

README

Lab Writeup

Group members:

- Ansh Mendiratta (Wrote main and shelf class implementation) (33%)
- Khoi Tran (Wrote template class implementation and code testing) (33%)
- Thanh Tin (Wrote game class implementation and code testing) (33%)

The objectives and concepts explored in this lab are templates and exceptions. As for their significance in this course and as a career in CS/Engineering, I believe that these concepts are super important, as templates allow you to shorten the time writing functions for multiple data types, and exceptions allow you to handle different types of exceptions that might occur in the system, and let you preemptively handle them instead of letting them affect the user experience.

shelf class

Assuming the class is to be a `Stack`,

1. `add_movie`: post-increment `movie_count` and use its old value to index into the array to set the value.
2. `remove_movie`: pre-decrement `movie_count` and use its new value to index into the array to set the value.

Tests prior to error checking:

```

git:main@~$ make
g++ --std=c++2b main.cpp Movie.cpp Show.cpp Shelf.cpp; ./a.out
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
1
Enter the title of the movie: first
Enter the description of the movie: f
Enter the rating of the movie: 1

--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
1
Enter the title of the movie: second
Enter the description of the movie: s
Enter the rating of the movie: 2

--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
3
2 movie(s) left in the shelf.

```

```

g++ --std=c++2b main.cpp Movie.cpp Show.cpp Shelf.cpp; ./a.out
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
1
Enter the title of the movie: first
Enter the description of the movie: f
Enter the rating of the movie: 5

--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
3
1 movie(s) left in the shelf.
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
2
Title: first
Description: f
Rating: 5
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit

```

```

--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
4
git:main@5>

```

Tests after error checking:

```

(base) macbookpro@MacbookPro-MacBook-Pro Sp2025Lab5GH % g++ --std=c++2b main.cpp Movie.cpp Show.cpp Shelf.cpp; ./a.out
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
3
0 movie(s) left in the shelf.
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
2
EmptyShelfError
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit

```

```

--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
3
10 movie(s) left in the shelf.
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit
1
Enter the title of the movie: 1
Enter the description of the movie: 1
Enter the rating of the movie: 1

FullShelfError
--- OPTIONS ---
Press 1 to add a movie to the shelf
Press 2 to remove a movie from the shelf
Press 3 to see how many movies are on the shelf
Press 4 to quit

```

Trapping the error in `main` versus the calling function

Letting the exception be handled in `main` allows you to handle it however you wish every time it is invoked. If the exception was instead handled in the function, the corresponding `catch` would always run the same code — no matter the situation.

Output of Template Test

```
(base) macbookpro@MacbookPros-MacBook-Pro Sp2025Lab5GH % make entertainment
g++ --std=c++2b MainEntertainment.cpp EntertainmentCollection.cpp Game.cpp -o b.out; ./b.out
--- OPTIONS ---
Press 1 to add a Game to the collection
Press 2 to remove a Game from the collection
Press 3 to see how many Games are on the collection
Press 4 to quit
1
Enter the title of the game: Fallout 76
Enter the description of the game: Fallout 76
Enter the rating of the game: 4.5

--- OPTIONS ---
Press 1 to add a Game to the collection
Press 2 to remove a Game from the collection
Press 3 to see how many Games are on the collection
Press 4 to quit
3
1 Game(s) left in the collection.
--- OPTIONS ---
Press 1 to add a Game to the collection
Press 2 to remove a Game from the collection
Press 3 to see how many Games are on the collection
Press 4 to quit
2
Title: Fallout 76
Description: Fallout 76
Rating: 4.5
--- OPTIONS ---
Press 1 to add a Game to the collection
Press 2 to remove a Game from the collection
Press 3 to see how many Games are on the collection
Press 4 to quit
3
0 Game(s) left in the collection.
--- OPTIONS ---
Press 1 to add a Game to the collection
Press 2 to remove a Game from the collection
Press 3 to see how many Games are on the collection
Press 4 to quit
4
❖ (base) macbookpro@MacbookPros-MacBook-Pro Sp2025Lab5GH %
```

Using a function/class template over making one for each data type saves time and potential discrepancies between them, since all you need to consider is making sure the operations used within the template.