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Python Project

On

Task Manager

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I am also thankful to my friends for their constructive feedback, which helped refine the functionality and design of the program, ensuring a user-friendly experience.

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1. INTRODUCTION

A GUI or a Graphical User Interface is an interface that uses graphical iconography and images to allow users to interact with an application easily. Such interfaces are built with user experience in mind unlike command line interfaces with are built to achieve functionality. A task manager is an application that allow users to manage the daily tasks by organising tasks and events throughout the day.

The task manager is a crucial utility for operating system maintenance, often used to diagnose issues like unresponsive programs, high resource usage, or to end processes that are slowing down the system. A well-designed Task Manager GUI offers visual indicators, such as charts and graphs, that help users quickly understand system performance
and identify bottlenecks.

Such an application is crucial for a user who wishes to organise and prioritize tasks. This streamlining of tasks allows the user to remain productive throughout the day and optimizes the workflow. An even distribution of tasks throughout the day allows the user to rest and relax while simultaneously allows them to complete initiative before deadlines.
Task manager enhances the efficiency of system management by offering an accessible and comprehensive view of all running processes and system resources, making it an indispensable tool for troubleshooting and optimization.

Benefits of GUI:

- Usability
- Scalability
- Ease of navigation
- Visual representation and digitization
- Multitasking
- Reduced learning curve
- Error handling and specification

2. OBJECTIVES & SCOPE OF PROJECT

Objectives:

The main objectives the program wishes to address are as follows:

- Develop a GUI: develop a comprehensive User interface primarily prioritizes user experience using Tkinter
- Develop a task manager: using the Gui develop an application that allows user to manage and store tasks
- Develop well defined functions: provide optimized functions to achieve functionalities such as add and remove tasks
- Allow for efficient methods to display user commands
- Allow for results to be produced using crawling
- Error handling must be graceful and efficient
- Easy modification and management

Scope:

1. **User Interface Design**
   - Develop a user-friendly GUI using Tkinter that focuses on ease of use and intuitive navigation.
2. **Task Management System**
   - Implement features for adding, editing, deleting, and storing tasks for efficient task tracking.
3. **Optimized Functional Implementation**
   - Create efficient, well-defined functions for core application features to ensure smooth performance.
4. **Command Display and Execution**
   - Provide a method to display user inputs and execute commands through an interactive GUI.
5. **Web Crawling Integration**
   - Enhance functionality by including basic crawling to gather relevant external data based on user tasks.
6. **Error Handling**
   - Implement robust error handling to manage unexpected user inputs and system issues gracefully.

3. APPLICATION TOOLS

Tools and Technologies Used:

- **Python Programming Language**
  - The core language used for building the application due to its simplicity, versatility, and extensive libraries.
- **Tkinter Library**
  - Python library used to develop the graphical user interfaces .
- **Custom Tkinter Library**
  - An optimized version of Tkinter library that offer more versatile and visually appealing widgets.
- **Object-Oriented Programming (OOP)**
  - Use if class and methods to define objects enabling for easy maintenance and modularity
- **Data Persistence Tools (e.g., JSON or CSV)**
  - JSON or CSV files are used for saving and loading task data, allowing persistent storage across sessions.
- **Error Handling and Debugging Tools**
  - Using try and catch blocks of code to promptly handle errors that might arise.
- **IDE (Integrated Development Environment)**
  - Development is done using Python-friendly IDEs like **PyCharm**, **VS Code**, or **IDLE**, offering code suggestions and debugging support.
- **Version control :**

  Version control of the project is done use git repositories

These tools and technologies are chosen for their efficiency, ease of use, and ability to support the requirements of a comprehensive task manager application.

The provided Python scripts offer two distinct GUI-based applications built using Tkinter: a user management system and a task management tool. Both serve as introductory examples for understanding GUI programming in Python and demonstrate key concepts like event handling, user input, and interface design. However, the applications currently use in-memory data storage, limiting their utility for persistent use, and could benefit from further enhancements.

User Management System

The user management application implements basic features such as login, signup, password update, and password retrieval. The user data is stored in a temporary dictionary (`user_db`), which is sufficient for demonstration and small-scale testing but lacks data persistence. This limitation means that once the program is terminated, all stored user information is lost, highlighting the need for potential integration with a database for more practical, real-world use.

