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Mini Project 3

Aim: To create a Python script that implements the *tkinter* library as a Graphical User Interface (GUI) for *mp2b.py* requirements as below:

- Priority queue is a list of dictionaries
- Priority level is specified as a range of integers (0..9, 9 is lowest priority)
- Key is a priority level in string or int type
- Value is the list of Task objects which maintain attributes of id, timestamp and description

Project Description:

- The Project implements the priority queue , which is a list of dictionaries with, key as the priority level and the value a list of objects of class Task. The class Task has attributes like Task ID, time-stamp and Description
- Methods like put(), get() and list_all() are used to insert item into the queue , get item from the queue having highest priority and to display the contents from the queue
- There are in all two modules: One includes the task class and the other includes the GUI elements
- The GUI elements are accessed by importing the Tkinter lib
- There are 2 entry widgets in order to take the user's input-Priority Level and the task description, and corresponding label widgets to define these entry widgets
- There is a display area which is a labeled frame
- This labeled frame widget contains the text widget in order to display the Priority Queue's contents or any status
- There are in all 4 Button widgets-
    1. Create Task Dictionary: To create a dictionary (priority level: [t1]) as the user enters the input
    2. Put: To insert a task into the PQ
    3. Get: To get all the tasks from the existing PQ in the order of the highest priority
    4. List All: To display the contents of the PQ

Project Insight:

- Used dict() , dict.fromkeys() in order to combine the key:value pair into a dictionary element
- Used getattr() method to get the details of the invoking object by specifying the name of the object and the attribute
- Performed various operations such as pop(), append() and sort() on the list which actually corresponds to the priority queue
- Made use of the datetime.datetime.now() in order to get the current system date and time
- Imported the Tkinter lib in order to access the GUI widgets
- The controls mentioned above are placed on the root container (pack())
- The widgets are initialized in order to meet their purpose (container, text, bg)
- Various methods specific to the widgets are used to get the user's input, display the contents (get(),insert(),delete() and so on)

Expected Results:

- The program when run will pop up a Tk window displaying the GUI
- User can enter the priority level and task description in the provided entry fields
- After entering the input, user will click on 'create task dictionary' button in order to create a dictionary in the form of {PL : [task] } / add the entered values to the dictionary
- The user can also enter the task with a duplicate priority level, which will get appended to the task list of
- After all the inputs are entered, user will click on the 'put' button in order to insert the elements from the dictionary object into the PQ
- As the elements are entered in the PQ, they get sorted
- Now the user can click on the List All button to view the current state of the queue
- This will display the status of the PQ in the display area text filed
- The user can click on the Get button so that the elements from the PQ are popped off in the order of their priority level (making the PQ empty)
- If the user clicks on the List all button , it will list the queue as empty
- The user can again add tasks to the Queue by creating the task dictionary and following the same process

