin Making	3/18/2025	6/26/2025	Active

Figure 50: After updating project

Delete

Before

	ID	Name	Start Date	Due Date	Status
Edit Delete	1	Project Alpha	1/1/2024	12/31/2024	Active
Edit Delete	2	Project Beta	2/1/2024	8/31/2024	Completed
Edit Delete	3	Project Gamma	3/1/2024	9/30/2024	Pending
Edit Delete	4	Tiffin Making	3/18/2025	6/26/2025	Active

After

	ID	Name	Start Date	Due Date	Status
Edit Delete	1	Project Alpha	1/1/2024	12/31/2024	Active
Edit Delete	2	Project Beta	2/1/2024	8/31/2024	Completed
Edit Delete	3	Project Gamma	3/1/2024	9/30/2024	Pending

7.1.3 Task

Before

The screenshot shows a web browser window for 'Task - My ASP.NET Application' at <https://localhost:44370/Task>. The page has a light blue header and body. At the top, there is a form with fields for Task ID (4), Task Name (Task D), Start Date (03/18/2025), Due Date (07/12/2025), Status (To Do), and Project ID (3). A 'Submit' button is located below the form. Below the form is a table listing three tasks:

ID	Name	Start Date	Due Date	Status	Project ID
1	Task A	1/15/2024	2/15/2024	Completed	
3	Task C	3/15/2024	4/15/2024	Pending	
2	Task B	2/1/2024	3/1/2024	Progress	

At the bottom of the page, a copyright notice reads © 2025 - My ASP.NET Application.

Figure 51: Before adding task

The screenshot shows a web browser window titled "Task - My ASP.NET Application" at the URL <https://localhost:44370/Task>. The page contains a form for adding a task and a table displaying existing tasks.

Form Fields:

- Task Name: Enter Name
- Start Date: mm/dd/yyyy
- Due Date: mm/dd/yyyy
- Status: Select Status
- Project ID: Enter Project ID
- Submit button

Table Data:

	ID	Name	Start Date	Due Date	Status	Project ID
Edit Delete	1	Task A	1/15/2024	2/15/2024	Completed	
Edit Delete	3	Task C	3/15/2024	4/15/2024	Pending	
Edit Delete	2	Task B	2/1/2024	3/1/2024	Progress	
Edit Delete	4	Task D	3/18/2025	7/12/2025	To Do	3

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Figure 52: After adding task

Update

Before

The screenshot shows a web browser window titled "Task - My ASP.NET Application" at the URL <https://localhost:44370/Task>. The page contains a form for adding a task and a table displaying existing tasks.

Form Fields:

- Task Name: Enter Name
- Start Date: mm/dd/yyyy
- Due Date: mm/dd/yyyy
- Status: Select Status
- Project ID: Enter Project ID
- Submit button

Table Data:

	ID	Name	Start Date	Due Date	Status	Project ID
Edit Delete	1	Task A	1/15/2024	2/15/2024	Completed	
Edit Delete	3	Task C	3/15/2024	4/15/2024	Pending	
Edit Delete	2	Task B	2/1/2024	3/1/2024	Progress	
Edit Delete	4	Task D	3/18/2025	7/12/2025	To Do	3

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Figure 53: Before update task

After

The screenshot shows a web application interface for managing tasks. At the top, there is a navigation bar with back, forward, and search icons, followed by the URL <https://localhost:44370/Task>. Below the navigation is a form for updating a task:

Task Name:	<input type="text" value="Enter Name"/>
Start Date:	<input type="text" value="mm/dd/yyyy"/> <input type="button" value="..."/>
Due Date:	<input type="text" value="mm/dd/yyyy"/> <input type="button" value="..."/>
Status:	<input type="button" value="Select Status"/>
Project ID:	<input type="text" value="Enter Project ID"/>

Below the form is a blue "Submit" button. Underneath the form is a table displaying a list of tasks:

ID	Name	Start Date	Due Date	Status	Project ID
1	Task A	1/15/2024	2/15/2024	Completed	
3	Task C	3/15/2024	4/15/2024	Pending	
2	Task B	2/1/2024	3/1/2024	Progress	
4	Task E	3/18/2025	7/12/2025	To Do	3

At the bottom of the page, there is a copyright notice: © 2025 - My ASP.NET Application.

