

Project Title: Personalized Study Planner

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## Acknowledgment

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I would also like to express my heartfelt gratitude to my family and friends for their constant encouragement and patience throughout the development of this project. Their unwavering confidence in my abilities inspired me to stay committed to creating a high-quality, userfriendly application. Their support was invaluable in helping me stay focused and motivated.

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# 1. Introduction

The Personalized Study Planner is a digital tool designed to help students manage and organize their study schedules in a way that optimizes their productivity and academic performance. In today's academic environment, students are often tasked with managing multiple assignments, projects, and exams across various subjects, which can make it challenging to keep track of deadlines and allocate sufficient study time for each task. This overwhelming workload often results in missed deadlines, last-minute cramming, and insufficient preparation, which can negatively impact academic outcomes and increase stress.

The Personalized Study Planner aims to address these challenges by providing a structured and customizable scheduling system that students can use to organize their academic responsibilities efficiently. The application enables users to add tasks, set specific deadlines, allocate estimated time requirements for each study session, and track their progress over time. This user-centered design allows students to have a clear overview of their study commitments, prioritize tasks based on urgency and subject preferences, and ensure that adequate time is spent on each subject or project.

The core objective of this study planner is to promote effective time management and reduce academic stress by creating a tailored study plan that aligns with individual preferences and deadlines. By helping students focus on high-priority tasks and offering a way to monitor their completed tasks, the study planner serves as a productivity aid. It encourages consistency in study habits and supports students in achieving their academic goals more effectively. In sum, the Personalized Study Planner is a valuable tool for students who seek a structured approach to balancing their academic workload, managing deadlines, and enhancing their overall learning experience.

In sum, The Personalized Study Planner is a digital tool designed to help students organize their study schedules, manage multiple tasks, and meet deadlines effectively. By providing a structured system for task prioritization and progress tracking, the planner promotes efficient time management and reduces academic stress. It enables students to focus on high-priority assignments and build consistent study habits, supporting them in achieving their academic goals more efficiently.

## **2. Objectives and Scope of the Project**

### **Objectives**

The objectives of the Personalized Study Planner are as follows:

- 1. Task Management:** The study planner allows users to efficiently manage their study tasks by enabling them to add specific assignments or study sessions, assign deadlines, and set estimated time durations for each task. This feature helps users break down their workload into manageable tasks, reducing the likelihood of forgetting important assignments and ensuring each task has a designated time for completion.
- 2. Personalized Scheduling:** This feature allows users to set preferences, including their preferred daily study hours, focus subjects, and preferred study pace. Based on these preferences, the planner generates a customized daily study plan that aligns with the user's unique schedule and learning style. This tailored approach not only improves productivity but also ensures that study sessions are more comfortable and sustainable over time.
- 3. Progress Tracking:** To provide users with a sense of accomplishment and keep them motivated, the planner includes a progress tracking system. This allows users to mark tasks as completed, view a list of their finished assignments, and monitor their overall progress. The visual feedback on completed tasks reinforces positive study habits, helping students to stay engaged and encouraged by their achievements.
- 4. Prioritization:** The study planner prioritizes tasks by scheduling them based on their urgency, deadlines, and user-defined preferences. By organizing tasks in this way, the planner ensures that assignments with the earliest deadlines or higher priority are addressed first, helping users avoid last-minute rushes and enhancing their ability to manage time effectively. This feature encourages students to focus on important tasks and reduces stress by maintaining a well-organized, priority-based study routine.

### **Scope**

The scope of the Personalized Study Planner includes essential features to improve user study habits and streamline task management. Task Creation and Management enables users to add, update, and track tasks with details like deadlines and durations, helping students stay organized and avoid missing assignments.

The Daily Scheduling feature generates a personalized study timetable based on user preferences, considering factors like daily study hours, preferred subjects, and task deadlines. This ensures efficient time allocation and balanced workloads, helping prevent last-minute cramming and supporting consistent study habits. The Progress Overview feature allows users to track their achievements through a visual display of completed tasks, boosting motivation.

The project is designed with Modularity in mind, structuring the codebase into separate, reusable components for task management, scheduling, and progress tracking. This modular approach simplifies maintenance, allows for easy feature additions or improvements, and ensures flexibility and scalability as user needs grow.