Key functionalities include:

- on_login(): This function handles user authentication by verifying credentials against the stored data, providing feedback on the success or failure of the login attempt.
- on_signup(): Facilitates user registration by adding new accounts, while ensuring that usernames are not duplicated.
- on_set_password(): Allows existing users to update their password, offering a basic mechanism for credential management.
- on_forgot_password(): Retrieves and displays the current password for users who cannot remember their credentials.
- on_create_account(): Provides an alternative method for user registration, similar in functionality to the signup feature.

The user interface includes input fields for username and password, along with buttons for each action (e.g., login, signup, password update). The interface is visually enhanced with a gradient background created using Tkinter's `Canvas` widget, making the application more engaging. The layout prioritizes simplicity and ease of use, allowing users to navigate the various features

without difficulty. Future improvements could focus on adding persistent storage, such as a database, and implementing secure password handling techniques like hashing.

Task Management Tool

The task management tool provides a simple yet effective interface for organizing and manipulating tasks. It consists of two main components: the `TaskManager` class, which handles the core task logic, and the `UpcomingTasksPage` class, which manages the graphical user interface. The application allows users to view, add, delete, postpone, and reorder tasks, offering a flexible approach to task management.

The main features include:

- view_tasks(): Presents a dialog listing all current tasks, giving users a comprehensive view of their upcoming responsibilities.

- add_task(): Enables users to add new tasks, facilitating dynamic updates to their task list.

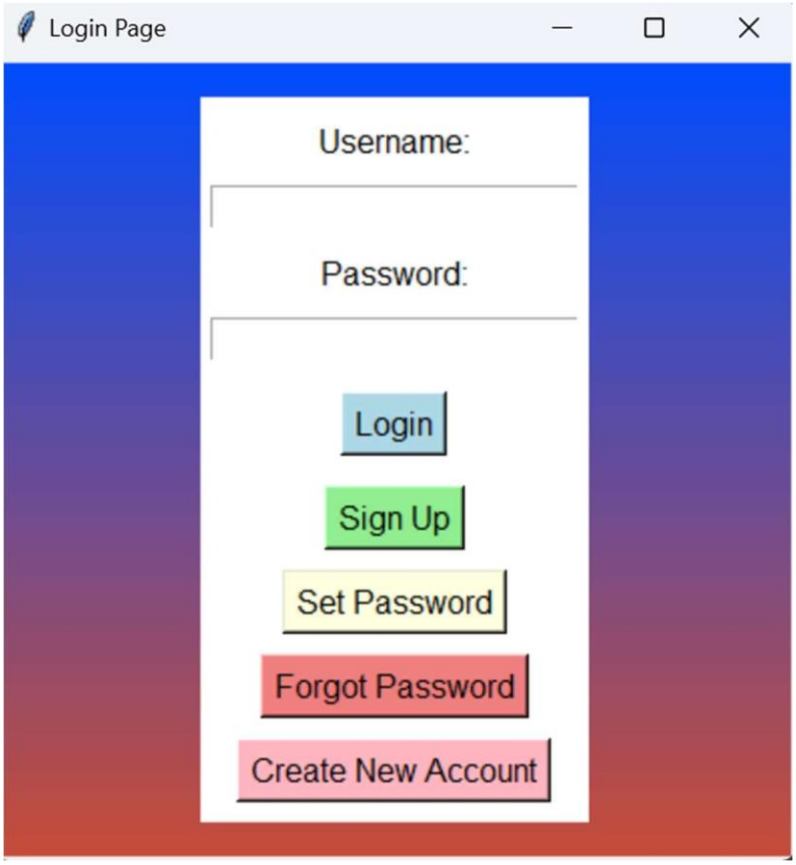
- delete_task(): Allows users to remove tasks, keeping the task list relevant and clutter-free.