Figure 54: After update task

Deleting task

Before

The screenshot shows a web application interface for managing tasks. At the top, there is a navigation bar with a back arrow, a refresh icon, and a URL field containing <https://localhost:44370/Task>. Below the navigation bar is a form for creating a new task, featuring fields for Task Name (with placeholder "Enter Name"), Start Date (with placeholder "mm/dd/yyyy"), Due Date (with placeholder "mm/dd/yyyy"), Status (a dropdown menu with placeholder "Select Status"), and Project ID (with placeholder "Enter Project ID"). A blue "Submit" button is located at the bottom right of the form. Below the form is a table displaying a list of tasks:

ID	Name	Start Date	Due Date	Status	Project ID
1	Task A	1/15/2024	2/15/2024	Completed	
3	Task C	3/15/2024	4/15/2024	Pending	
2	Task B	2/1/2024	3/1/2024	Progress	
4	Task E	3/18/2025	7/12/2025	To Do	3

At the bottom of the page, there is a copyright notice: © 2025 - My ASP.NET Application.

Figure 55: Before deleting task

After

The screenshot shows a web browser window titled "Task - My ASP.NET Application" at the URL <https://localhost:44370/Task>. The page contains a form for creating a new task and a table displaying existing tasks.

Task Creation Form:

Task ID:	<input type="text" value="Enter ID"/>
Task Name:	<input type="text" value="Enter Name"/>
Start Date:	<input type="text" value="mm/dd/yyyy"/> Calendar icon
Due Date:	<input type="text" value="mm/dd/yyyy"/> Calendar icon
Status:	<select>Select Status</select>
Project ID:	<input type="text" value="Enter Project ID"/>

Submit

Task Table:

	ID	Name	Start Date	Due Date	Status	Project ID
Edit Delete	1	Task A	1/15/2024	2/15/2024	Completed	
Edit Delete	3	Task C	3/15/2024	4/15/2024	Pending	
Edit Delete	2	Task B	2/1/2024	3/1/2024	Progress	

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Figure 56: After deleting task

7.1.4 Subtask

Before

The screenshot shows a web browser window for 'Subtask - My ASP.NET Application' at <https://localhost:44370/Subtask>. The page title is 'Subtask Management'. The main content area contains a form with fields for Subtask ID (2), Task ID (1), Subtask Name (Subtask2 for Task A), Start Date (03/18/2025), Due Date (07/06/2025), and Status (To Do). Below the form is a table showing one existing subtask:

ID	Task ID	Name	Start Date	End Date	Status
1	1	Subtask 1 for Task A	1/15/2024	2/15/2024	Pending

At the bottom left, there is a copyright notice: © 2025 - My ASP.NET Application.

Figure 57: Before adding subtask

The screenshot shows a web browser displaying a Subtask Management page. The URL is https://localhost:44370/Subtask. The page has a header "Subtask Management". Below it is a form with fields: Subtask ID (text input), Task ID (text input), Subtask Name (text input), Start Date (date input), Due Date (date input), and Status (dropdown). A "Submit" button is at the bottom. Below the form is a table listing subtasks:

	ID	Task ID	Name	Start Date	End Date	Status
Edit	1	1	Subtask 1 for Task A	1/15/2024	2/15/2024	Pending
Edit	2	1	Subtask2 for Task A	3/18/2025	7/6/2025	To Do

At the bottom left is a copyright notice: © 2025 - My ASP.NET Application.

Figure 58: After adding subtask

Update

Before

The screenshot shows a Subtask Management page with two subtasks listed in a table:

	ID	Task ID	Name	Start Date	End Date	Status
Edit	1	1	Subtask 1 for Task A	1/15/2024	2/15/2024	Pending
Edit	2	1	Subtask2 for Task A	3/18/2025	7/6/2025	To Do

At the bottom left is a copyright notice: © 2025 - My ASP.NET Application.

