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4/22/19

Project Write Up

Summary:

This project aims to use the practice of gamification to increase participation in desired events such as assignment completion in classroom settings. In this program user accounts can be created which, via filestream work, automatically saves any progress/changes that happen during any session. After users have created an account they are presented with a screen allowing them to join groups or create a new group. After they have joined a group they will be able to complete assignments which can will award them experience points. These experience points play a role in leveling up the user. Users earn coins upon leveling up which can then be used to purchase rewards. An active leaderboard is kept for every group which tracks the levels of every user. This shop/reward, level up, experience points, leaderboard systems helps to invoke the gameplay techniques and properly utilize the process of gamification.

Data Structure:

The main data structure being utilized in this program is a binary search tree. I chose to use this specific data structure because this project relies highly upon searching active users within a group. Searches are being used to sort the leaderboard, add points to user accounts, access level status of user, user deletion, group deletion, as well as for all the filestream work when accessing the data associated with all the users. Within this program the BST is being implemented to store each of the users in a particular group. Therefore, a new BST is created for each group that is created and then the nodes in the tree represent a member that has joined that group. This then allows for easy access to the member info for all the members in a group. This also increases the efficiency of the program since for sorting and data manipulation requests the entire user database does not need to be searched. Although time constraints kept me from implementing a self balancing tree, the nodes are updated upon loading into groups so the program stills receives efficiency benefits from using BST's even if its not exactly O(logn).

Methodology:

The program has a few ongoing loops to represent different menus in the project. Therefore upon breaking a loop it will go back to the previous menu. Thus it starts with the login menu which verifies accounts against the created database. After this the

second menu is presented which offers options to create groups, view groups, join groups, etc. This is where some database manipulation occurs to change which groups active users are associated with. Finally the last menu is actual group manipulation. This is where the tree is loaded and manipulation of scores, levels, coins, etc is happening. Think of this program as working like a social media platform where users have to login prior to having access to their account info. Finally once they have access then they can join new groups and progress within those groups.

Results (very limited provided)-see results file for full program run:

```
Please Login or Create a New Account
-------------------------------------
1) Login
2) Create a New Account
3) Exit
1
Please Enter Your Username:
dmans33
Please Enter Your Password:
test

Login Successful!

**********************
Welcome dmans33
**********************


Select An Option Below
----------------------
1) See All Groups Joined
2) Select a Group to view
3) Join a New Group
4) Create a New Group
5) Logout
1

You are a member of the following groups:
thetaTau


Select An Option Below
----------------------
1) See All Groups Joined
2) Select a Group to view
3) Join a New Group
4) Create a New Group
5) Logout
2
```

Please enter the name of the group you would like to view:
thetaTau

Select An Option Below
---
1) View Group Leaderboard
2) Add Points
3) Add Reward to the Shop
4) View Rewards
5) See Used Rewards
6) Add New Assignments
7) View Assignments
8) See Group Assignment Completions
9) Delete User From Group
10) Delete Group
11) GO BACK
1
person15-Level 15
person18-Level 10
person10-Level 10
person12-Level 8
person2-Level 8
person20-Level 6
person17-Level 6
person11-Level 5
person9-Level 5
person3-Level 5
person8-Level 4
person6-Level 4
person5-Level 4
person13-Level 3
person16-Level 2
person7-Level 2
person19-Level 1
person14-Level 1
person4-Level 1
person1-Level 1

Select An Option Below
---
1) View Group Leaderboard
2) Add Points
3) Add Reward to the Shop
4) View Rewards
5) See Used Rewards
6) Add New Assignments
7) View Assignments
8) See Group Assignment Completions
9) Delete User From Group
10) Delete Group
11) GO BACK