### 3. Application Tools

The following tools, libraries, and applications were used in the project:

- Programming Language: Python
- IDEs: Visual Studio Code, PyCharm
- Libraries /Packages:
  - `datetime`: For managing dates and deadlines □
- Version Control: Git
- Other Tools:
  - Command-line interface for user interaction.

## 4. Project Design

The project design consists of the following main components:

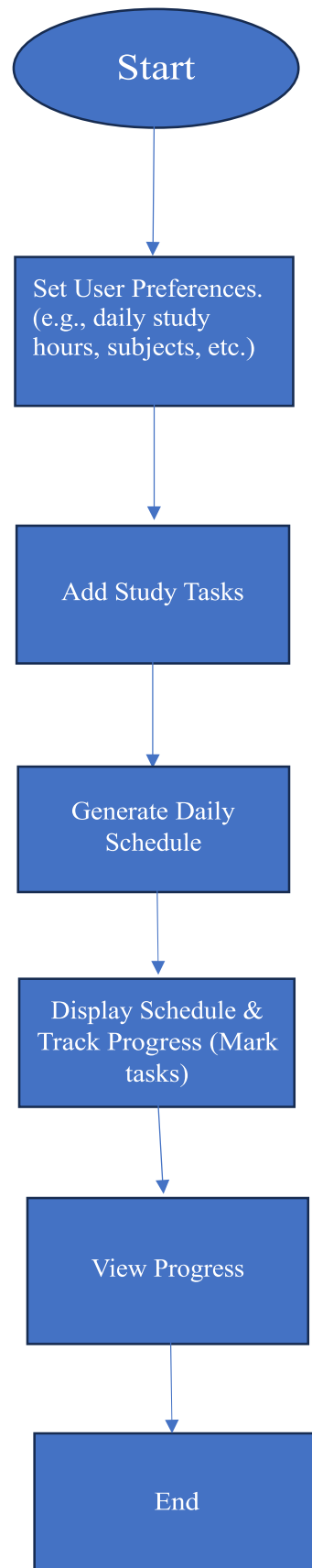
The project is modular, with each component responsible for a specific functionality. Below are the key components:

1. Task Management (task.py): Contains the Task class, which defines a study task with attributes like task name, subject, deadline, duration, and completion status. Each task can be marked as completed.
2. User Preferences and Data Management (user\_data.py): Defines the UserData class, which stores user preferences such as preferred daily study hours and focus subjects. It also maintains a record of completed tasks for progress tracking.
3. Study Planner (planner.py): Contains the StudyPlanner class, which manages tasks based on user preferences, generates a daily study schedule, and prioritizes tasks by their deadlines.
4. Main Application (main.py): Provides the user interface, allowing users to add tasks, set preferences, view the generated schedule, and mark tasks as completed.

## Interaction and Flow

- Users set their study preferences and create tasks using main.py.
- The StudyPlanner class generates a schedule, prioritizing tasks by deadlines and aligning them with the user's available study hours.
- Users complete tasks, which are updated in the schedule, and completed tasks are tracked by UserData.

## **5. Flowchart**





**This flowchart represents a workflow of the Personalized Study Planner project.**

This flowchart outlines the basic flow of a personalized study planner in Python. Here's a breakdown of each step:

In this flowchart:

- The user begins by setting their study preferences.
- They can add new tasks, which are processed by the Task and StudyPlanner classes.
- The system generates a personalized daily schedule based on these tasks and user preferences.
- Users can mark tasks as completed, and their progress is tracked and displayed.

### **Flow Description:**

- **Start:** Initiate the application workflow.
- **Set User Preferences:** Users input their preferences (e.g., daily study hours, subjects of focus).
- **Add Study Tasks:** Users create tasks with details such as task name, deadline, and estimated duration.
- **Generate Daily Study Schedule:** The system uses the tasks and preferences to create a personalized daily study plan.
- **Display Personalized Daily Schedule:** The daily study schedule is shown to the user, detailing tasks and timings.
- **Mark Task as Completed:** Users can mark tasks as completed, updating their status.
- **View Progress Overview:** Users review completed and pending tasks, tracking their study progress.
- **End:** Complete the workflow for the day. The cycle can be repeated as needed.

