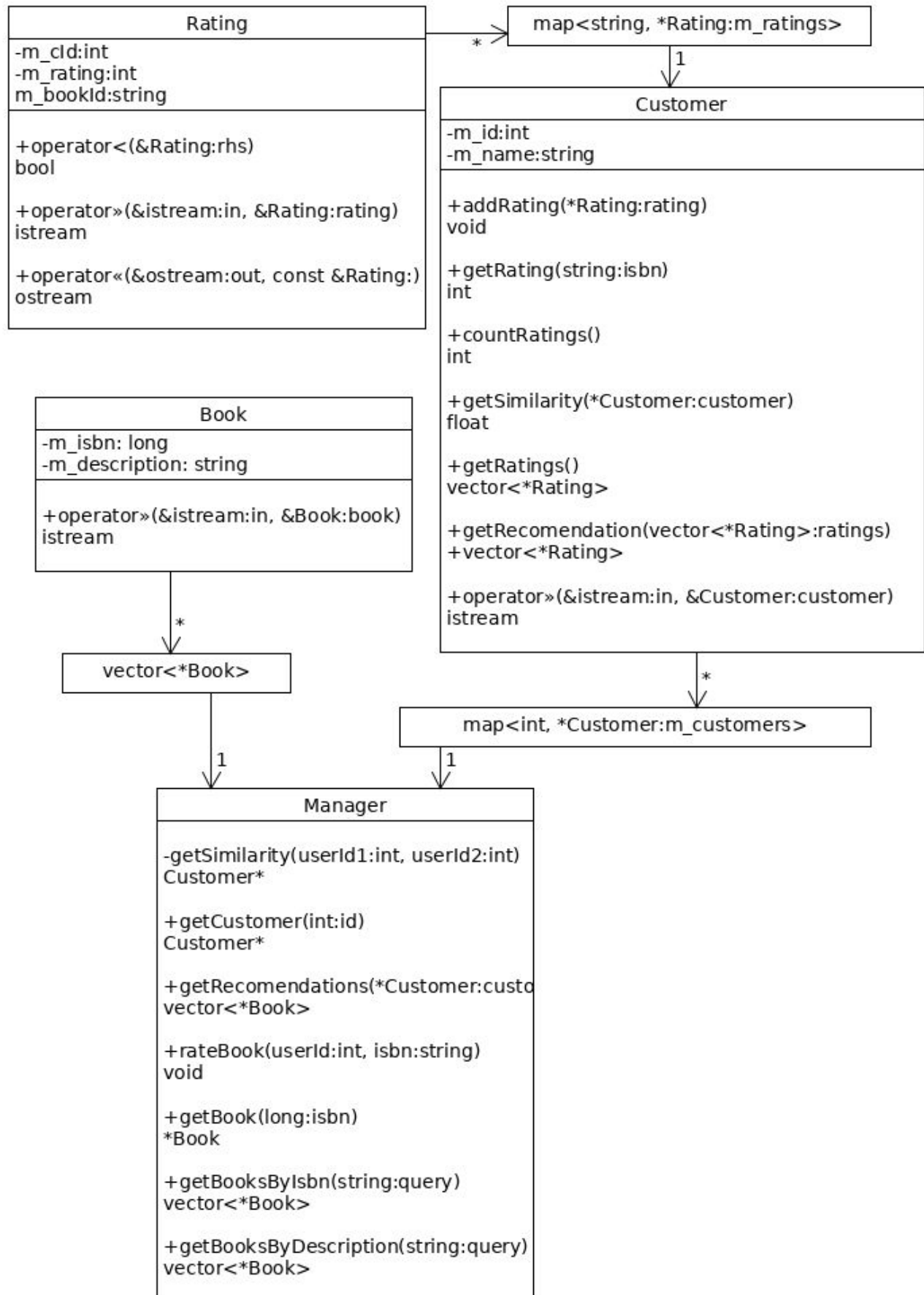


CS 303
Project 2
Gavin Stark
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We completed project 2B for this assignment

Assumptions:

- Assumed that the text files to be read in would have consistent formatting depending on the type of file to be read in.
 - Each class has a specifically written input function to read in the correct format.
- Assumed the text files would be in the same directory as the source code
 - No path for the input files are needed if in the same directory.



Efficiency of Algorithms

Customer::getSimilarity(Customer *customer)

- the method iterates over the internal m_ratings vector and does a calculation for each item (it also references a map object, but reading from the map is $O(1)$) so $O(n)$

Customer::getRecomendations(vector<Rating*> ratings)

- the method iterates over the internal m_ratings vector and iterates over the provided ratings vector for each item, making a single push to a third vector for each item not present in the ratings vector, so $O(n^2)$

