Due before:	11:59 PM (before Midnight) on Friday February 28 2020

Introduction to Systems Programming (Systems I)

Homework # 3
Due: Friday February 28 2020 before 11:59 PM
Email-based help Cutoff: 5:00 PM on Thursday, February 27 2020
Maximum Points: 50

Submission Instructions

This part of the homework assignment must be turned-in electronically via Canvas. Ensure you name this document *MUid_homework3*.docx, where *MUid* is your Miami University unique ID. Complete the method shown for each problem. For each method, you can develop and test them in NetBeans and just copy-paste your solutions into this document.

Once you have completed answering the questions save this document as a PDF file (don't just rename the document; that is not the correct way to save as PDF) and upload it to Canvas

General Note: Upload each file associated with homework (or lab exercises) individually to Canvas. Do not upload archive file formats such as zip/tar/gz/7zip/rar etc.

Objective
The objective of this homework is to:
• Develop a custom C++ class to encapsulate Movie information.
• Continue to review the use of file streams for text file I/O
• Further understand the use of std::unordered_map.
• Continue to gain familiarity with developing C++ program involving simple string manipulation

---

Background
In this homework you will be developing a simple program to process movie entries stored in a text file. Your program should enable the user to search the database and print relevant movie information. See sample outputs for commands and options.

Data file format
The supplied movies_db.txt has a space-separated data in the following columnar format:

moveID "Title" year "Genres" ImdbID Rating #Raters

Col#	Name	Data Type	Description
1	moveID	int	Unique ID for a movie
2	title	std::string	A double-quoted title for the movie
3	year	int	The year when the movie was released
4	genres	std::string	A double-quoted list of genres for the movie
5	imdbID	int	The IMDB (Internet Movie Data Base) identifier for the movies
6	rating	float	An average movie rating (assigned by many reviewers)
7	numRaters	int	Number of reviewers who contributed to rating.

Starter Code

File Name	Description
Movie.h	The header file to define a class called Movie with suitable instance variables to encapsulate the 7 fields for each Movie as listed in Data file format. This file have: 1. Constructor 2. Destructor 3. Stream-insertion operator 4. Stream-extraction operator 5. A `to_string` method
Movie.cpp	The source file that implements the methods associated with the Movie class.
Homework3.cpp	This class *must* contain all the necessary logic associated with loading, finding, searching *and listing* movies as discussed below. This file use an `std::unordered_map` to manage movie entries.

Sample outputs

User inputs are shown in **bold**

> Enter a command:
> **exit**

> Enter a command:
> **find 1**
> 1 "Toy Story" 1995 "Adventure|Animation|Children|Comedy|Fantasy" 114709 3.92093 215

> Enter a command:
> **find 36000**
> Movie with ID 36000 not found in database.

Enter a command:
search Titanic
4864 "Titanica" 1992 "Documentary|IMAX" 105601 2.5 1
3403 "Raise the Titanic" 1980 "Drama|Thriller" 81400 4 1
3404 "Titanic" 1953 "Action|Drama" 46435 3.58333 6
1721 "Titanic" 1997 "Drama|Romance" 120338 3.41429 140
Found 4 matche(s).

Enter a command:
list
.
.
4061 "The Man in the Moon" 1991 "Drama|Romance" 102388 4 2
39414 "Shopgirl" 2005 "Comedy|Drama|Romance" 338427 3 7
851 "Basquiat" 1996 "Drama" 115632 2.83333 6
848 "Spitfire Grill, The" 1996 "Drama" 117718 3.28571 7
78746 "Best Worst Movie" 2009 "Documentary" 1144539 4 1
4051 "Horrors of Spider Island (Ein Toter Hing im Netz)" 1960 "Horror|Sci-Fi"
56600 0.5 1
81949 "Romantics, The" 2010 "Comedy|Drama|Romance" 1403988 3 1
842 "Tales from the Crypt Presents: Bordello of Blood" 1996 "Comedy|Horror"
117826 2.54167 12
840 "House Arrest" 1996 "Children|Comedy" 116571 3.375 4
839 "Crow: City of Angels, The" 1996 "Action|Thriller" 115986 2.83333 15
7266 "Lost Skeleton of Cadavra, The" 2002 "Comedy|Horror|Sci-Fi" 307109 4
1
7263 "Miracle" 2004 "Drama" 349825 3.35 10
72178 "Welcome to Dongmakgol" 2005 "Comedy|Drama|War" 475783 4.5 1
4042 "Alamo, The" 1960 "Action|Drama|War|Western" 53580 3.375 4
833 "High School High" 1996 "Comedy" 116531 2 6
163056 "Shin Godzilla" 2016 "Action|Adventure|Fantasy|Sci-Fi" 4262980 4 1
7260 "Latter Days" 2003 "Comedy|Drama|Romance" 345551 3.5 1
829 "Joe's Apartment" 1996 "Comedy|Fantasy|Musical" 116707 2.66667 9
313 "Swan Princess, The" 1994 "Animation|Children" 111333 3.33333 3
52245 "Blades of Glory" 2007 "Comedy|Romance" 445934 3.08824 17
7256 "Touching the Void" 2003 "Adventure|Documentary" 379557 4 8
72171 "Black Dynamite" 2009 "Action|Comedy" 1190536 3.5 2
824 "Kaspar Hauser1" 1993 "Drama|Mystery" 110246 4 1
7251 "Where the Day Takes You" 1992 "Drama" 105810 4 1
.
.
4221 "Necessary Roughness" 1991 "Comedy" 102517 2.625 4
Found 9742 entries.