Figure 59: Before updating subtask

After

The screenshot shows a web application interface. At the top, there is a status dropdown labeled "Status:" with the placeholder "Select Status" and a "Submit" button. Below this is a table with the following data:

ID	Task ID	Name	Start Date	End Date	Status
1	1	Subtask 1 for Task A	1/15/2024	2/15/2024	Pending
2	1	Subtask3 for Task B	3/18/2025	7/6/2025	To Do

Each row contains two buttons: "Edit" and "Delete". At the bottom of the page, there is a copyright notice: "© 2025 - My ASP.NET Application".

Figure 60: After updating subtask

Delete

The screenshot shows a web application interface. At the top, there is a status dropdown labeled "Status:" with the placeholder "Select Status" and a "Submit" button. Below this is a message: "No subtasks found". At the bottom of the page, there is a copyright notice: "© 2025 - My ASP.NET Application".

Figure 61: Deleting subtask

7.1.5 Milestone

Before

The screenshot shows a web application interface for 'Milestone Management'. At the top, there is a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. Below the navigation bar is a form with four input fields: 'Project ID' (value: 4), 'Milestone Name' (value: Deployment), 'Resource' (value: Internet), and 'Task ID' (value: 2). A blue 'Submit' button is located below the form. Below the form is a table with four rows, each representing a milestone. The columns are labeled 'Project ID', 'Task ID', 'Milestone', and 'Resources'. The data in the table is as follows:

Project ID	Task ID	Milestone	Resources
1	1	Design Phase Completed	Edit Delete
2	2	Development Phase Completed	Edit Delete
3	3	Testing Phase Started	Edit Delete

At the bottom of the page, there is a copyright notice: © 2025 - My ASP.NET Application.

Figure 62: Before adding milestone

After

The screenshot shows a web browser window for 'Milestone Management'. The URL is https://localhost:44370/Milestone. The page has a header 'Milestone Management' and a form for adding a new milestone. The form fields are: Project ID (Enter ID), Milestone Name (Enter Name), Resource (Enter Resource), and Task ID (Enter ID). Below the form is a table listing milestones:

Project ID	Task ID	Milestone	Resources	
1	1	Design Phase Completed		Edit Delete
2	2	Development Phase Completed		Edit Delete
3	3	Testing Phase Started		Edit Delete
4	2	Deployment	Internet	Edit Delete

At the bottom, there is a copyright notice: © 2025 - My ASP.NET Application.

Figure 63: After adding milestone

Update

Before

Project ID	Task ID	Milestone	Resources	
1	1	Design Phase Completed		Edit Delete
2	2	Development Phase Completed		Edit Delete
3	3	Testing Phase Started		Edit Delete
4	2	Deployment	Internet	Edit Delete

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Figure 64: Before updating milestone

After

Milestone Management

Project ID	Task ID	Milestone	Resources	
1	1	Design Phase Completed		Edit Delete
2	2	Development Phase Completed		Edit Delete
3	3	Testing Phase Started		Edit Delete
4	2	Deployment	Newspaper and magazine	Edit Delete

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Figure 65: After updating milestone

Delete

Before

The screenshot shows a web browser window for 'Milestone Management' at the URL <https://localhost:44370/Milestone>. The page has a light blue header and a white content area. At the top, there are four input fields: 'Project ID:' with placeholder 'Enter ID', 'Milestone Name:' with placeholder 'Enter Name', 'Resource:' with placeholder 'Enter Resource', and 'Task ID:' with placeholder 'Enter ID'. Below these is a blue 'Submit' button. The main content area contains a table with four rows of data. The table has columns: 'Project ID', 'Task ID', 'Milestone', and 'Resources'. The 'Resources' column for the fourth row contains the text 'Newspaper and magazine'. Each row has two buttons in the last column: 'Edit' and 'Delete'. The footer of the page says '© 2025 - My ASP.NET Application'.