## **6. Project Implementation**

The implementation phase of the Personalised Study Planner involved detailed planning, structured coding, and iterative testing to deliver a user-centric and visually engaging application. The goal was to create a robust, interactive platform to help users effectively plan and manage their study schedules.

### **Development Process**

#### **1. Task Management System:**

A core functionality of the application is the ability to add, view, and manage tasks. This was implemented using Python's datetime library and a combination of Tkinter widgets such as Entry, Button, and Treeview.

Users can input the task name, deadline, and priority, and the application stores these details in a structured list. Tasks are displayed dynamically in a Treeview, allowing easy tracking of deadlines and priorities.

#### **2. Schedule Generation:**

The schedule generation module organizes tasks based on priority and deadlines. Tasks are distributed across available days, ensuring no single day is overloaded. A maximum of three tasks per day is allowed for balanced scheduling.

The generated schedule is displayed in a separate tab using another Treeview widget, providing users with a clear, day-wise breakdown of their study plan.

#### **3. User Interface Design:**

The application was designed using Tkinter's layout management tools for a responsive and visually appealing interface.

Each tab in the application serves a distinct purpose:

Add Task Tab: Allows users to input task details.

View Tasks Tab: Displays the list of added tasks with options to mark tasks as completed.

Schedule Tab: Generates and displays a personalised study schedule.

Background colors, fonts, and button styles were customized to enhance user experience.

#### **4. Error Handling and Feedback:**

Input validation ensures that tasks are added with valid deadlines and priorities.

Users receive real-time feedback through pop-up messages for actions like successful task addition, task completion, or errors in input.

### **Key Features**

#### **1.Task Addition and Management:**

- Users can easily add tasks with details such as name, deadline, and priority.
- Tasks can be marked as completed, and the list is updated dynamically.

#### **2.Schedule Generation:**

- Tasks are automatically scheduled based on deadlines and priorities.
- A limit on tasks per day ensures balanced workload distribution.

#### **3.Visually Engaging Interface:**

- Tabs for distinct functionalities provide an organized workflow.
- The user-friendly design simplifies navigation and improves usability.

#### **4.Interactive Feedback System:**

- Pop-up messages and alerts keep users informed about their actions.

## Screenshots of the Execution:

```
main.py ×
1  import tkinter as tk
2  from tkinter import ttk, messagebox
3  import datetime
4
5
6  1 usage
7  class PersonalisedStudyPlannerApp:
8      def __init__(self, root):
9          self.root = root
10         self.root.title("Personalised Study Planner")
11         self.root.geometry("800x600")
12         self.root.configure(bg="#f0f0f0")
13         self.tasks = []
14         self.schedule = []
15
16         # Tab Control
17         self.tab_control = ttk.Notebook(root)
18         self.tab1 = ttk.Frame(self.tab_control)
19         self.tab2 = ttk.Frame(self.tab_control)
20         self.tab3 = ttk.Frame(self.tab_control)
```

```
main.py ×
18         self.tab2 = ttk.Frame(self.tab_control)
19         self.tab3 = ttk.Frame(self.tab_control)
20
21         self.tab_control.add(self.tab1, text="Add Task")
22         self.tab_control.add(self.tab2, text="View Tasks")
23         self.tab_control.add(self.tab3, text="Schedule")
24         self.tab_control.pack(expand=1, fill="both")
25
26         # Tab 1 Widgets (Add Task)
27         tk.Label(self.tab1, text="Add Your Tasks", font=("Arial", 16, "bold"), bg="#f0f0f0").pack(pady=10)
28         tk.Label(self.tab1, text="Task Name:", font=("Arial", 12)).pack(pady=5)
29         self.task_name_entry = tk.Entry(self.tab1, width=40)
30         self.task_name_entry.pack(pady=5)
31
32         tk.Label(self.tab1, text="Deadline (YYYY-MM-DD):", font=("Arial", 12)).pack(pady=5)
33         self.deadline_entry = tk.Entry(self.tab1, width=40)
34         self.deadline_entry.pack(pady=5)
35
36         tk.Label(self.tab1, text="Priority (1-5):", font=("Arial", 12)).pack(pady=5)
37         self.priority_entry = tk.Entry(self.tab1, width=40)
```

```

main.py x
36 tk.Label(self.tab1, text="Priority (1-5):", font=("Arial", 12)).pack(pady=5)
37 self.priority_entry = tk.Entry(self.tab1, width=40)
38 self.priority_entry.pack(pady=5)
39
40 tk.Button(self.tab1, text="Add Task", command=self.add_task, bg="#4CAF50", fg="white").pack(pady=10)
41
42 # Tab 2 Widgets (View Tasks)
43 tk.Label(self.tab2, text="Your Task List", font=("Arial", 16, "bold"), bg="#f0f0f0").pack(pady=10)
44 self.tree = ttk.Treeview(self.tab2, columns=("Task", "Deadline", "Priority"), show="headings")
45 self.tree.heading("Task", text="Task")
46 self.tree.heading("Deadline", text="Deadline")
47 self.tree.heading("Priority", text="Priority")
48 self.tree.pack(expand=1, fill="both", pady=10)
49
50 tk.Button(self.tab2, text="Mark as Complete", command=self.mark_task_complete, bg="#FF5722", fg="white").pack(pady=10)
51
52 # Tab 3 Widgets (Schedule)
53 tk.Label(self.tab3, text="Your Study Schedule", font=("Arial", 16, "bold"), bg="#f0f0f0").pack(pady=10)
54 self.schedule_tree = ttk.Treeview(self.tab3, columns=("Task", "Date"), show="headings")
55 self.schedule_tree.heading("Task", text="Task")

