

# TMA - TM109

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- 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

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):

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### 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:

```
/// 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.Write("Enter new description: ");
        string? newDescription = Console.ReadLine();
        /// Get New Task Due Date.
        Console.Write("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.Write("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.Write("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:

```

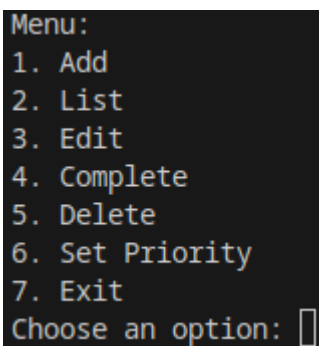
/// TMA - M109
/// Omar Hossam Haider
/// 23513600
namespace TMA
{
    /// Main class
    class Program
    {
        /// Entry point
        static void Main()
        {
            TodoController.RunTodoList();
        }
    }
}

```

---

## 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.
```