Project ID	Task ID	Milestone	Resources
1	1	Design Phase Completed	<button>Edit</button> <button>Delete</button>
2	2	Development Phase Completed	<button>Edit</button> <button>Delete</button>
3	3	Testing Phase Started	<button>Edit</button> <button>Delete</button>
4	2	Deployment	Newspaper and magazine <button>Edit</button> <button>Delete</button>

Figure 66: Before deleting milestone

After

The screenshot shows a web application titled "Milestone Management". At the top, there is a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. Below the navigation bar, there is a form with four input fields: "Project ID:" (with placeholder "Enter ID"), "Milestone Name:" (with placeholder "Enter Name"), "Resource:" (with placeholder "Enter Resource"), and "Task ID:" (with placeholder "Enter ID"). A blue "Submit" button is located below the form. Below the form is a table with the following data:

Project ID	Task ID	Milestone	Resources	
1	1	Design Phase Completed		Edit Delete
2	2	Development Phase Completed		Edit Delete
4	2	Deployment	Newspaper and magazine	Edit Delete

At the bottom of the page, there is a copyright notice: "© 2025 - My ASP.NET Application".

Figure 67: After deleting milestone

7.1.6 User Project Details

Before

The screenshot shows a web application interface titled "User Project Details". At the top, there is a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. On the right side of the header, there are icons for star, refresh, update, and more. Below the header, the main content area has a title "User Project Details" and a sub-section "User Projects". A dropdown menu labeled "Select User" is open, showing a list of names: Alice (selected), Alice, Bob, Charlie, and Sujan Parajuli. To the right of the dropdown is a "Search" input field. Below the dropdown, there is a table with the following data:

Project Name	Start Date	End Date	Status	Role
Project Alpha	January 1, 2024	December 31, 2024	Active	Project Manager

At the bottom left of the page, there is a copyright notice: "© 2025 - My ASP.NET Application".

Figure 68: Before adding project

After

The screenshot shows a web application interface for managing user projects. At the top, there is a navigation bar with links for Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. Below the navigation bar, the title "User Project Details" is displayed. A dropdown menu titled "Select User" shows "Charlie" selected. A search bar is also present. The main content area is titled "User Projects" and contains a table with one row. The table columns are Project Name, Start Date, End Date, Status, and Role. The data in the table is as follows:

Project Name	Start Date	End Date	Status	Role
Project Gamma	March 1, 2024	September 30, 2024	Pending	Tester

At the bottom of the page, a copyright notice reads "© 2025 - My ASP.NET Application".

Figure 69: After adding project

Update

Before

The screenshot shows a web application interface for managing project milestones. At the top, there is a navigation bar with links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. Below the navigation bar, the main title is "Project Milestones". A "Select Project" dropdown menu is open, showing "Project Alpha" as the selected item, with other options like "Project Beta", "Project Gamma", and "New Project" available. To the right of the dropdown is a "Search" input field. On the left, there is a sidebar with project details: Project ID: 1, Project Name: Project Alpha, Start Date: 1/1/2024, Due Date: 12/31/2024, and Status: Active. The main content area is titled "Milestone Details" and contains a table with one row: "Design Phase Completed" under the "Milestone" column and "Resources" column. There are "Edit" and "Delete" buttons at the bottom of this row.

Figure 70: Before updating project milestones

After

The screenshot shows the same web application interface after a update has been made. The navigation bar and main title are identical to Figure 70. The "Select Project" dropdown now shows "Project Beta" as the selected item. The sidebar project details have changed: Project ID: 2, Project Name: Project Beta, Start Date: 2/1/2024, Due Date: 8/31/2024, and Status: Completed. The "Milestone Details" table now shows a single row: "Development Phase Completed" under the "Milestone" column and "Resources" column. The "Edit" and "Delete" buttons are present at the bottom of this row.

Figure 71: After updating milestones

7.1.8 Top Performers

Before

The screenshot shows a web browser window with the URL <https://localhost:44370/TopPerformer>. The page has a dark header with navigation links: Project, Home, About, Contact, Person, Project, Subtask, Task, Milestone, ProjectMilestone, UserProject, and TopPerformer. Below the header, the main content area has a light blue background. A title 'Top Performers' is centered at the top. On the left, there's a section titled 'Top 3 Performers'. Above this section is a 'Select Project' dropdown menu with the following options: Project Gamma (selected), Project Alpha (highlighted in grey), Project Beta, Project Gamma, and New Project. To the right of the dropdown is a 'Search' input field. Below the dropdown, a message says 'No performers found for this project.' At the bottom of the page, a copyright notice reads '© 2025 - My ASP.NET Application'.