```

```

main.py x
57 self.schedule_tree.pack(expand=1, fill="both", pady=10)
58
59 tk.Button(self.tab3, text="Generate Schedule", command=self.generate_schedule, bg="#2196F3", fg="white").pack(pady=10)
60
61 1 usage
62 def add_task(self):
63     task_name = self.task_name_entry.get()
64     deadline = self.deadline_entry.get()
65     priority = self.priority_entry.get()
66
67     try:
68         deadline_date = datetime.date.fromisoformat(deadline)
69         priority = int(priority)
70         if priority < 1 or priority > 5:
71             raise ValueError("Priority must be between 1 and 5.")
72
73         self.tasks.append({"name": task_name, "deadline": deadline_date, "priority": priority, "status": "Pending"})
74         self.update_task_view()
75         messagebox.showinfo(title="Success", message=f"Task '{task_name}' added to your personalised study planner!")
76     except ValueError as e:

```

```

74         messagebox.showinfo(title="Success", message=f"Task '{task_name}' added to your personalised study planner!")
75     except ValueError as e:
76         messagebox.showerror(title="Error", message=f"Invalid input: {e}")
77
78 2 usages
79 def update_task_view(self):
80     for row in self.tree.get_children():
81         self.tree.delete(row)
82
83     for task in self.tasks:
84         self.tree.insert(parent="", index="end", values=(task["name"], task["deadline"], task["priority"]))
85
86 1 usage
87 def mark_task_complete(self):
88     selected_item = self.tree.selection()
89     if not selected_item:
90         messagebox.showwarning(title="Warning", message="No task selected!")
91         return
92
93     task_name = self.tree.item(selected_item, option="values")[0]

```

```

93         if task["name"] == task_name:
94             task["status"] = "Completed"
95             self.update_task_view()
96             messagebox.showinfo(title="Success", message=f"Task '{task_name}' marked as complete!")
97             return
98

```

```

1 usage
99 def generate_schedule(self):
100     today = datetime.date.today()
101     self.schedule.clear()
102
103     # Filter pending tasks
104     pending_tasks = [task for task in self.tasks if task["status"] == "Pending"]
105     if not pending_tasks:
106         messagebox.showinfo(title="No Tasks", message="No pending tasks to schedule.")
107         return
108
109     # Generate schedule
110     task_dates = {}
111     for task in sorted(pending_tasks, key=lambda x: (x["priority"], x["deadline"])):

