

TMA - TM109

- Omar Hossam Haider
- 23513600

PART 1 (Pseudocode):

// Define a Task structure to hold task details

- class Task:
 - title: string
 - description: string
 - dueDate: date
 - priority: enum (high, medium, low)
 - completed: boolean

// Create an empty list to store tasks

empty variable (tasks)

// Function to add a new task to the list

- function addTask(title, description, dueDate, priority):
 - task = create Task with provided details
 - add task to tasks list
 - print "Task added successfully"

// Function to list all tasks

- function listTasks():
 - if tasks is empty:
 - print "No tasks found"
 - else:
 - for each task in tasks:
 - print task details in a readable format

// Function to replace an existing task with new details

- function editTask(id, title, description, dueDate, priority):
 - if id is invalid:
 - print "Invalid task ID"
 - else:
 - find task in tasks list with matching id
 - update task details with provided values
 - print "Task edited successfully"

// Function to mark a task as completed

- function markCompleted(id):
 - if id is invalid:
 - print "Invalid task ID"
 - else:
 - find task in tasks list with matching id
 - set task completed status to true
 - print "Task marked as completed"

// Function to delete a task from the list

- function deleteTask(id):
 - if id is invalid:
 - print "Invalid task ID"
 - else:
 - find task in tasks list with matching id
 - remove task from tasks list
 - print "Task deleted successfully"

// Function to set the priority of a task

- function setPriority(id, priority):
 - if id is invalid:
 - print "Invalid task ID"
 - else:
 - find task in tasks list with matching id
 - update task priority with provided value
 - print "Task priority updated successfully"

// Main function to run the To-Do List application

- function main():
 - display welcome message
 - loop until user chooses to exit:
 - display menu options
 - read user choice
 - handle user choice: - add a task - list all tasks - edit a task - mark a task as completed - delete a task - set task priority - exit the application
 - display goodbye message

PART 2 (CSharp Code):

prerequisites:

- Visual Studio Version 17.0.0
- .NET 8
- ConsoleTables 2.6.1 (NuGet Package)

```
dotnet add package ConsoleTables --version 2.6.1
```

1. Define the Task class:

```
using System;
/// Priority Values
public enum Priority
{
    /// High priority
    High,
    /// Medium priority
    Medium,
    /// Low priority
    Low
}

/// Task Item Model
public class TaskItem
{
    /// Task Title
    public string Title { get; set; }
    /// Task Description
    public string Description { get; set; }
    /// Task Due Date
    public DateTime DueDate { get; set; }
    /// Task Priority
    public Priority Priority { get; set; }
    /// Task Completion Status
    public bool Completed { get; set; }

    /// Task Item Constructor
    public TaskItem(string title, string description, DateTime dueDate,
Priority priority)
    {
        Title = title;
        Description = description;
        DueDate = dueDate;
        Priority = priority;
        Completed = false;
    }
}
```

2. Define The Controller And Methods:

```
using System;
using ConsoleTables;
```

```

using System.Collections.Generic;
using System.Linq;

public static class TodoController
{
    /// Represents the priority of a task.
    private static List<TaskItem> tasks = new List<TaskItem>();

    /// Adds a new task to the task list.
    public static void AddTask(string title, string description,
DateTime dueDate, Priority priority)
    {
        /// Create And Add New Task.
        tasks.Add(new TaskItem(title, description, dueDate, priority));
        /// Print Success Message.
        Console.WriteLine("Task added successfully.");
    }

    /// Lists all tasks in the task list.
    public static void ListTasks()
    {
        /// Check If Task List Is Empty.
        if (tasks.Count == 0)
        {
            /// Print No Task Found Message.
            Console.WriteLine("No tasks found.");
            return;
        }

        /// Create Table.
        var table = new ConsoleTable("ID", "Title", "Description", "Due
Date", "Priority", "Completed");
        /// Loop Through Tasks And Add To Table.
        foreach (var task in tasks.OrderBy(t => t.Priority))
        {
            /// Add Row To Table.
            table.AddRow(tasks.IndexOf(task), task.Title,
task.Description, task.DueDate.ToString("yyyy-MM-dd"), task.Priority,
task.Completed ? "Yes" : "No");
        }

        /// Print Table.
        Console.WriteLine(table.ToString());
    }

    /// Edits an existing task in the task list.
    public static void EditTask(int id, string title, string
description, DateTime dueDate, Priority priority)
    {
        /// Check If Task ID Is Valid.
        if (id < 0 || id >= tasks.Count)
        {
            /// Print Invalid Task ID Message.