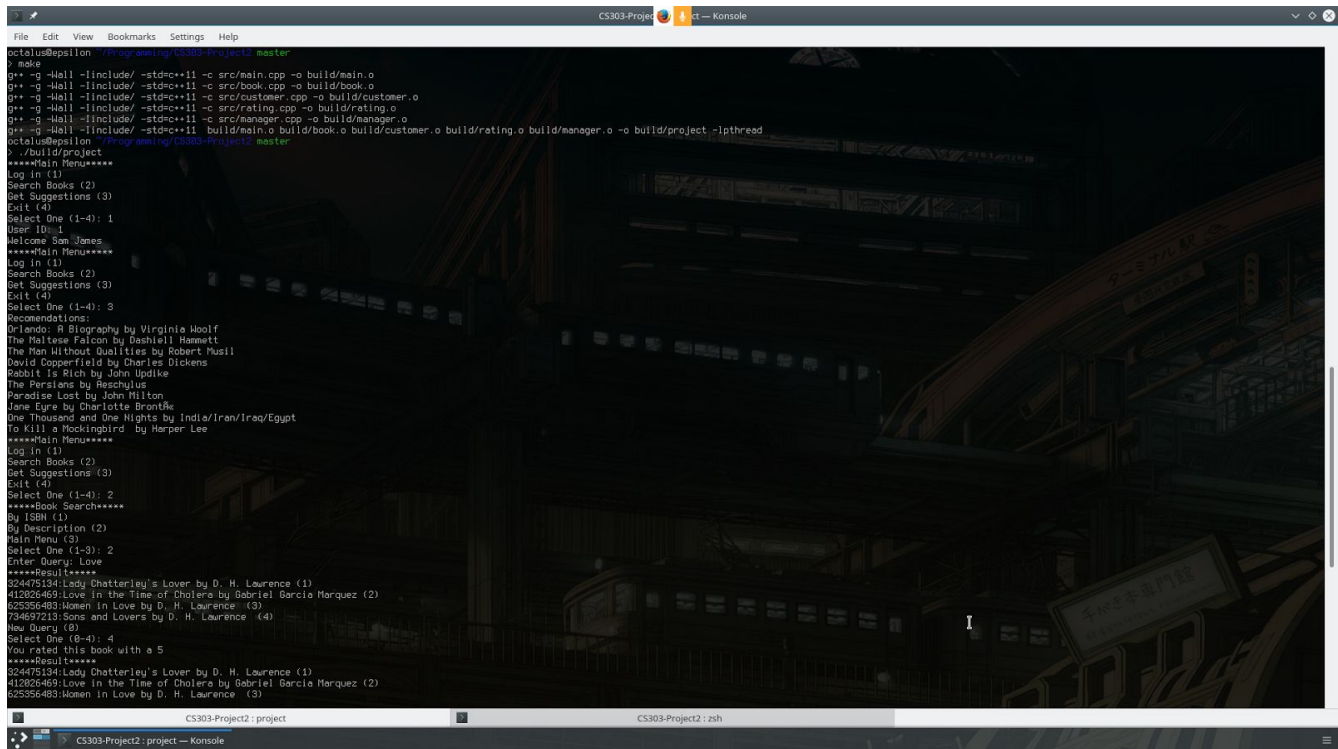
Manager::getRecomendations(Customer *customer)

- the method spawns multiple threads (one for each customer object) that call the Customer::getSimilarity and Customer::getRecomendations methods, these are $O(n)$ and $O(n^2)$ respectively. the method also has multiple $O(n)$ and $O(n^2)$ loops, so $O(n^3)$ since $n * n^2 = n^3$ (number of customers * Customer::getSimilarity)

Manager::getBooksByIsbn and getBooks by Description

- the method iterates over all books in the m_books object performing an $O(n^2)$ string search for each book, so $O(n^3)$

Screenshot of Compiled Program



```
octalusb@psion: ~/Programming/CS303-Project2 master
$ make
g++ -g -Wall -Iinclude/ -std=c++11 -c src/main.cpp -o build/main.o
g++ -g -Wall -Iinclude/ -std=c++11 -c src/book.cpp -o build/book.o
g++ -g -Wall -Iinclude/ -std=c++11 -c src/customer.cpp -o build/customer.o
g++ -g -Wall -Iinclude/ -std=c++11 -c src/rating.cpp -o build/rating.o
g++ -g -Wall -Iinclude/ -std=c++11 -c src/manager.cpp -o build/manager.o
g++ -g -Wall -Iinclude/ -std=c++11 build/main.o build/book.o build/customer.o build/rating.o build/manager.o -o build/project -lpthread
octalusb@psion: ~/Programming/CS303-Project2 master
$ ./build/project
****Main Menu****
Log in (1)
Search Books (2)
Get Suggestions (3)
Exit (4)
Select One (1-4): 1
User ID: 1
Welcome Sam Jones
****Main Menu****
Log in (1)
Search Books (2)
Get Suggestions (3)
Exit (4)
Select One (1-4): 3
Recommendations:
Orlando: A Biography by Virginia Woolf
The Maltese Falcon by Dashiell Hammett
The Man Without Qualities by Robert Musil
David Copperfield by Charles Dickens
Rabbit Is Rich by John Updike
The Persians by Aeschylus
Paradise Lost by John Milton
Jane Eyre by Charlotte Brontë
One Thousand and One Nights by India/Iran/Iraq/Egypt
To Kill a Mockingbird by Harper Lee
****Main Menu****
Log in (1)
Search Books (2)
Get Suggestions (3)
Exit (4)
Select One (1-4): 2
****Book Search****
By ISBN (1)
By Description (2)
Main Menu (3)
Select One (1-3): 2
Enter Query: Love
****Result****
324475134:Lady Chatterley's Lover by D. H. Lawrence (1)
412026469:Love in the Time of Cholera by Gabriel Garcia Marquez (2)
625356483:Women in Love by D. H. Lawrence (3)
794697213:Sons and Lovers by D. H. Lawrence (4)
New Query (0)
Select One (0-4): 4
You rated this book with a 5
****Result****
324475134:Lady Chatterley's Lover by D. H. Lawrence (1)
412026469:Love in the Time of Cholera by Gabriel Garcia Marquez (2)
625356483:Women in Love by D. H. Lawrence (3)
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References:

Linux Man Pages(a copy can be found here: <https://linux.die.net/>)
<http://www.cplusplus.com/reference>
<https://www.tutorialspoint.com/cplusplus/>