```

```

110         task_dates = {}
111         for task in sorted(pending_tasks, key=lambda x: (x["priority"], x["deadline"])):
112             days_left = (task["deadline"] - today).days
113             if days_left <= 0:
114                 continue # Skip tasks with past deadlines
115
116             # Distribute tasks over remaining days
117             assigned = False
118             for day in range(days_left):
119                 schedule_date = today + datetime.timedelta(days=day + 1)
120                 if schedule_date not in task_dates:
121                     task_dates[schedule_date] = []
122                 if len(task_dates[schedule_date]) < 3: # Assign max 3 tasks per day
123                     task_dates[schedule_date].append(task["name"])
124                     assigned = True
125                     break
126
127             if not assigned:
128                 task_dates[task["deadline"]].append(task["name"])
129

```

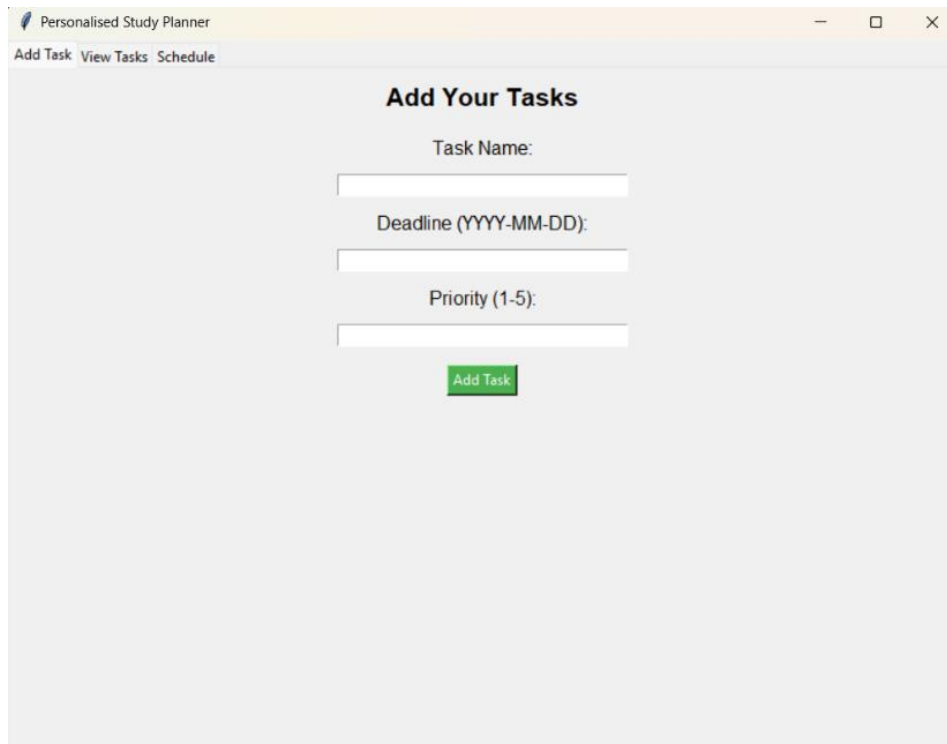
```

131     for date, tasks in sorted(task_dates.items()):
132         for task in tasks:
133             self.schedule.append({"task": task, "date": date})
134
135     self.update_schedule_view()
136     messagebox.showinfo(title="Success", message="Your personalised schedule is ready!")
137
138 1 usage
138 def update_schedule_view(self):
139     for row in self.schedule_tree.get_children():
140         self.schedule_tree.delete(row)
141
142     for session in self.schedule:
143         self.schedule_tree.insert(parent="", index="end", values=(session["task"], session["date"]))
144
145
146 if __name__ == "__main__":
147     root = tk.Tk()
148     app = PersonalisedStudyPlannerApp(root)
149     root.mainloop()