```

```

        Console.WriteLine("Invalid task ID.");
        return;
    }
    /// Get Task By ID.
    TaskItem task = tasks[id];
    /// Print Editing Task Message.
    Console.WriteLine($"Editing task: {task.Title}");
    /// Update Task Title.
    task.Title = title;
    /// Update Task Description.
    task.Description = description;
    /// Update Task Due Date.
    task.DueDate = dueDate;
    /// Update Task Priority.
    task.Priority = priority;
    Console.WriteLine("Task edited successfully.");
}

/// Marks a task as completed.
public static void CompleteTask(int id)
{
    /// Check If Task ID Is Valid.
    if (id < 0 || id >= tasks.Count)
    {
        /// Print Invalid Task ID Message.
        Console.WriteLine("Invalid task ID.");
        return;
    }
    /// Mark Task As Completed.
    tasks[id].Completed = true;
    /// Print Task Marked As Completed Message.
    Console.WriteLine("Task marked as completed.");
}

/// Deletes a task from the task list.
public static void DeleteTask(int id)
{
    /// Check If Task ID Is Valid.
    if (id < 0 || id >= tasks.Count)
    {
        /// Print Invalid Task ID Message.
        Console.WriteLine("Invalid task ID.");
        return;
    }
    /// Remove Task From Task List.
    tasks.RemoveAt(id);
    /// Print Task Deleted Message.
    Console.WriteLine("Task deleted successfully.");
}

/// Sets the priority of a task in the task list.
public static void SetPriority(int id, Priority priority)
{

```

```

    /// Check If Task ID Is Valid.
    if (id < 0 || id >= tasks.Count)
    {
        /// Print Invalid Task ID Message.
        Console.WriteLine("Invalid task ID.");
        return;
    }
    /// Set Task Priority.
    tasks[id].Priority = priority;
    /// Print Priority Set Message.
    Console.WriteLine("Priority set successfully.");
}

/// Displays the menu options for managing tasks.
public static void DisplayMenu()
{
    /// Print Menu Options.
    Console.WriteLine("Menu:");
    Console.WriteLine("1. Add");
    Console.WriteLine("2. List");
    Console.WriteLine("3. Edit");
    Console.WriteLine("4. Complete");
    Console.WriteLine("5. Delete");
    Console.WriteLine("6. Set Priority");
    Console.WriteLine("7. Exit");
    Console.Write("Choose an option: ");
}

/// Runs the todo list application.
public static void RunTodoList()
{
    /// Declare Choice Variable.
    string? choice;
    do
    {
        /// Display Menu.
        DisplayMenu();
        /// Get User Choice.
        choice = Console.ReadLine()?.ToLower();
        /// Check User Choice.
        switch (choice)
        {
            /// Add Task.
            case "1":
            case "add":
                /// Get Task Title.
                Console.Write("Enter task title: ");
                string? title = Console.ReadLine();
                /// Get Task Description.
                Console.Write("Enter task description: ");
                string? description = Console.ReadLine();
                /// Get Task Due Date.
                Console.Write("Enter due date (YYYY-MM-DD): ");

