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Task Manager Software Project
Design Document
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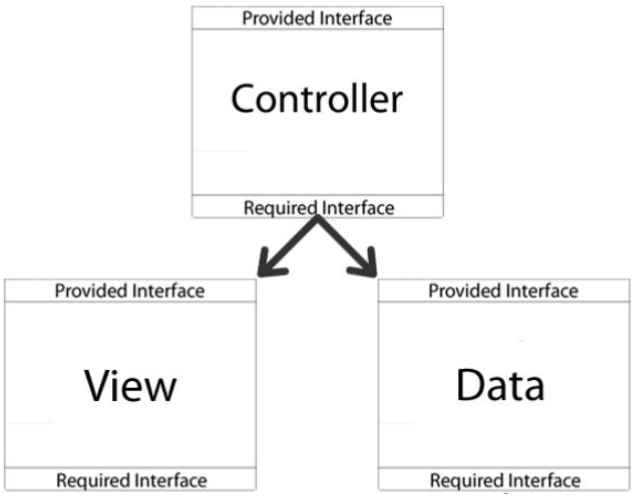
1. Introduction

This is the design document for the Task Management application, per the description in the Project Specification. This program will include the following capabilities:

- User accounts (admin or regular) and authentication
- A database that stores the users, as well as tasks and subtasks
- The creation of tasks by both admin and regular users
- Delegation of tasks and subtasks by users to other users
- Sending and receiving messages between users

2. Architecture

This high-level architecture shows the hierarchy the program will use. It will have a controller that will be responsible for handling data between the database and application, and that will update and receive input from the GUI. The GUI will be used to display data from the database, as well gather data from the user to store in the database.



3. Modules

3.1 Controller

3.1.1 SQL Query Builder

SQL Query Builder is responsible for translating requests for information from the database into SQL queries. It will be capable of translating requests for both adding to the database and pulling data from the database.

SQLQueryBuilder(Task task)

Definition:

Instantiates SQLQueryBuilder with given task

Parameters:

Task task: A task object to be manipulated by SQLQueryBuilder

Returns:

A SQLQueryBuilder object containing the task

ArrayList<Task> getTasks(int ID, String table, String search)

Definition:

Creates a SQL query to retrieve all of the tasks in the database for a particular table

Parameters:

int ID: the userID assigned to the logged in user

String table: The table tasks are being added to

String search: A search string, used to search tasks in the given table

Returns:

An ArrayList of Task objects containing the tasks assigned to the user

ArrayList<Task> getSubTasks(int taskID)

Definition:

Creates a SQL query to retrieve all of the subtasks in the database

for a particular task.

Parameters:

Int taskID: the ID of the task whos subtasks are to be retrieved.

Returns:

An ArrayList of Task objects containing all subtasks who's parent task is the task with an ID of taskID.

ArrayList<Message> getMessages(int ID, String table)

Definition:

Creates a SQL query to retrieve a list of messages in the database

for a specific table in the GUI.

Parameters:

Int ID: the ID number of the user that is currently logged in
String table: the table that will be updated to show the list of messages

Returns:

An ArrayList of Message objects, containing all the messages that are corresponding to the logged in user for the table that is being updated.

ArrayList<String> getCategories()

Definition:

Creates a SQL query to retrieve all categories in the database

Parameters:

None

Returns:

An ArrayList of Strings containing all of the categories stored in the database.

ArrayList<String> getUsers()

Definition:

Creates a SQL query to get a list of all registered users

Parameters:

None

Returns:

ArrayList of all registered users

void addUser(String user, String password, String first, String last, boolean admin)

Definition:

Creates a SQL query to add a user to the database

Parameters:

String user: username of the user
String password: password for the user
String first: first name of the user
String last: last name of the user
boolean admin: specifies whether the user is an admin or not

Returns:

None

void addTask(int ID, boolean isNew)

Definition:

Creates a SQL query to add the task to the database

Parameters:

int ID: The ID of the task to be added

boolean isNew: Whether the task should be displayed in assigned user's inbox

Returns:

None

void addCategory(String cat)

Definition:

Creates a SQL query to add a category to the database

Parameters:

String cat: the category to be added to the database

Returns:

None

void newMessage(int receiverID, String message, int senderID)

Definition:

Creates a SQL query to add a message to the database

Parameters:

int receiverID: the user ID of the receiver of the message

String message: the message to be sent

Int senderID: the user ID of the sender of the message

Returns:

None

3.1.5 Task

The Task class is used to create Task objects, which will be used to hold all of the

Information about a single task.

Task(String num, int parentID, String name, Date sqlDate, String assignedUserName, String description, String notes, String status, boolean isNew, String category, int inPriority, int createdByID)

Definition:

Constructor for Task class

Parameters:

String num: Number of the project the task was created for

int parentID: If subtask, the ID of the task's parent

String name: The name of the task

Date sqlDate: The date that the task is due by

String assignedUserName: The user that the task is assigned to

String description: A detailed description of the task

String notes: Miscellaneous details about the task that don't fit in the description

String status: Completion status of the task

boolean isNew: Whether the task should be displayed in user inbox

String category: The category of this task

int inPriority: The task's priority
int createdByID: The ID of the user that created this task

Returns:

A Task object containing all of the information that was input

3.1.6 Message

The Message class is used to create Message objects, which will be used to hold all of the information for a single message.