Attach some of your test run sample output in this docx file.

Submission

- No late assignments will be accepted!
- This work is to be done individually
- The submission file will be saved with the name **HW3yourMUID.pdf**
- The submission file will be saved with the name **HW3yourMUID.cpp**
- Assignment is due Friday February 28, 2020 before Midnight
- On or before the due time, drop the *electronic copy* of your work in the *canvas*

  Don't forget to Turn in the files!   HW3_yourMUID.pdf & HW3_yourMUID.cpp

```
116207 "Zulu" 2013 "Crime|Drama|Thriller" 2249221 1.5 1
26236 "White Sun of the Desert, The (Beloe solntse pustyni)" 1970 "Action|Adventure|Comedy|Drama|Romance|War" 66565 4 1
71205 "Jennifer's Body" 2009 "Comedy|Horror|Sci-Fi|Thriller" 1131734 1 2
45499 "X-Men: The Last Stand" 2006 "Action|Sci-Fi|Thriller" 376994 3.35577 52
6973 "Final Analysis" 1992 "Drama|Romance|Thriller" 104265 2.5 1
26258 "Topo, El" 1970 "Fantasy|Western" 67866 3.9 5
552 "Three Musketeers, The" 1993 "Action|Adventure|Comedy|Romance" 108333 3.2623 61
96945 "Love Lasts Three Years (L'amour dure trois ans)" 2011 "Comedy|Drama|Romance" 1638328 3.5 1
6974 "Freshman, The" 1990 "Comedy|Crime" 99615 3 6
90524 "Abduction" 2011 "Action|Drama|Mystery|Thriller" 1600195 3.5 1
553 "Tombstone" 1993 "Action|Drama|Western" 108358 3.81538 65
32666 "National Lampoon's Lady Killers (National Lampoon's Gold Diggers)" 2003 "Comedy" 376717 1 1
6982 "Forbidden Games (Jeux interdits)" 1952 "Drama|War" 43686 3.5 1
180497 "The Post" 2017 "Drama|Thriller" 6294822 4.25 2
555 "True Romance" 1993 "Crime|Thriller" 108359 3.8 65
1683 "Wings of the Dove, The" 1997 "Drama|Romance" 120520 4.41667 6
104419 "Justice League: Crisis on Two Earths" 2010 "Action|Animation|Sci-Fi" 1494772 3.25 2
3764 "F/X2 (a.k.a. F/X 2 - The Deadly Art of Illusion)" 1991 "Action|Crime|Thriller" 101846 2.3 5
3765 "Hot Spot, The" 1990 "Crime|Drama|Romance" 99797 3 2
1551 "Buddy" 1997 "Adventure|Children|Drama" 118787 2.16667 3
7895 "Bring Me the Head of Alfredo Garcia" 1974 "Crime|Drama|Thriller" 71249 3.5 2
97866 "Imposter, The" 2012 "Documentary" 1966604 4.75 2
145150 "The Dressmaker" 2015 "Comedy|Drama|Thriller" 2910904 3 1
3767 "Missing in Action 2: The Beginning" 1985 "Action|War" 89604 1.66667 3
3771 "The Golden Voyage of Sinbad" 1973 "Action|Adventure|Fantasy" 71569 4 3
6985 "Passion of Joan of Arc, The (Passion de Jeanne d'Arc, La)" 1928 "Drama" 19254 3.9 5
564 "Chasers" 1994 "Comedy" 109403 1.5 2
3773 "House Party" 1990 "Comedy" 99800 2 2
6994 "Hard Way, The" 1991 "Action|Comedy" 102004 3.25 2
6990 "The Great Train Robbery" 1978 "Action|Adventure|Comedy|Crime|Drama" 79240 3.5 1
569 "Little Big League" 1994 "Comedy|Drama" 110363 2.66667 6
1349 "Vampire in Venice (Nosferatu a Venezia) (Nosferatu in Venice)" 1986 "Horror" 91651 5 1
78467 "Jonah Hex" 2010 "Action|Drama|Thriller|Western" 1075747 1.875 4
3784 "Kid, The" 2000 "Comedy|Fantasy" 219854 2.59091 11
158022 "Kicking Off" 2016 "Comedy" 3703750 1.5 1
170875 "The Fate of the Furious" 2017 "Action|Crime|Drama|Thriller" 4630562 2.33333 3