```

## Screenshots of the Implementation:

### 1. Add Task page:



Personalised Study Planner

Add Task View Tasks Schedule

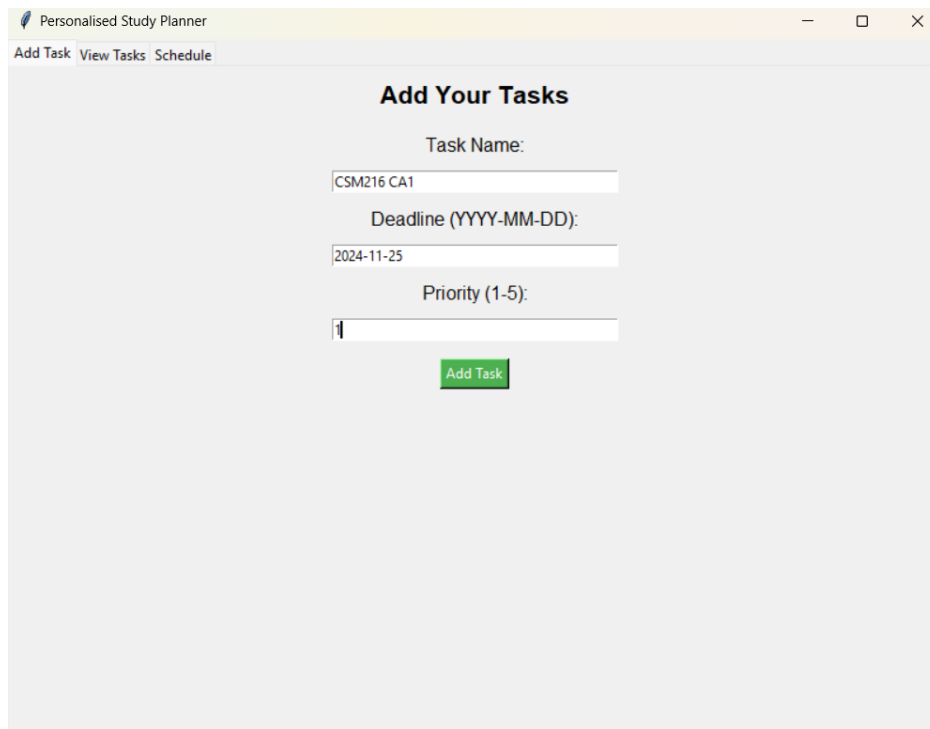
### Add Your Tasks

Task Name:

Deadline (YYYY-MM-DD):

Priority (1-5):

Add Task



Personalised Study Planner

Add Task View Tasks Schedule

### Add Your Tasks

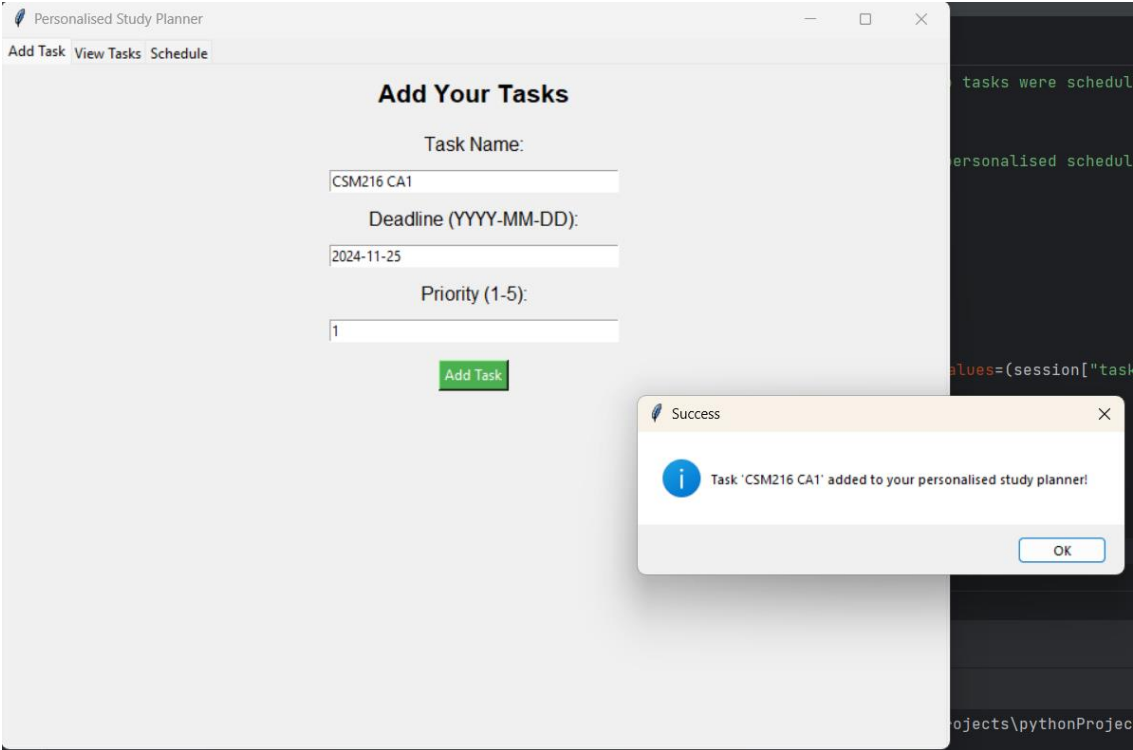
Task Name:

Deadline (YYYY-MM-DD):

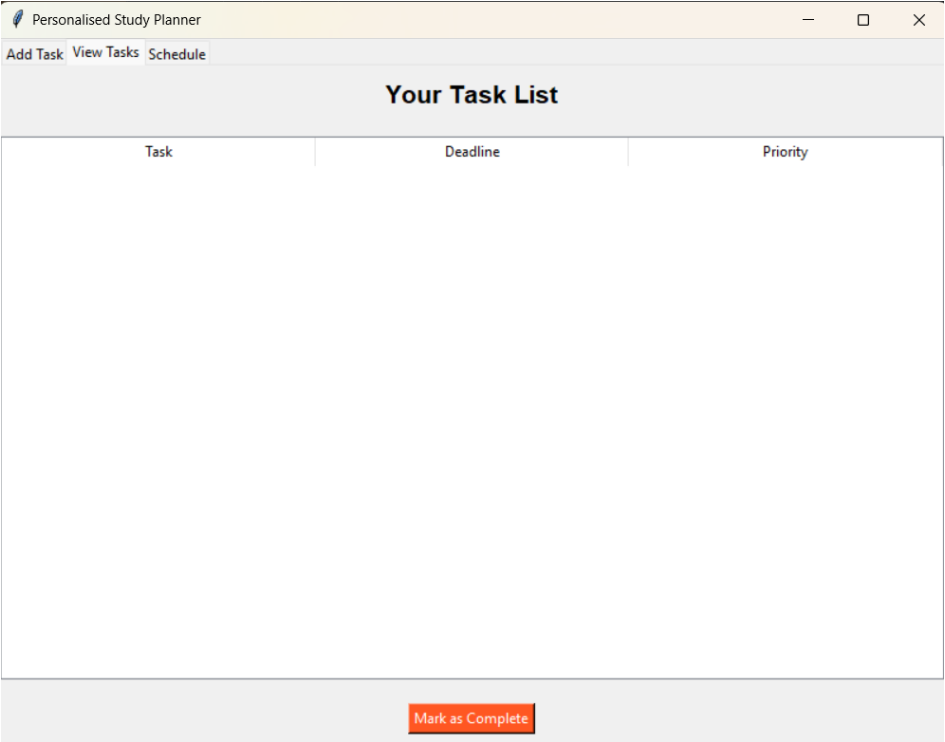
Priority (1-5):

Add Task

2. Tasks added successfully:



3. View task page:



Personalised Study Planner

Add Task

View Tasks

Schedule

Your Task List

Task	Deadline	Priority
CSM216 CA1	2024-11-25	1
CSM216 CA2	2024-11-27	1
CSM228 test1	2024-11-29	2

Mark as Complete

4. for Mark as completed:

Personalised Study Planner

Add Task

View Tasks

Schedule

Your Task List

Task	Deadline	Priority
CSM216 CA1	2024-11-25	1
CSM216 CA2	2024-11-27	1
CSM228 test1	2024-11-29	

Mark as Complete

Success

i

Task 'CSM216 CA1' marked as complete!

OK



5. Page for Scheduling:

Personalised Study Planner

Add Task

View Tasks

Schedule

Your Study Schedule

Task	Date
------	------

Generate Schedule

6. Generated Schedule:

Personalised Study Planner

Add Task

View Tasks

Schedule

Your Study Schedule

Task	Date
CSM216 CA2	2024-11-26
CSM228 test1	2024-11-26

Generate Schedule

Success

i

Your personalised schedule is ready!