Message(String receiver, String message, String sender)

Definition:

Constructor for the Message class.

Parameters:

String receiver: username of the user who will receive the message
String message: the message that will be sent
String sender: username of the user who will send the message

Returns:

A message object containing all of the information that was input.

3.2 View

3.2.1 User Interface

The User Interface will contain a column on the left which displays the user's user name at the top of the column and tabs that correspond to the various functions of the application. The tabs included in the left column are labeled tasks, Inbox, Sent, Archive, Trash. The main UI takes input from the user to select one of the previously mentioned tabs. Once a tab is selected, the user can perform functions that correspond to the selected tab.

MainWindow(String name)

Definition:

Displays the program's main window

Parameters:

String name: Username of the logged in user

Returns:

None

3.2.2 User Login

The User Login is a window that accepts input of a username and password. The password will be hashed and salted and then compared to the password stored in the database for this user. If the password hashes being compared are the same, the user will have successfully been authenticated. After successful authentication, the main UI will be displayed.

LoginWindow()

Definition:

Displays the program's login window

Parameters:

None

Returns:

None

3.2.3 Edit Task Window

The Edit Task Window is a window that is used for creating and editing tasks. It is also used to display subtasks of the currently selected task.

EditTaskWindow(Task task, MainWindow pWindow)

Definition:

Constructor for editing tasks

Parameters:

Task task: The task that is being edited

MainWindow pWindow: A reference to the application's main window

Returns:

None

EditTaskWindow(int userID, MainWindow pWindow, int parentID)

Definition:

Constructor for creating tasks

Parameters:

int userID: ID of the logged in user

MainWindow pWindow: A reference to the application's main window

int parentID: The ID of the tasks parent, should be 0

Returns:

None

EditTaskWindow(int userID, MainWindow pWindow, EditTaskWindow parent, int parentID)

Definition:

Constructor for creating new subtasks

Parameters:

int userID: The ID of the user who is creating the subtask

MainWindow pWindow: A reference to the application's main window

EditTaskWindow parent: A reference to the parent EditTaskWindow of the parent task so that a new subtask can be added to the JTable of subtasks in the parent EditTaskWindow

Returns:

None

3.2.4 Accept Task Window

The Accept Task Window is used for accepting a task from the user's inbox.

AcceptTaskWindow(Task task, MainWindow pWindow)

Definition:

Constructor for creating window

Parameters:

Task task: The task that is being accepted

MainWindow pWindow: A reference to the application's main window

Returns:

None

3.2.5 Main Window

The application's main window. Displays the tables of tasks that are in the database.

MainWindow(String name)

Definition:

Constructor for creating the main window

Parameters:

String name: The username of the logged in user

Returns:

None

3.2.6 Registration Window

The application's registration window. Displays a form to register a user.

Registration()

Definition:

Constructor for creating the registration window

Parameters:

None

Returns:

None

3.3 Data

3.3.1 Database

The application will utilize a mySQL database for storing all information regarding the task managing process. This database will contain four tables to store information about tasks, sub-tasks, messages, categories and the users for the

application. Each task and sub-task entry will store its own unique identification value, a description of what the task requires, the time in which it was created, the user who created the task or sub-task, and the user who was assigned the task or sub-task. Sub-tasks will also have an ID number for the parent tasks stored. An entry in the user table will store a unique identifying value, the username of the individual, the password of the individual, the user's first name, the user's last name, the number of tasks the user is currently assigned to, and the number of tasks the user has finished. An entry in the message table will store the user ID of the receiving user, the user ID of the sending user, and the components of the message itself. An entry in the category table will store only the category string.

4. Integration Test Plan

4.1 Task Object Builder

Description
Check that the Task object is being correctly built
Input
Data for each individual field that will be stored in a Task.
Expected Output
A Task object that contains the parameters and data that the user input

4.2 Load Database

Description
This will test that Load Database pulls all of the tasks assigned to a given user, while not pulling any not assigned to that user
Input
User ID assigned to the user that is logged in
Expected Output
A request to be sent to SQL Query Builder to lookup all of the tasks in the database that are assigned to that user

4.3 SQL Query Builder

Description
This will check that the SQL builder is producing the correct SQL query to pull the necessary information from the database
Expected Output
From the Task Object Builder, a Task object that is to be added to the database
Output
A SQL query that will add the information in the Task object to the database

Input
A user ID from Load Database
Expected Output
A SQL Query that will return every task assigned to the user that corresponds to the user ID that was input

4.4 User Login

Description
This will test that the User Login outputs correct authentication when a user tries to login
Input
A username and password combination that exists in the database
Expected Output
Successful login

Input
A username and password combination that does not exist in the database
Expected Output
Authentication error