3786 "But I'm a Cheerleader" 1999 "Comedy" 179116 2.625 4
7000 "Hudson Hawk" 1991 "Action|Adventure|Comedy" 102070 3 4
26285 "Dark Star" 1974 "Comedy|Sci-Fi|Thriller" 69945 2.5 1
579 "Escort, The (Scorta, La)" 1993 "Crime|Thriller" 108059 3 1
3744 "Shaft" 2000 "Action|Crime|Thriller" 162650 2.65789 19
80862 "Catfish" 2010 "Documentary|Mystery" 1584016 3.66667 3
55156 "Unreasonable Man, An" 2006 "Documentary" 492499 4 1
80906 "Inside Job" 2010 "Documentary" 1645089 4.29167 12
3788 "Blow-Up (Blowup)" 1966 "Drama|Mystery" 60176 3.66667 6
```

```
8477 "Jetée, La" 1962 "Romance|Sci-Fi" 56119 4.5 2
53468 "Fido" 2006 "Comedy|Horror|Thriller" 457572 3.28571 7
27762 "Comic Book: The Movie" 2004 "Comedy" 361462 2.5 1
2056 "In Search of the Castaways" 1962 "Adventure|Children" 56095 3 1
34450 "Miracles - Mr. Canton and Lady Rose" 1989 "Action|Comedy|Crime|Drama" 98019 4.5 1
8456 "Investigation of a Citizen Above Suspicion (Indagine su un cittadino al di sopra di ogni sospetto)" 1970 "Crime|Drama|T
34162 "Wedding Crashers" 2005 "Comedy|Romance" 396269 3.50862 58
2024 "Rapture, The" 1991 "Drama|Mystery" 102757 3.33333 3
40583 "Syriana" 2005 "Drama|Thriller" 365737 3.53125 16
2057 "Incredible Journey, The" 1963 "Adventure|Children" 57180 3.375 4
40617 "Creep" 2004 "Horror|Thriller" 381966 3 1
2058 "Negotiator, The" 1998 "Action|Crime|Drama|Mystery|Thriller" 120768 3.35 30
170837 "Life-Size" 2000 "Children|Comedy|Fantasy" 200809 4 1
2059 "Parent Trap, The" 1998 "Children|Comedy|Romance" 120783 3 15
8481 "Northwest Passage" 1940 "Action|Adventure|Drama|Romance|Thriller|Western" 32851 3 1
2060 "BASEketball" 1998 "Comedy" 131857 3.07143 14
8487 "Please Don't Eat the Daisies" 1960 "Children|Comedy|Musical" 54188 3.5 2
27772 "Ju-on: The Grudge" 2002 "Horror" 364385 2.58333 6
2066 "Out of the Past" 1947 "Film-Noir" 39689 4.125 4
66310 "Frontière(s)" 2007 "Drama|Horror|Thriller" 814685 3.5 1
27751 "'Salem's Lot" 2004 "Drama|Horror|Mystery|Thriller" 355987 5 1
79185 "Knight and Day" 2010 "Action|Comedy|Romance" 1013743 3.41667 6
27773 "Old Boy" 2003 "Mystery|Thriller" 364569 4.08974 39
2067 "Doctor Zhivago" 1965 "Drama|Romance|War" 59113 4.14286 21
175435 "The Magic Ring" 1982 "Animation|Fantasy" 189195 4.5 1
2068 "Fanny and Alexander (Fanny och Alexander)" 1982 "Drama|Fantasy|Mystery" 83922 2.75 2
2069 "Trip to Bountiful, The" 1985 "Drama" 90203 4.25 2
8492 "Christmas Carol, A (Scrooge)" 1951 "Drama|Fantasy" 44008 3.25 2
2071 "And the Band Played On" 1993 "Drama" 106273 3.25 2
8493 "Memphis Belle" 1990 "Action|Drama|War" 100133 3.08333 6
27778 "Ginger Snaps Back: The Beginning" 2004 "Fantasy|Horror" 365265 3 1
2072 "'burbs, The" 1989 "Comedy" 96734 3.17647 17
54004 "I Now Pronounce You Chuck and Larry" 2007 "Comedy|Romance" 762107 3.45455 11
8500 "Godzilla vs. Mechagodzilla (Gojira tai Mekagojira)" 1974 "Action|Horror|Sci-Fi" 71565 2.5 1
157296 "Finding Dory" 2016 "Adventure|Animation|Comedy" 2277860 3.57692 13
3060 "Commitments, The" 1991 "Comedy|Drama|Musical" 101605 3.86667 15
