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CAB301 Assignment

***An algorithm that you designed for implementing the function “Display the top 10 most frequently borrowed movie DVDs by the members in the descending order of the frequency***

For a function that displayed the top 10 movies two methods were developed. A function that uses the insertion algorithm on an array that always contains the top 10 movies, or the number of movies that have greater than 0 rentals. This method is the better method as it prevents a sorting algorithm each time the top 10 list is requested. Instead the array is available without any modifications when called. The array is instead updated at the rental time of a movie. When a movie is rented, three options can occur:

* The movie could not already be on the list and not have more rentals than the 10th position, in this case nothing is done.
* The movie could not already be on the list but has more rentals than the 10th position. In this case the 10th movie is replaced with the new movie then the list is sorted using insertion sort.
* The movie could already be on the list, in this case insertion sort is called on the current list to see if the movie just rented can move up in the list, again using insertion sort.

***Analysis of the time complexity of the algorithm***

My function runtime of o(1) when requesting the order as it is ordered when renting movies.

Inserting:

***Your functional testing results - screenshots for each of the functional tests.***

|  |  |  |  |
| --- | --- | --- | --- |
|  | Test | Before | After |
| 1 | Invalid staff login |  |  |
| 2 | Valid staff login |  |  |
| 3 | Adding 3 movies to library, will be first, 2nd and 3rd movie in the library. Uses display movies from member actions to view all movies. |  |  |
| 4 | Register a member, with name “Liam H” will be first member and password 0000 |  | |
| 5 | Setting password for new member not using 4 digits. |  | |
| 6 | Get liam h number |  |  |
| 7 | Attempting login with not a real member |  |  |
| 8 | Login with real member but wrong password |  |  |
| 9 | Correct member login |  |  |
| 10 | Rent a movie, uses show members rented movies to verify it works. Rented 2 movies. Also shows the time rented has increased when showing all movies to members |  |  |
| 11 | Attempt to rent a movie with no copies or not a valid title |  | |
| 12 | Attempting to rent a movie that you already have | Refer to after pictures of test 10. |  |
| 13 | Return a movie you have | Refer to after pictures of test 12. |  |
| 14 | Return a movie you don’t have. | Refer to after pictures of test 13. |  |
| 15 | Rent movie 5 to make it most rented. |  |  |
| 16 | Rent and return movie 2 twice to make it most rented | Refer to after of test 15. |  |
| 17 | Most popular when no movies have been rented. Have to restart console to get this output. |  |  |