Figure 72: before top performers

After

The screenshot shows the same web browser window after optimization. The URL remains <https://localhost:44370/TopPerformer>. The header and main content area are identical to the 'before' screenshot. However, the 'Select Project' dropdown now only contains one item: 'Project Alpha'. The 'Search' input field is also present. Below the dropdown, the message 'No performers found for this project.' is still displayed. The copyright notice at the bottom is also present.

Figure 73: After top performers

1. Missing Event Handler Error (CS1061)

Error:

'subtask_aspx' does not contain definition for 'btnSubmit_Click'

Cause:

Button's OnClick event specified in markup but method missing in code-behind

Solution:

Add this to Subtask.aspx.cs:

csharp

Copy

```
protected void btnSubmit_Click(object sender, EventArgs e)
{
    // Your submission logic here
    // Example: Insert subtask to database
}
```

Prevention:

Always double-click buttons in Design View to auto-generate handlers

Maintain consistent naming (OnClick="btnSubmit_Click" ↔ btnSubmit_Click())

2. Type Load Error (Parser Error)

Error:

Could not load type 'datawebWeek1.Person'

Cause:

Namespace/class mismatch between .aspx and .cs files

Solution:

Verify Person.aspx.cs contains:

csharp

Copy

```
namespace datawebWeek1 {  
    public partial class Person : Page {}  
}
```

Ensure Person.aspx directive matches:

html

Copy

```
<%@ Page Inherits="datawebWeek1.Person" CodeBehind="Person.aspx.cs" %>
```

Run HTML

Prevention:

Use Visual Studio's "Rename" (Ctrl+R,Ctrl+R) to sync changes

Rebuild after renaming classes

3. Oracle Data Provider Error (ORA-12154)

Error:

ORA-12154: TNS could not resolve service name

Cause:

Incorrect connection string or missing TNS entry

Solution:

Update Web.config:

xml

Copy

```
<connectionStrings>
  <add name="OracleDB"
    connectionString="Data Source=XE;User ID=upendra;Password=sapkota;" 
    providerName="Oracle.ManagedDataAccess.Client" />
</connectionStrings>
```

Run HTML

Prevention:

Test connections in SQL Developer first

Use 64-bit Oracle Data Provider for 64-bit Visual Studio

Test cases and solution

9. User manual

My website navbar looks like these this

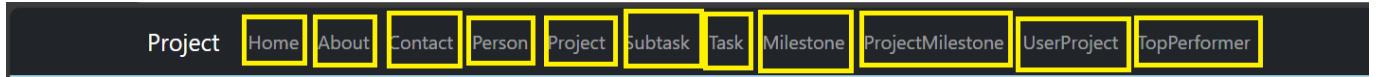


Figure 74: Nav Manual

Step 1: Click on Person or box selected to open web form.

	ID	Name	Email	Contact	Grade
Edit	1	Alice	alice@gmail.com	9876543210	1
Edit	2	Bob	bob@gmail.com	8765432109	2
Edit	3	Charlie	charlie@gmail.com	7654321098	3
Edit	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3

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Figure 75: Click on person web form

Repeat Step 1 for other web form

Step 2: To add data on webforms add data on text box if there are dropdown select dropdown values and click on add button

Person Management

Person ID:	5
Person Name:	IShowSpeed
Person Email:	parajulisujan67@gmail.com
Person Contact:	9815107036
Grade ID:	<input type="text" value="1"/> ▲ ▼
	Submit

Figure 76: Step 3

Step 3

To edit values click edit button change the value of the selected row and click update button. To delete values click on delete button.

