Lab10: HashMap, Set, File Input, and a bit of Exception

Databases play important roles in the advancement of computer and information technology. Efficient storage and retrieval of data enable development and usage of a wide range of data-oriented applications. In this lab, you will be implementing a simple movie database that reads in a list of movies from a text file and stores them in a HashMap from which they can be looked up using movie ids. Your task is simply to fill in the missing code in `SimpleMovieDatabase`. You may use commons-io-2.6.jar to facilitate interaction with files.

public void importMovies(String movieFilename): Import the file "movieFilename" that contains a list of movies. For each "valid" line, the format is:

`<mid>,<title>,<tag1>|<tag2>|…|<tagN>`

A movie ID is a positive integer, a title and each tag are both strings. Furthermore, a valid movie must have complete information – for example, a movie title cannot be empty. If a line in the input file does not follow such rules and formats, just ignore it. The movie metadata must be stored in **public** Map<Integer, Movie> movies.

Expected output:

```
Done importing 48 movies
Retrieving movie ID 139747: [mid: 139747:Before We Go [Romance]]
Retrieving movie ID 141432: [mid: 141432:Sweet Red Bean Paste [Drama]]
Retrieving movie ID 139415: [mid: 139415:Irrational Man [Drama]]
Retrieving movie ID 139620: [mid: 139620:Everything's Gonna Be Great [Adventure, Drama,
Comedy, Children]]
Retrieving movie ID 141305: [mid: 141305:Round Trip to Heaven [(no genres listed)]]
```

Challenge Bonus (Optional):

An important part of a database is the ability to retrieve desired information. Implement the following methods:

public List<Movie> searchMovies(String query): Return a list of movies each of whose title contains "query". The search is case *insensitive*. If there are no matches, simply return an empty list.

public List<Movie> getMoviesByTag(String tag): Return a list of movies that fall into the category "tag". If there are no movies in such a category, simply return an empty list.

Expected output:

```
Results for movies that match: america
       [mid: 86290:American: The Bill Hicks Story [Documentary, Comedy]]
       [mid: 140711:American Ultra [Action, Comedy]]
       [mid: 39398:C.S.A.: The Confederate States of America [Drama, Comedy]]
       [mid: 114662:American Sniper [Action, War]]

Results for movies that match: thai
       [mid: 27801:Ong-Bak: The Thai Warrior (Ong Bak) [Action, Thriller]]

Results for movies that match: thailand

Results for movies in category: Musical

Results for movies in category: Action
       [mid: 140737:The Lost Room [Action, Fantasy, Mystery]]
       [mid: 143882:Operator [Action, Drama, Thriller]]
       [mid: 139920:Women of the Prehistoric Planet [Action, Sci-Fi, Adventure]]
       [mid: 142550:Ryuzo and the Seven Henchmen [Action, Comedy]]
       [mid: 27801:Ong-Bak: The Thai Warrior (Ong Bak) [Action, Thriller]]
       [mid: 140711:American Ultra [Action, Comedy]]
       [mid: 114662:American Sniper [Action, War]]
       [mid: 139642:Southpaw [Action, Drama]]

Results for movies in category: Thriller
       [mid: 143882:Operator [Action, Drama, Thriller]]
       [mid: 27801:Ong-Bak: The Thai Warrior (Ong Bak) [Action, Thriller]]
       [mid: 142488:Spotlight [Thriller]]
       [mid: 143385:Bridge of Spies [Drama, Thriller]]
       [mid: 142448:Everest [Adventure, Drama, Thriller]]
       [mid: 140725:Cop Car [Thriller]]
       [mid: 142074:Knock Knock [Horror, Thriller]]
       [mid: 141688:Legend [Thriller, Crime]]
```

Peer Bonus (Optional):

Sticker Here   Sticker Here   Sticker Here