4.5 Messaging

Description
This will test that the message are sent correctly between users when one user tries to send a message to another user
Input
A username of the desired person to send a message to and a string containing the message
Expected Output
Successful message send/reception and messages appearing in the corresponding sent/inbox tables

5. Prototype Description

The early prototype for this application consists of 2 main windows. When the application is started, a login window appears. This login window contains 2 text fields that allow the user to enter their username and their password. The password text field hides the text being entered by the user. The login screen contains a login button that currently opens the main window without any authentication. When the main window is opened, multiple tabs are located on the left side. When selecting the “Tasks” tab, a pane becomes visible in the main window with 2 tabs. The first tab is labeled “My Tasks”, which will show a list of the user’s tasks. The second

tab is labeled “All User Tasks”, which will show a list of all users’ tasks. Each tab will display a table of the respective tasks, which contains each individual field of that task. The fields of that task will be displayed in separate columns.

When selecting the “Create New” tab, a pane with multiple text fields and 2 buttons becomes visible in the main window. Each text field has a label that specifies what information needs to be entered into each field. When clicking the “Create” button, a check will be performed to see if the user entered a task name. If the user did not enter a task name, a JOptionPanel appears in the center of the screen stating that a task name must be entered before a task can be created. The user can click the “OK” button to return to the “Create Task” pane. If a User enters a task name and/or any other information for a task and clicks the “Create” button, the Main Window will transition its display to the “My Tasks” tab within the “Tasks” pane and display the updated table showing the newly created task and all of its fields. If the user clicks the “Cancel” button at any time, all of the text fields will be cleared and the main window will transition its display to the “My Tasks” tab within the “Tasks” pane.

When selecting the “Inbox()”, “Archive”, or “Trash” tabs, a pane displaying the table header for task fields will appear. When selecting the “Request Task” tab a pane will appear containing a “Request Task” button and a drop down field. The drop down field does not currently display any options. However, during the implementation phase, a list of all users will be added to the drop down field and the user will be able to select any individual user to request a task from when clicking the “Request Task” button.

When selecting the “Logout” tab, a pane will appear containing a “Logout” button, which currently has no functionality when clicked. The goal during the implementation phase is to have the logout button on the left side of the screen. Upon clicking the logout button, it is anticipated to return to the login screen.

6. Project Plan

The Project Plan lays out goals for the first 3 weeks of the implementation phase, as well as the tasks assigned to each member of the group. Within the next 3 weeks, we plan to accomplish the following:

1. Add user authentication functionality by storing user data in the database (username, password hash). Hash the password entered when the user clicks the “Login” button on the login page and compared it to the hash of the password stored for that user. If they match, the main window will appear.
2. Finalize the fields that need to be entered when creating a task. It is possible that new task fields will be necessary. It is also possible that removing/re-identifying certain task fields will be necessary. All task fields will still be able to be displayed within the tables in the “Tasks” pane.

3. Add inbox functionality for a user. When a user is sent a task or a task request, it will be displayed in a table in the “Inbox()” pane. It is possible that 2 tabs labeled “Task Requests” and “Tasks Pending/Received” will be needed within this pane to display a table of the respective task objects. Functionality will also be added to accept/deny a pending/received task.
4. Add functionality to the “Archive” tab to display a table of task objects that have been fully completed by a user. No in progress tasks will be visible in this table.
5. Add functionality to double click on tasks that are displayed in tabled in order to edit their fields.
6. Add functionality for the user to be able to edit a task’s completion status/progress. When a task is fully complete, it should be automatically sent to the “Archive” table and should not be visible within the “Tasks” pane.
7. Determine whether the “Trash” tab is needed or not. It may prove useful to keep deleted tasks temporarily, but it also may be unnecessary as a task object does not contain much data and can easily be recreated.
8. Add functionality to the “Logout” button so that a user is logged out and the login window reappears.
9. Add functionality to sort tasks within any task object tables by any task field accordingly.
10. Add functionality to search tasks for information entered by the user.
11. Clean up the layout of the GUI for this application so that everything is displayed in a more organized fashion.
12. Modernize the GUI so that the graphics look professional and so that we look like professional developers.

Below are the responsibilities for each group member developing this task management application.

- Aaron Barbary - The manipulation of data extracted from the database via queries to produce specific lists of data from the database.
- Alex Luongo - Overseeing and contributing heavily to the construction/modernization of the layout of the GUI and contribute to the functionality of the GUI.
- Daniel Wallace - Modernizing the appearance of the GUI for a more professional look. Contributing to the functionality of the GUI. Working on developing searching algorithms/sorting algorithms so that users can search tasks for specific information and sort tasks by task fields.
- Jordan Strong - Assisting in construction of the layout of the GUI, adding functionality to the GUI, and working on the communication between a user’s machine running an instance of the application and the server containing the database information.
- Joshua Golding - Contributing to the design and management of mySQL database. Contributing to modernizing the layout of the GUI.
- Matt Czech - Responsible for the design and management of mySQL database including all tables and columns.

Each member of the team developing this application will be working to accomplish the 12 objectives of the project plan detailed above. It is anticipated that more functionality/layout design will be required as new ideas for this application are presented.