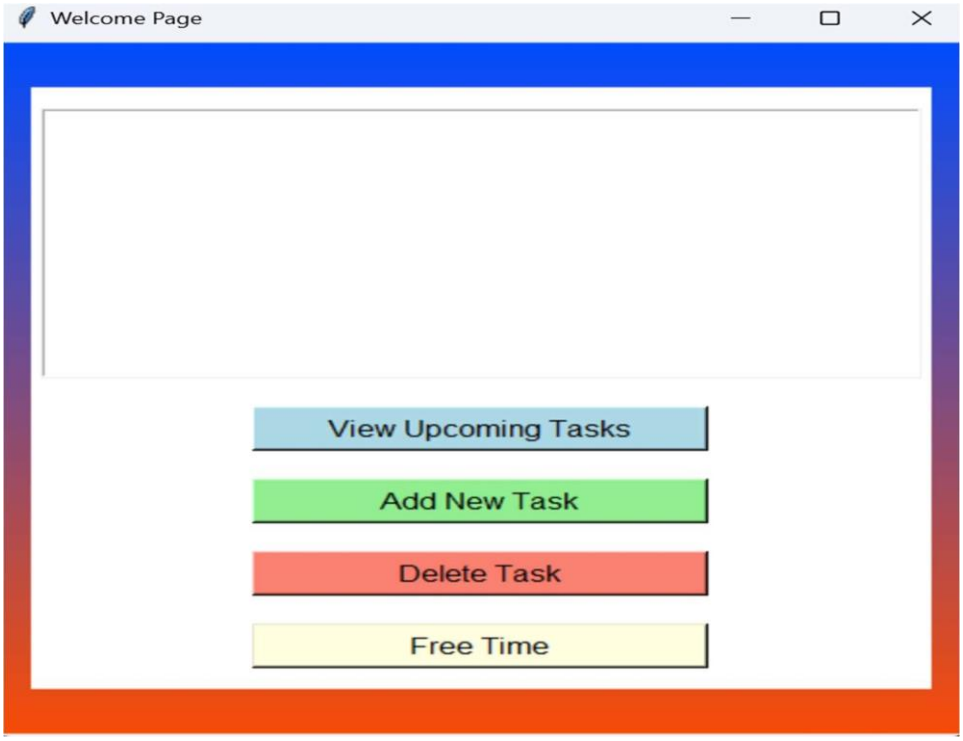
- update_task_listbox(): Refreshes the displayed list of tasks in the GUI whenever changes are made, ensuring an accurate and up-to-date view.

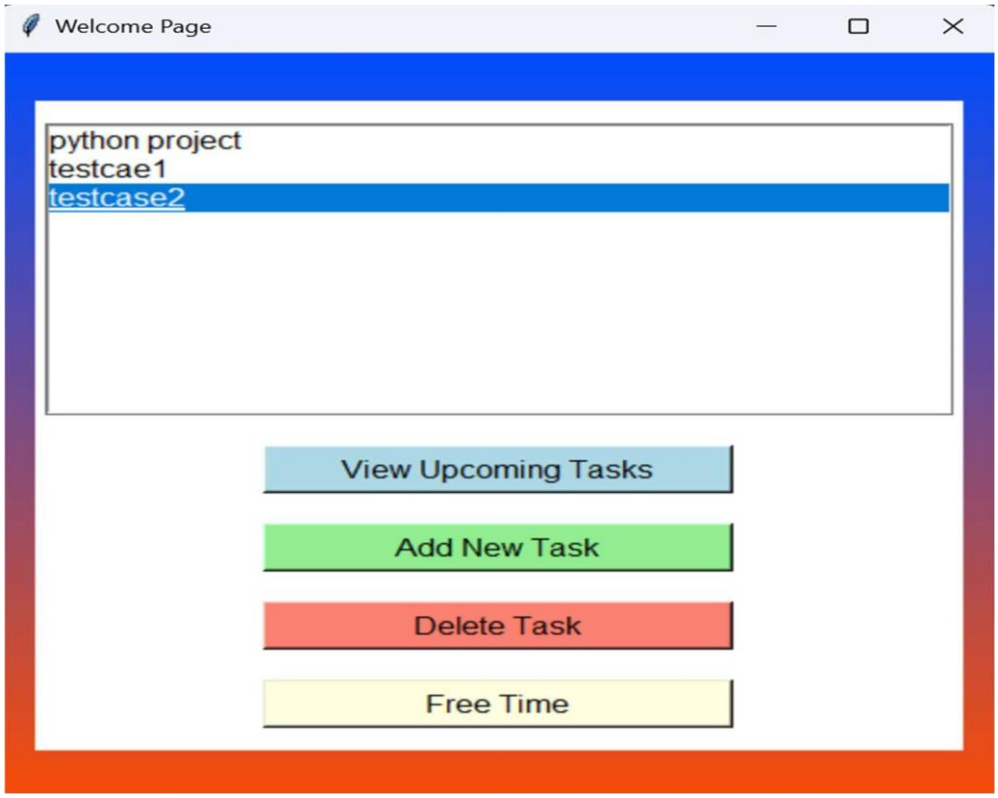
- free_time(): Introduces a simple placeholder feature for managing free time, offering users a chance to consider breaks in their schedule.