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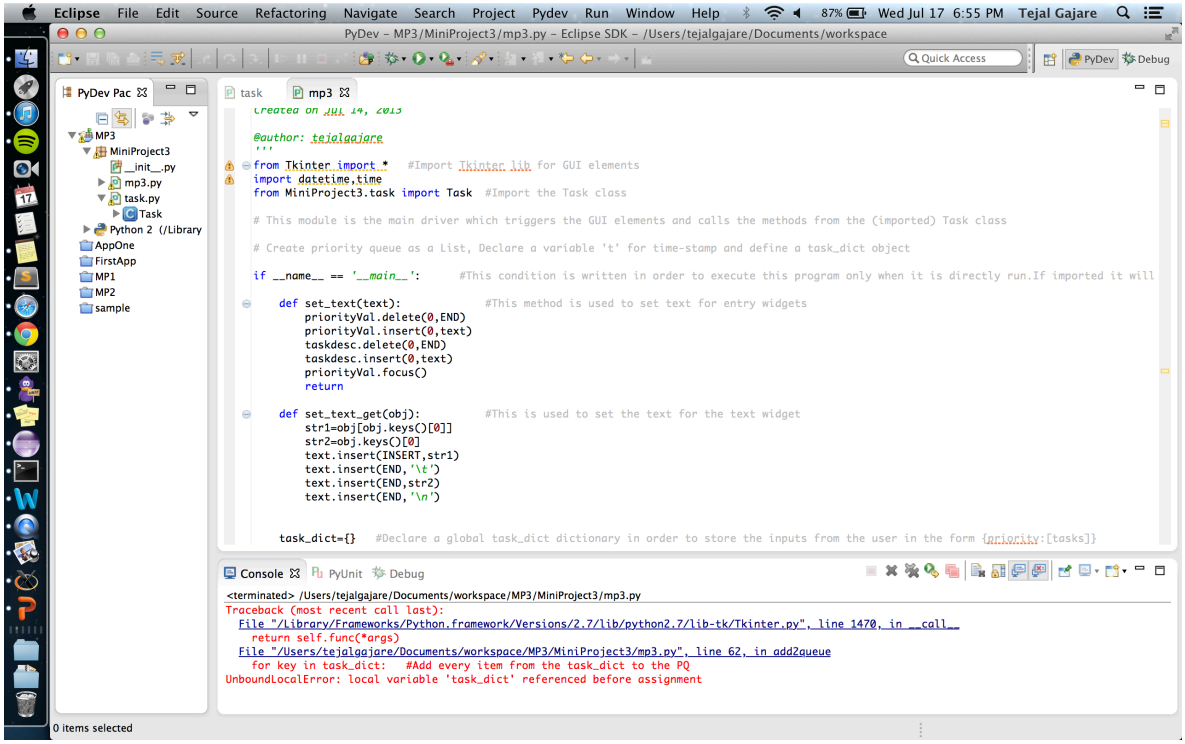
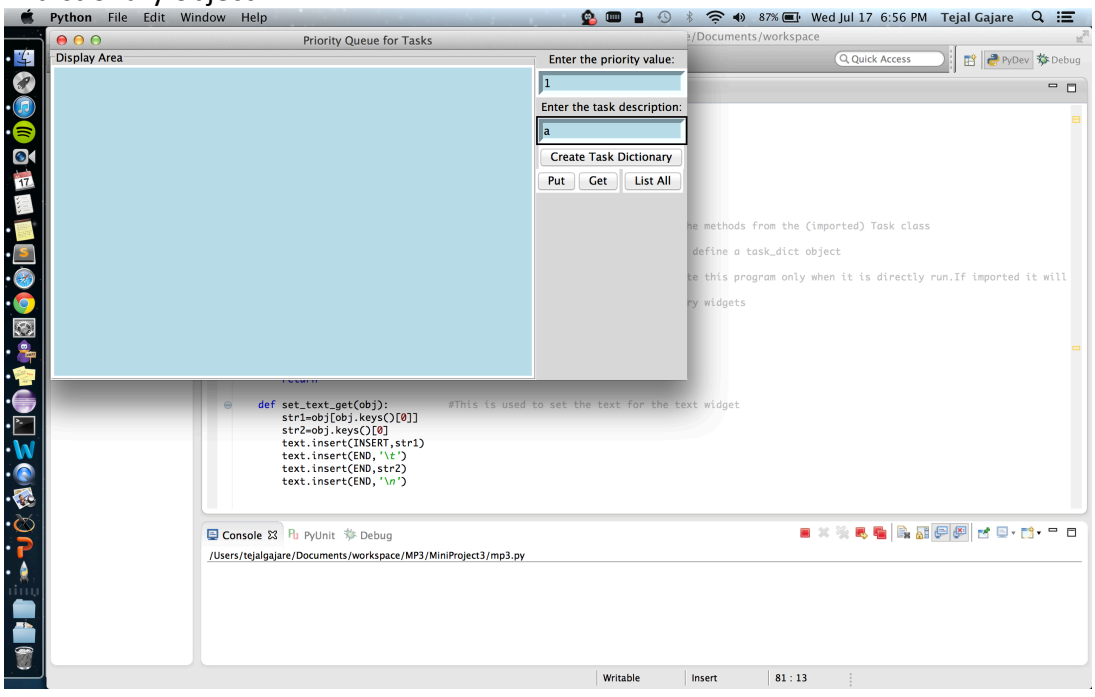
Screen Captures:

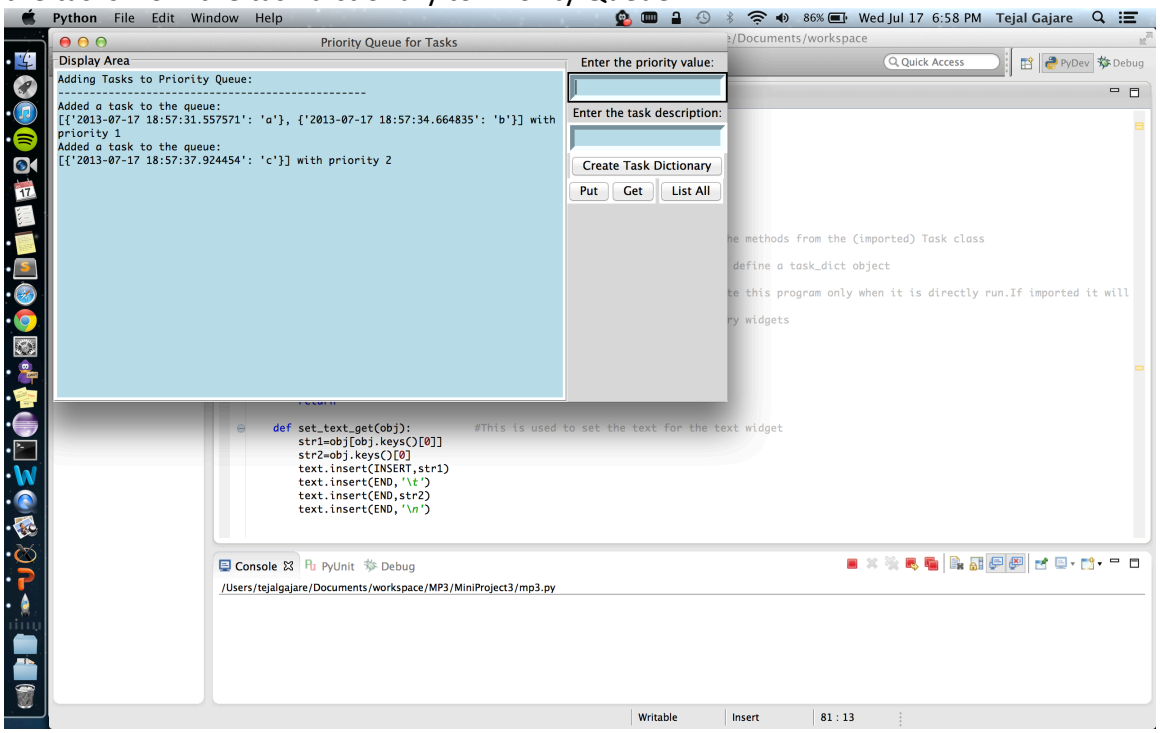
1. Folder Structure



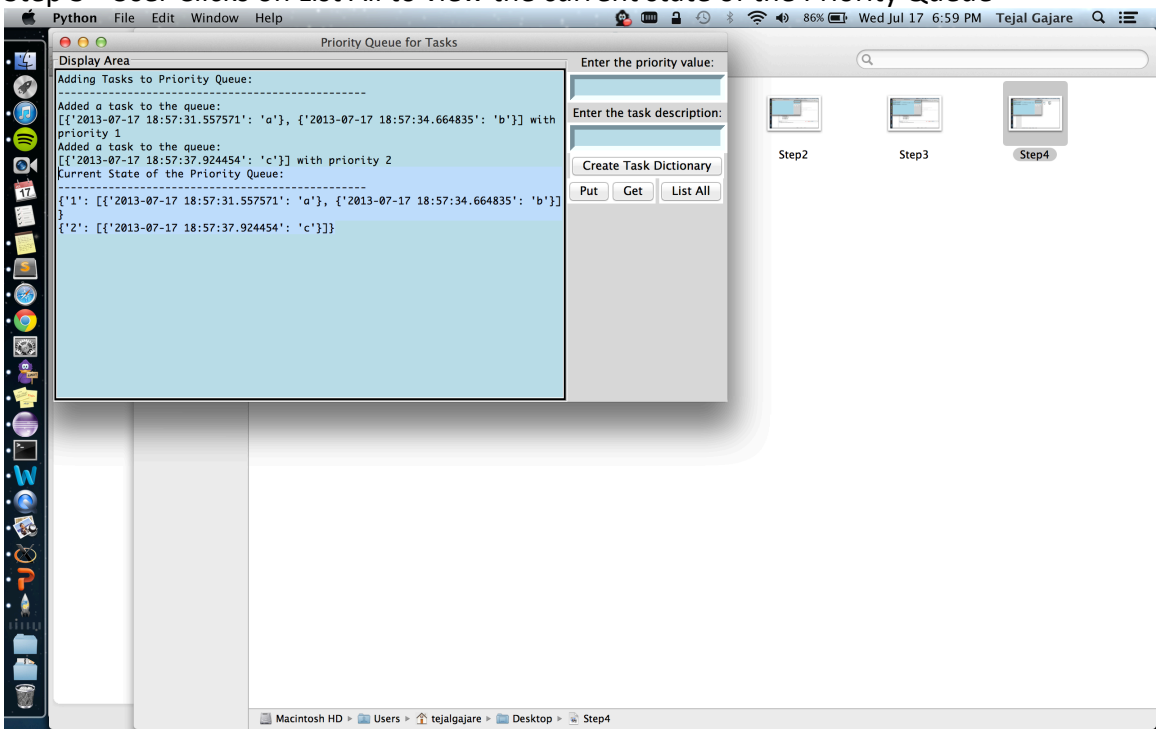
2. Step 1 – User enters the input and clicks on Create Task Dictionary to enter task in dictionary object