OK

## **7. Testing and Validation Report: Personalised Study Planner**

Testing and validation were integral parts of the Personalised Study Planner development process, ensuring the application met its functionality and usability goals. This process was carried out in Unit Testing and System Testing stages, with a dedicated focus on edge cases and user-centric validation.

### **Unit Testing**

Each module of the application was independently tested to verify its correctness and handle edge cases effectively.

#### **1. Task Management Module:**

Adding Tasks:

- Tested with valid inputs to ensure tasks were correctly stored and displayed in the task list.
- Validated error handling for invalid or incomplete inputs (e.g., empty task name, invalid date formats, out-of-range priorities).

Marking Tasks as Complete:

- Verified that selected tasks were accurately updated and removed from the pending list without affecting others.

Treeview Updates:

- Ensured that task data dynamically updated in the Treeview after any modification or completion.

#### **2. Schedule Generation Module:**

Tested task scheduling under varying scenarios, including:

- Tasks with overlapping deadlines.
- Deadlines already passed.
- High-priority tasks to confirm they received earlier scheduling.

Verified task distribution across dates while adhering to a maximum limit of three tasks per day.

Ensured edge cases like an empty task list prompted appropriate feedback.

### **System Testing**

The application was tested as a complete system to confirm seamless integration of its modules and ensure a smooth user experience.

- Task Workflow:

Successfully transitioned from task addition to viewing tasks and generating a schedule without errors.

Checked that the completion of tasks in the "View Tasks" tab updated the data reflected in the "Schedule" tab.

- UI Navigation:

Verified that tab switching (Add Task, View Tasks, Schedule) was responsive and consistent.

- Error Handling:

Ensured that invalid inputs in any module (e.g., incorrect deadlines, priorities out of range) displayed appropriate error messages without crashing the application.

## **Edge Case Testing**

To ensure robustness and handle unexpected scenarios, edge case testing was conducted, focusing on:

1. Empty Inputs:

Prevented blank tasks or incomplete details with clear error messages.

Handled empty schedules gracefully, displaying a prompt indicating no tasks were available to schedule.

2. Invalid Dates:

Rejected deadlines in incorrect formats or dates in the past with meaningful alerts.

3. Exceeding Limits:

Verified the application handled long task names and extreme priority values appropriately, ensuring data integrity.

4. Concurrent Operations:

Tested rapid task addition and schedule generation to confirm stability during fast, successive actions.

## **Validation**

Real-world validation involved user testing to identify usability issues and ensure the application performed well under realistic conditions.

1. User Feedback:

Early user testing identified minor UI improvements, such as increasing button sizes and simplifying error messages for better accessibility.

Feedback on task scheduling confirmed that the generated schedule matched user expectations in terms of prioritization and balance.

2. Cross-Platform Testing:

Validated compatibility across various Windows operating systems.

Tested the application's responsiveness on different screen sizes and resolutions to maintain design consistency.

## **Conclusion**

The Personalised Study Planner project was successfully designed, implemented, and validated to provide an efficient and user-friendly tool for managing tasks and organizing study schedules. With its interactive interface, automated scheduling, and robust error-handling features, the application fulfills its primary objective of helping users improve productivity and time management.

The project emphasized:

1. **Ease of Use:** A visually engaging and intuitive interface ensures that users can quickly navigate through features such as task addition, viewing, and schedule generation.
2. **Personalisation:** Tasks are scheduled dynamically based on user-defined priorities and deadlines, creating a tailored study plan that meets individual needs.
3. **Reliability:** Comprehensive testing and validation ensured the application's functionality, stability, and ability to handle diverse scenarios effectively.
4. **Scalability:** The modular design of the application lays a solid foundation for future enhancements, such as integrating reminders, analytics, or multi-user support.

By addressing user needs and providing practical solutions, the Personalised Study Planner demonstrates the potential of Python-based applications in managing everyday tasks. The project not only highlights the effectiveness of structured planning and implementation but also showcases the versatility of Python and Tkinter for developing real-world software solutions.

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