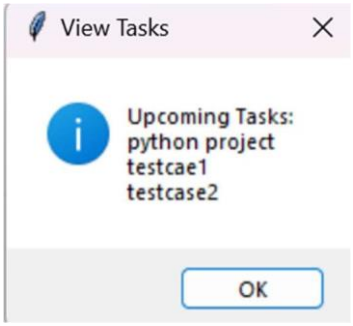
The user interface leverages Tkinter widgets such as `Listbox` for task display and `Button` for interaction, all organized within a central frame. This design promotes usability, providing a clear, intuitive layout that simplifies task management. Each task is accompanied by interactive buttons that enable users to postpone, prepend, or remove tasks directly from the interface, making task handling straightforward and efficient.

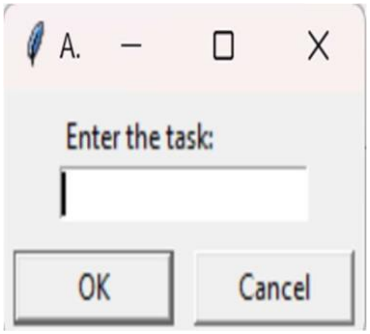
Sample images of the GUI






Welcome Page
python project
testcae1
testcase2
View Upcoming Tasks
Add New Task
Delete Task
Free Time