```

```

        DateTime dueDate;

        /// Check If Due Date Is Valid.
        if (!DateTime.TryParse(Console.ReadLine(), out
dueDate))
        {
            /// Print Invalid Date Format Message.
            Console.WriteLine("Invalid date format. Task not
added.");

            break;
        }
        /// Get Task Priority.
        Console.Write("Enter priority (high, medium, low):
");

        string? priorityStr = Console.ReadLine()?.ToLower();
        if (priorityStr != "high" && priorityStr != "medium"
&& priorityStr != "low")
        {
            /// Print Invalid Priority Message.
            Console.WriteLine("Invalid priority. Task not
added.");

            break;
        }
        /// Parse Priority.
        Priority priority =
(Priority)Enum.Parse(typeof(Priority), priorityStr, true);
        AddTask(title.ToString(), description.ToString(),
dueDate, priority);
        break;

        /// List Tasks.
        case "2":
        case "list":
            ListTasks();
            break;

        /// Edit Task.
        case "3":
        case "edit":
            /// Get Task ID To Edit.
            Console.Write("Enter task ID to edit: ");
            if (!int.TryParse(Console.ReadLine(), out int
editId))
            {
                /// Print Invalid Task ID Message.
                Console.WriteLine("Invalid task ID.");
                break;
            }
            /// Get New Task Title.
            Console.Write("Enter new title: ");
            string? newTitle = Console.ReadLine();
            /// Get New Task Description.

```

```

        Console.WriteLine("Enter new description: ");
        string? newDescription = Console.ReadLine();
        /// Get New Task Due Date.
        Console.WriteLine("Enter new due date (YYYY-MM-DD): ");
        DateTime newDueDate;

        if (!DateTime.TryParse(Console.ReadLine(), out
newDueDate))
        {
            /// Print Invalid Date Format Message.
            Console.WriteLine("Invalid date format. Task not
edited.");
            break;
        }
        /// Get New Task Priority.
        Console.WriteLine("Enter new priority (high, medium,
low): ");
        string? newPriorityStr =
Console.ReadLine()?.ToLower();
        if (newPriorityStr != "high" && newPriorityStr !=
"medium" && newPriorityStr != "low")
        {
            /// Print Invalid Priority Message.
            Console.WriteLine("Invalid priority. Task not
edited.");
            break;
        }
        /// Parse New Priority.
        Priority newPriority =
(Priority)Enum.Parse(typeof(Priority), newPriorityStr, true);
        EditTask(editId, newTitle.ToString(),
newDescription.ToString(), newDueDate, newPriority);
        break;

        /// Complete Task.
        case "4":
        case "complete":
            /// Get Task ID To Mark As Completed.
            Console.WriteLine("Enter task ID to mark as completed:
");
            if (!int.TryParse(Console.ReadLine(), out int
completeId))
            {
                /// Print Invalid Task ID Message.
                Console.WriteLine("Invalid task ID.");
                break;
            }
            CompleteTask(completeId);
            break;

        /// Delete Task.
        case "5":
        case "delete":

```



```

        /// Get Task ID To Delete.
        Console.WriteLine("Enter task ID to delete: ");
        if (!int.TryParse(Console.ReadLine(), out int
deleteId))
        {
            /// Print Invalid Task ID Message.
            Console.WriteLine("Invalid task ID.");
            break;
        }
        DeleteTask(deleteId);
        break;

    /// Set Priority.
    case "6":
    case "set priority":
        /// Get Task ID To Set Priority.
        Console.WriteLine("Enter task ID to set priority: ");
        if (!int.TryParse(Console.ReadLine(), out int
priorityId))
        {
            /// Print Invalid Task ID Message.
            Console.WriteLine("Invalid task ID.");
            break;
        }
        /// Get New Priority.
        Console.WriteLine("Enter new priority (high, medium,
low): ");
        string? priorityValue =
Console.ReadLine()?.ToLower();
        if (priorityValue != "high" && priorityValue !=
"medium" && priorityValue != "low")
        {
            /// Print Invalid Priority Message.
            Console.WriteLine("Invalid priority.");
            break;
        }
        SetPriority(priorityId,
(Priority)Enum.Parse(typeof(Priority), priorityValue, true));
        break;

    /// Exit Application.
    case "7":
    case "exit":
        /// Print Exit Message.
        Console.WriteLine("Exiting the application.
Goodbye!");

        /// Exit Application.
        Environment.Exit(0);
        break;

    /// Invalid Option.
    default:
        Console.WriteLine("Invalid option. Please try

