

CPSC 2430 Spring 2020 Programming Assignment #4

Due date: June 5, 2020 11:59pm

DO NOT USE any of the STL (including the stack and queue type) in your code.

Movie Playlist

The quarter is finally over, and you want to binge watch top-rated movies. You browse through a movie website and add interesting movies to your playlist. Implement a hash table for the playlist using separate chaining for collision resolution.

The class should be named `HashTable` and support the following class functions (default *constructor*, *destructor*). Note that copy constructor and copy assignment for `HashTable` are not required in this assignment. `HashTable` has an array data member called *playlist*.

Movie and MovieNode

Each cell in the `HashTable` *playlist* will point to a linked list of `MovieNodes`. Each `MovieNode` consists of a long int (*key*), a `Movie` (*value*), and a `MovieNode` ptr (*next*).

Each `Movie` has the following data members:

```
string title, genre, contentRating, tagline, director;  
long id;  
int year;
```

Read in all the movies from *movies.csv* and add them to the *playlist*. You can start out with *movies-sample.csv* for testing. Commas (,) in tagline and director fields have been replaced with semicolons (;) so make sure to switch them back to commas.

Hash Table Functions

Implement the following functions:

1. *void addToPlaylist(long key, Movie value)*: add the key-value pair to the table. If the key exists, print a message that the movie is already in your playlist.
2. *bool watchMovie(long key)*: If the movie is not in the playlist, return false. Else print that you have watched [movie name] and remove the movie from the playlist.
3. *void displayMovie(long key)*: If the key exists, display information about the movie as shown in the execution example. Else, tell the user that the movie is not in the playlist.
4. *void displayAll()*: displays the title and the id of all the movies in the playlist.
5. *void displayGenre(string genre)*: displays the title and the id of all the movies in the genre.

Extra Credit (10 points)

Rehash the table when the load factor is greater than 0.7.

Testing and submission

Provide a driver/client program to demonstrate your functions. The user should be able to browse for movies, obtain more information about a movie, and watch a movie. View the execution example to see what the program might look like.

Test ALL the functions of your class thoroughly in the driver, including all the edge cases.

The Movie class should be in two files named **movie.h** and **movie.cpp**. The HashTable class should be in two files named **hash.h** and **hash.cpp**. You can choose where to place MovieNode (in **hash** or in **movie**). The driver should be in a file named **pa4.cpp**.

Submit your program using the following command:

`/home/fac/hkong/submit/cpsc2430/submit_pa4`

Execution example

[pa4]./pa4

Welcome to my movie world! What would you like to do?

1. Browse all movies, 2. Browse by genre, 3. Watch a movie,
4. View more information about a movie: 1

IMDb id: 108052

Title: Schindler's List

IMDb id: 109830

Title: Forrest Gump

IMDb id: 111161

Title: The Shawshank Redemption

IMDb id: 137523

Title: Fight Club

IMDb id: 120737

Title: The Lord of the Rings: The Fellowship of the Ring

IMDb id: 816692

Title: Interstellar

IMDb id: 133093

Title: The Matrix

IMDb id: 468569

Title: The Dark Knight

IMDb id: 68646

Title: The Godfather

IMDb id: 110912

Title: Pulp Fiction

IMDb id: 76759

Title: Star Wars

IMDb id: 1375666

Title: Inception

1. Browse all movies, 2. Browse by genre, 3. Watch a movie,
4. View more information about a movie: 2

Which genre are you looking for? Crime

IMDb id: 111161

Title: The Shawshank Redemption

IMDb id: 68646

Title: The Godfather

IMDb id: 110912

Title: Pulp Fiction

1. Browse all movies, 2. Browse by genre, 3. Watch a movie,
4. View more information about a movie: 3

Enter the ID of the movie you want to watch: 111161

Watched The Shawshank Redemption. Removing it from the playlist!

1. Browse all movies, 2. Browse by genre, 3. Watch a movie,
4. View more information about a movie: 4

Enter the ID of the movie: 111161

Sorry, movie 111161 is not on your playlist

1. Browse all movies, 2. Browse by genre, 3. Watch a movie,
4. View more information about a movie: 4

Enter the ID of the movie: 76759

IMDb id: 76759

Title: Star Wars

Director: George Lucas

Genre: Action

Tagline: A long time ago in a galaxy far, far away...

Year: 1977

Rating: PG

1. Browse all movies, 2. Browse by genre, 3. Watch a movie,
4. View more information about a movie: 0

Hope you enjoyed the movies. Goodbye!