View Tasks
Upcoming Tasks:
python project
testcae1
testcase2
OK


A.
Enter the task:
OK
Cancel

SCREENSHOTS OF MAIN FUNCTIONAL CODE

```python
import tkinter as tk
from tkinter import messagebox, simpledialog

class WelcomePage:
    def __init__(self, master):
        self.master = master
        self.master.title("Welcome Page")
        self.master.geometry("500x500")


        self.canvas = tk.Canvas(master, width=500, height=500)
        self.canvas.pack()


        for i in range(500):
            color = f'#{i//2:02x}4C{255-i//2:02x}'
            self.canvas.create_line(0, i, 500, i, fill=color)


        self.frame = tk.Frame(master, bg='white', bd=5)
        self.frame.place(relx=0.5, rely=0.5, anchor='center')


        self.task_listbox = tk.Listbox(self.frame, width=50, height=10, font=('Arial', 12))
        self.task_listbox.pack(pady=10)
```

```python
    self.button_view_tasks = tk.Button(self.frame, text="View Upcoming Tasks", command=self.view_tasks,
    self.button_view_tasks.pack(pady=10)


    self.button_add_task = tk.Button(self.frame, text="Add New Task", command=self.add_task, bg='lightg
    self.button_add_task.pack(pady=10)


    self.button_delete_task = tk.Button(self.frame, text="Delete Task", command=self.delete_task, bg='s
    self.button_delete_task.pack(pady=10)


    self.button_free_time = tk.Button(self.frame, text="Free Time", command=self.free_time, bg='lightye
    self.button_free_time.pack(pady=10)


    self.tasks = []

ef view_tasks(self):
    if not self.tasks:
        messagebox.showinfo("View Tasks", "No upcoming tasks.")
    else:
        task_list = "\n".join(self.tasks)
```

```
    def view_tasks(self):
        if not self.tasks:
            messagebox.showinfo("View Tasks", "No upcoming tasks.")
        else:
            task_list = "\n".join(self.tasks)
            messagebox.showinfo("View Tasks", f"Upcoming Tasks:\n{task_list}")

    def add_task(self):
        task = simpledialog.askstring("Add Task", "Enter the task:")
        if task:
            self.tasks.append(task)
            self.update_task_listbox()
            messagebox.showinfo("Add Task", f"Task '{task}' added.")

    def delete_task(self):
        selected_task_index = self.task_listbox.curselection()
        if selected_task_index:
            task_to_delete = self.tasks[selected_task_index[0]]
            del self.tasks[selected_task_index[0]]
            self.update_task_listbox()
            messagebox.showinfo("Delete Task", f"Task '{task_to_delete}' deleted.")
        else:
            messagebox.showwarning("Delete Task", "Select a task to delete.")
```

```
    def update_task_listbox(self):
        self.task_listbox.delete(0, tk.END)
        for task in self.tasks:
            self.task_listbox.insert(tk.END, task)

    def free_time(self):
        messagebox.showinfo("Free Time", "You can manage your free time here.")

if __name__ == "__main__":
    root = tk.Tk()
    app = WelcomePage(root)
    root.mainloop()
```

```python
import tkinter as tk
from tkinter import messagebox, simpledialog

class TaskManager:
    def __init__(self):
        self.tasks = []

    def add_task(self, task):
        self.tasks.append(task)

    def remove_task(self, index):
        if 0 <= index < len(self.tasks):
            del self.tasks[index]

    def postpone_task(self, index):
        if 0 <= index < len(self.tasks):
            self.tasks.append(self.tasks[index])
            self.remove_task(index)

    def prepend_task(self, index):
        if 0 <= index < len(self.tasks):
            self.tasks.insert(0, self.tasks[index])
            self.remove_task(index)
```

```python
class UpcomingTasksPage:
    def __init__(self, master, task_manager):
        self.master = master
        self.master.title("Upcoming Tasks")
        self.master.geometry("600x400")

        self.task_manager = task_manager

        # Frame for the task list
        self.task_frame = tk.Frame(master)
        self.task_frame.pack(pady=20)

        self.update_task_listbox()

    def update_task_listbox(self):
        # Clear the existing task frame
        for widget in self.task_frame.winfo_children():
            widget.destroy()  # Destroy existing widgets in the frame

        for index, task in enumerate(self.task_manager.tasks):
            task_row = tk.Frame(self.task_frame)
            task_row.pack(fill=tk.X, padx=5, pady=5)
```

```
    def postpone_task(self, index):
        self.task_manager.postpone_task(index)
        self.update_task_listbox()

    def prepend_task(self, index):
        self.task_manager.prepend_task(index)
        self.update_task_listbox()

    def remove_task(self, index):
        self.task_manager.remove_task(index)
        self.update_task_listbox()

if __name__ == "__main__":
    root = tk.Tk()
    task_manager = TaskManager()

    # Sample tasks
    task_manager.add_task("Task 1: Complete the report")
    task_manager.add_task("Task 2: Prepare for the meeting")
    task_manager.add_task("Task 3: Buy groceries")
```

```
if __name__ == "__main__":
    root = tk.Tk()
    task_manager = TaskManager()

    # Sample tasks
    task_manager.add_task("Task 1: Complete the report")
    task_manager.add_task("Task 2: Prepare for the meeting")
    task_manager.add_task("Task 3: Buy groceries")

    app = UpcomingTasksPage(root, task_manager)
    root.mainloop()
```

```python
def on_signup():
    username = entry_username.get()
    password = entry_password.get()


    if username in user_db:
        messagebox.showerror("Signup Failed", "Username already exists.")
    elif username == "" or password == "":
        messagebox.showerror("Signup Failed", "Username and password cannot be empty.")
    else:
        user_db[username] = password
        messagebox.showinfo("Signup Successful", f"Account created for {username}.")

def on_set_password():
    username = entry_username.get()
    if username not in user_db:
        messagebox.showerror("Set Password Failed", "Username does not exist.")
        return
```

```python
new_password = entry_password.get()
if new_password == "":
    messagebox.showerror("Set Password Failed", "New password cannot be empty.")
    return

user_db[username] = new_password
messagebox.showinfo("Set Password Successful", "Password updated successfully.")

new_password = entry_password.get()
if new_password == "":
    messagebox.showerror("Set Password Failed", "New password cannot be empty.")
    return

user_db[username] = new_password
messagebox.showinfo("Set Password Successful", "Password updated successfully.")

f on_forgot_password():
username = entry_username.get()
if username not in user_db:
    messagebox.showerror("Forgot Password Failed", "Username does not exist.")
    return
elif username in user_db:
    messagebox.showinfo("dont worry", f"your old password is {user_db[username]}.")
```

```python
def on_create_account():
    username = entry_username.get()
    password = entry_password.get()

    if username in user_db:
        messagebox.showinfo("Create Account", "You are already a user.")
    elif username == "":
        messagebox.showerror("Create Account Failed", "Username should not be empty.")
    else:
        user_db[username] = password
        messagebox.showinfo("Create Account Successful", f"Account created for {username}.")
```