	ID	Name	Email	Contact	Grade
	1	Alice	alice@gmail.com	9876543210	1
	2	Bob	bob@gmail.com	8765432109	2
	3	Charlie	charlie@gmail.com	7654321098	3
	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3

Figure 77: Step 4

	ID	Name	Email	Contact	Grade
	1	Alice	alice@gmail.com	9876543210	1
	2	Bob	bob@gmail.com	8765432109	2
	3	Charlie	charlie@gmail.com	7654321098	3
	4	Sujan Parajuli	sujanparajuli2@gmail.com	9827152957	3

Figure 78: Step 5

	ID	Name	Email	Contact	Grade
	1	Alice	alice@gmail.com	9876543210	1
	2	Bob	bob@gmail.com	8765432109	2

Figure 79: Step 6

Step 4 Repeat step 2 and 3 for adding deleting on project milestone task subtask

webform

Step 5 For complex webform, User Project selects user , it will show project list. Repeat step for 5 projects

The screenshot shows a web application interface. At the top, a header bar has a dark blue background with the text "Data and Web Development" in white. Below this, the main content area has a light blue background. The title "User Project Details" is centered at the top of the content area in a dark green font. Below the title, there is a horizontal line. Underneath the line, there is a section labeled "Select User" with a dropdown menu containing the name "Alice". To the right of the dropdown is a "Search" button. Below this section, another horizontal line separates it from the next part. The next part is titled "User Projects" in a dark green font. It contains a table with five columns: "Project Name", "Start Date", "End Date", "Status", and "Role". A single row is visible in the table, showing "Project Alpha" as the project name, "January 1, 2024" as the start date, "December 31, 2024" as the end date, "Active" as the status, and "Project Manager" as the role. At the bottom of the page, there is a copyright notice: "© 2025 - My ASP.NET Application".

Figure 80: Step 7

10. Further Discussion:

Lessons from Database Design & Implementation

1. Understanding Normalization

Initially, terms like 1NF, 2NF, and 3NF felt abstract, but hands-on practice revealed their importance:

1NF: Eliminated repeating groups (e.g., storing multiple tasks in a single project cell).

2NF: Fixed partial dependencies (e.g., a task's status depending only on TASKID, not the full composite key).

3NF: Removed transitive dependencies (e.g., a milestone's resources indirectly tied to PROJECTID).

Challenges:

Redundant data in early designs caused update anomalies.

Foreign key errors during CRUD operations (e.g., deleting a project with existing tasks).

Solutions:

Split tables like PROJECT_MILESTONE to avoid redundancy.

Used ON DELETE CASCADE for automatic cleanup of child records.

2. ERD Design with Oracle SQL Developer

Lessons Learned:

Entities = Tables: Defined clear tables (PROJECT, TASK, MILESTONE).

Relationships = Foreign Keys: Linked TASK to PROJECT via PROJECTID.

Cardinality Matters: Realized a "many-to-many" relationship between tasks and milestones needed a junction table.

Mistakes & Fixes:

Error: Initially missed a relationship between SUBTASK and TASK.

Fix: Added TASKID as a foreign key in SUBTASK.

3. ASP.NET CRUD Implementation

Key Workflows:

Insert: Form validation ensured valid DATE formats before SQL execution.

Delete: Handled constraint errors gracefully (e.g., "Cannot delete Project X with active tasks").

Debugging Wins:

Error: ORA-02291 (foreign key violation) when deleting a project.

4. SQL Query Optimization

Critical Improvements:

Indexes: Added on frequently queried columns (PROJECTID, TASKID).

JOINS > Subqueries: Rewrote slow subqueries as joins for better performance.

5. Testing & Debugging

Common Errors:

Error Code Cause Fix

ORA-12899 "Deployment" exceeded VARCHAR2(10) Increased column size to VARCHAR2(50).

ORA-12170 Connection timeout Adjusted SqlCommand.Timeout.

Proactive Measures:

Tested all queries in Oracle SQL Developer before ASP.NET integration.

Used TRY-CATCH blocks in C# to log errors.

6. Key Takeaways & Future Goals

What Worked:

✓ Normalization minimized data duplication.

✓ ERDs provided a blueprint before coding.

✓ Parameterized queries prevented SQL injection.

Next Steps:

- ◊ Explore Entity Framework for ORM-based development.
- ◊ Implement caching for frequently accessed data.
- ◊ Study NoSQL for unstructured data needs.