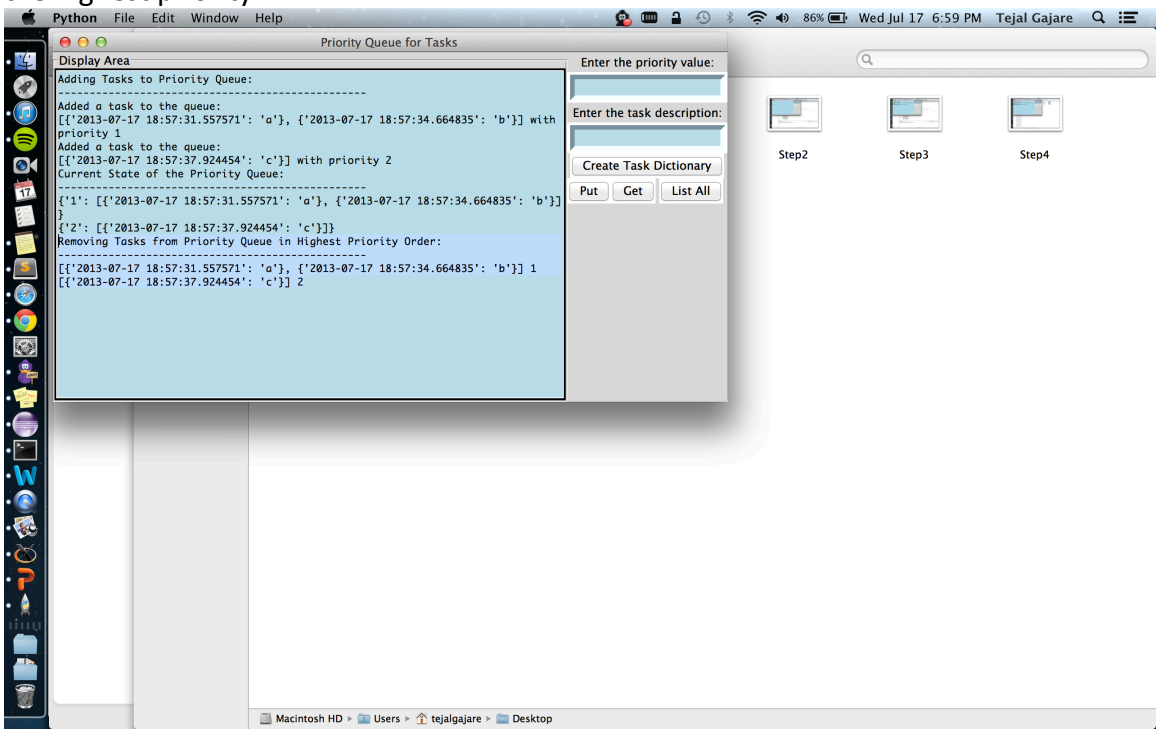
2. Step 2 - After entering all the tasks in the dictionary, user clicks on PUT to add all the tasks from the task dictionary to Priority Queue



3. Step 3 - User Clicks on List All to view the current state of the Priority Queue



4. Step 4 – User clicks on Get Button in order to remove tasks from PQ in order of the highest priority



5. Step 5 – User clicks on List All again, PQ is empty now due to Step4