```

```

again.");
                break;
            }
        } while (choice != "exit" || choice != "7");
    }
}

```

3. Run The Application:

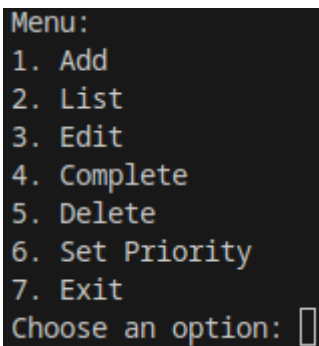
```

/// TMA - M109
/// Omar Hossam Haider
/// 23513600
namespace TMA
{
    /// Main class
    class Program
    {
        /// Entry point
        static void Main()
        {
            TodoController.RunTodoList();
        }
    }
}

```

PART 3-1 (Screenshots):

Main Menu:



```

Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: █

```

1. Add Task:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 1
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 1
Enter task title: Omar
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 1
Enter task title: Omar
Enter task description: TMA
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 1
Enter task title: Omar
Enter task description: TMA
Enter due date (YYYY-MM-DD): 2024-4-28
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 1
Enter task title: Omar
Enter task description: TMA
Enter due date (YYYY-MM-DD): 2024-4-28
Enter priority (high, medium, low): high
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 1
Enter task title: Omar
Enter task description: TMA
Enter due date (YYYY-MM-DD): 2024-4-28
Enter priority (high, medium, low): high
Task added successfully.
```

2. List Tasks:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 2
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 2
-----
| ID | Title | Description | Due Date   | Priority | Completed |
-----
| 0  | Omar  | TMA         | 2024-04-28 | High    | No        |
-----

Count: 1
```

3. Edit Task:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 3
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 3
Enter task ID to edit: 0
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 3
Enter task ID to edit: 0
Enter new title: Hossam
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 3
Enter task ID to edit: 0
Enter new title: Hossam
Enter new description: Project
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 3
Enter task ID to edit: 0
Enter new title: Hossam
Enter new description: Project
Enter new due date (YYYY-MM-DD): 2026-7-21
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 3
Enter task ID to edit: 0
Enter new title: Hossam
Enter new description: Project
Enter new due date (YYYY-MM-DD): 2026-7-21
Enter new priority (high, medium, low): low
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 3
Enter task ID to edit: 0
Enter new title: Hossam
Enter new description: Project
Enter new due date (YYYY-MM-DD): 2026-7-21
Enter new priority (high, medium, low): low
Editing task: Omar
Task edited successfully.
```

4. Mark Task As Completed:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 4
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 4
Enter task ID to mark as completed: 0
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 4
Enter task ID to mark as completed: 0
Task marked as completed.
```

5. Delete Task:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 5
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 5
Enter task ID to delete: 0
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 5
Enter task ID to delete: 0
Task deleted successfully.
```

6. Set Task Priority:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 6
```



```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 6
Enter task ID to set priority: 0
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 6
Enter task ID to set priority: 0
Enter new priority (high, medium, low): medium
```

7. Exit Application:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 7
```

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 7
Exiting the application. Goodbye!
```

PART 3-2 (Handling Errors):

1. Invalid Task ID:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 3
Enter task ID to edit: zero
Invalid task ID.
```

2. Invalid Date Format:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 1
Enter task title: Omar
Enter task description: TMA
Enter due date (YYYY-MM-DD): 2024-88
Invalid date format. Task not added.
```

3. Invalid Priority:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 1
Enter task title: Omar
Enter task description: TMA
Enter due date (YYYY-MM-DD): 2024-4-28
Enter priority (high, medium, low): super
Invalid priority. Task not added.
```

4. Invalid Option:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 17
Invalid option. Please try again.
```

5. No Tasks To List:

```
Menu:
1. Add
2. List
3. Edit
4. Complete
5. Delete
6. Set Priority
7. Exit
Choose an option: 2
No tasks found.
```