2950 "Blue Lagoon, The" 1980 "Adventure|Drama|Romance" 80453 2.46429 14
131480 "Poker Night" 2014 "Action|Crime|Thriller" 2548208 2 1
2983 "Ipcress File, The" 1965 "Thriller" 59319 4 1
```

```
8969 "Bridget Jones: The Edge of Reason" 2004 "Comedy|Drama|Romance" 317198 3.025 20
2548 "Rage: Carrie 2, The" 1999 "Horror" 144814 1.83333 6
112171 "Equalizer, The" 2014 "Action|Crime|Thriller" 455944 3.27778 9
189333 "Mission: Impossible - Fallout" 2018 "Action|Adventure|Thriller" 4912910 3.75 2
47950 "Hollywoodland" 2006 "Crime|Drama|Mystery|Thriller" 427969 3.2 5
60803 "Little Drummer Boy, The" 1968 "Animation|Children|Musical" 63230 2.5 1
41573 "Family Stone, The" 2005 "Comedy|Drama|Romance" 356680 2.875 8
3014 "Bustin' Loose" 1981 "Comedy" 82121 2 1
86487 "Mildred Pierce" 2011 "Drama" 1492030 4.5 1
2550 "Haunting, The" 1963 "Horror|Thriller" 57129 4 7
8973 "Bad Education (La mala educación)" 2004 "Drama|Thriller" 275491 3.75 8
2552 "My Boyfriend's Back" 1993 "Comedy" 107626 1.5 2
3308 "Flamingo Kid, The" 1984 "Comedy|Drama" 87265 2.85714 7
118985 "Big Eyes" 2014 "Drama" 1126590 3.75 2
86880 "Pirates of the Caribbean: On Stranger Tides" 2011 "Action|Adventure|Fantasy|IMAX" 1298650 3.22917 24
2474 "Color of Money, The" 1986 "Drama" 90863 3.5 13
79592 "Other Guys, The" 2010 "Action|Comedy" 1386588 3.2619 21
2540 "Corruptor, The" 1999 "Action|Crime|Drama|Thriller" 142192 2.5 3
111785 "Midnight Chronicles" 2009 "Action|Adventure|Fantasy" 1079372 0.5 1
8961 "Incredibles, The" 2004 "Action|Adventure|Animation|Children|Comedy" 317705 3.836 125
8910 "I Heart Huckabees" 2004 "Comedy" 356721 3.45238 21
86028 "Henry's Crime" 2010 "Comedy|Crime" 1220888 2 1
2555 "Baby Geniuses" 1999 "Comedy" 118665 1.66667 3
2563 "Dangerous Beauty" 1998 "Drama" 118892 4.16667 3
8984 "Ocean's Twelve" 2004 "Action|Crime|Thriller" 349903 3.2907 43
152079 "London Has Fallen" 2016 "Action|Crime|Thriller" 3300542 2 2
87869 "Horrible Bosses" 2011 "Comedy|Crime" 1499658 3.4375 24
177763 "Murder on the Orient Express" 2017 "Crime|Drama|Mystery" 3402236 2.83333 3
8982 "I Am David" 2003 "Drama" 327919 3 3
2561 "True Crime" 1999 "Crime|Thriller" 139668 2.75 4
3268 "Stop! Or My Mom Will Shoot" 1992 "Action|Comedy" 105477 1.77273 11
170357 "Dave Chappelle: The Age of Spin" 2017 "Comedy" 6648926 4 1
3345 "Charlie, the Lonesome Cougar" 1967 "Adventure|Children" 62793 3 1
80463 "Social Network, The" 2010 "Drama" 1285016 3.88596 57
2567 "EDtv" 1999 "Comedy" 131369 2.97368 19
131098 "Saving Santa" 2013 "Animation|Children|Comedy" 2204315 5 1
2568 "Mod Squad, The" 1999 "Action|Crime" 120757 3.1875 8
2570 "Walk on the Moon, A" 1999 "Drama|Romance" 120613 3.2 5
79695 "Expendables, The" 2010 "Action|Adventure|Thriller" 1320253 3.05882 17
2577 "Metroland" 1997 "Comedy|Drama" 119665 3 1
8998 "That's Entertainment" 1974 "Documentary" 72272 4 1
2446 "In Dreams" 1999 "Horror|Thriller" 120710 2 2
130976 "Legend No. 17" 2013 "Drama" 2182001 4.5 1
60389 "Battle for Haditha" 2007 "War" 870211 4 1
8977 "Alexander" 2004 "Action|Adventure|Drama|War" 346491 2.2 10
```