# Computer Project #06

This assignment focuses on the design, implementation, and testing of a Python program that uses lists and tuples.

It is worth 60 points (6% of course grade) and must be completed no later than **11:59 PM on Monday 3/20, 2023.** After the due date, your score will be deducted by 1point for every 1 hour late or fraction of it for up to 24 hours. **Note that you must click on the "Submit" button to stop the counter. Otherwise, it will not be considered as submitted.**

## Assignment Overview

In this assignment, you will practice with lists of lists and tuples and write a program to answer the questions described below. **The only advanced data structures allowed to be used in this project are Lists and Tuples.**

## Assignment Background

In this assignment, you will practice with book data from a website called Goodreads. Goodreads has thousands of books uploaded to its website, allowing a user to save books to virtual bookshelves to track what they've read. When a user adds books to a bookshelf or leaves a review, Goodreads recommends related books. For this assignment, you will read in a user's criteria and provide book recommendations to them.

The data is provided in a file:
   1) `books.csv`: Each line has the five attributes of a character, comma-separated

```
isbn13, isbn10, title, subtitle, authors, categories, thumbnail, description,
published_year, average_rating, num_pages, ratings_count
```

You will create a list of tuples with only these attributes:
```
     (isbn13, title, authors, categories, description, published_year,
average_rating, num_pages)
```

## Assignment Specifications
You will develop a Python program that has the following functions

## open_file () → file pointer fp:
   a.  This function prompts the user to input a file name, then open it and keeps prompting until a valid name is entered. Return the file pointer. Use try-except to determine if the file can be opened. Check the `strings.txt` file for the appropriate strings to use in the prompt and error message to match the tests. When opening the file, you need to use `encoding="utf-8"`. For example,
```
          fp = open("data_small.csv", "r", encoding="utf-8")
```
   b.  Parameters: none
   c.  Returns: a file pointer
   d.  Display: prompts and error messages

## read_file (fp) → list of tuples:
        This function reads the comma-separated value (`csv`) file using file pointer `fp` and returns the list of tuples.
   a.  The file has one header line that you need to skip.  Create a list of tuples. Each tuple represents a book and has the following format:
```
     (isbn13, title, authors, categories, description, year, rating, num_pages,
   rating_count)
```

The type of each element in the tuple:
```
(string, string, string, list(lowercase strings), string, string, float,
int, int)
```
If any conversion fails, skip that line of data.
Hint: wrap the variable assignment in a try-except
  b. Parameter: `file pointer`
  c. Returns: `list of tuples`
  d. Displays: nothing

## def get_books_by_criterion (list of tuples, criterion, value) → list/tuple

  a. Given a list of book tuples, retrieve the books that match a certain `criterion`. If there is a problem with a `value` or `criterion` parameter, don't add the book to the return list—return an empty list.
  The `criterion` parameter is an `int` that represents the index of a criterion in a book tuple. For example, if filtering by `TITLE`, `criterion` should be 1; if filtering by `YEAR`, `criterion` should be 5, etc (*Hint:* use provided constants for the parameter `criterion`). No error checking for criterion and values is needed. Error checking will be done in the `main()` function.
  Note:
  
  I.   If you are searching by `TITLE`, only return the tuple of the book with that title. Do not put it in a list. variations in case are accepted.
  II.  For `CATEGORY`, `value` must be a `string` and variations in case are accepted, e.g. `'Fiction'`, `'FICTION'`, `'FiCTion'` and similar will match. If not, do not add the book to the return list.
  III. For `YEAR`, `value` is a `string`. The returned books should be published during the given `value`.
  IV.  For `RATING`, `value` is a `float` number. The returned books should have rating greater than or equal to the given `value`.
  V.   For `PAGES`, `value` should be an `integer`. Books included should have a page number within 50 pages of this number inclusive. For example, if the `value` is 137, books included will have page numbers between 87 and 187, including those numbers.
  b. parameter: `list of tuples, int, int/float/string`
  c. Returns: `list of tuples,` or `one tuple (TITLE)`
  d. Display: nothing

## def get_books_by_criteria (list of tuples, category, rating, page)→ list of tuples :

This function looks similar to the `get_books_by_criterion` function; the difference is that this function calls `get_books_by_criterion` *three* times, one for each of category, rating, and page number specified to select books based on all three criteria in that order (category, rating, then page number). The three calls effectively filter for each by passing the returned list of one function as an argument to the next call. Note that the parameters in this function for `category, rating,` and `page` number become the `value` arguments for the three respective calls to `get_books_by_criterion`---the `criterion` argument is determined by this parameter's name. (*Hint:* use provided constants for the parameter `criterion` when calling `get_books_by_criterion`).
  a. Parameter: `list of tuples, string, float, int`
  b. Returns: `list of tuples`
  c. Display: nothing

## def get_books_by_keyword(list of tuples, keywords) → list:

  a. Given a list of book tuples, retrieve all books whose description contains any of the `keywords` value. Make sure to look in every description for every keyword in the list of `keywords` provided. If one keyword is found, add the book tuple to the return list and move to the next book to avoid double counting a book.
  b. Parameters: `list of tuples, list of strings`
  c. Returns: `list of tuples`
  d. Display: nothing

## def sort_authors (list_of_tuples, a_z) → list:

a. Given a list of book tuples, create a new list where the books are sorted by author name. The `a_z boolean` value determines if you should return the books in descending (when `a_z` is `False`) or ascending order (when `a_z` is `True`) based on author name. When there is a tie, you should keep the same order as it appears in the `list_of_tuples`. `a_z` should default to `True`. DO NOT modify the original `list_of_tuples`
   Hint: shallow vs deep copy of a list
b. Parameters: `list of tuples, boolean`
c. Return : `sorted list of tuples`
d. Display: nothing

## def recommend_books(list of tuples, keywords, category, rating, page_number, a_z) → list:

a. Given a list of book tuples, retrieve all books filtered by `category, rating, page number` criteria and whose description contains any of the `keywords`. Sort the returned list by author name. The `a_z boolean` value determines if you should return the books in descending or ascending order based on author name similar to `sort_authors()`.
b. Parameters: `list of tuples, list of strings,`
c. Returns: `list of tuples`
d. Display: nothing

## def display_books (list_of_tuples) → none:

a. Given a list of book tuples, display the books along with their information, using the formats provided as constants in `strings.txt`. Ignore a book if its title or its authors are longer than 35 characters.
   If `list_of_tuples` is empty, print `'Nothing to print.'`
b. Parameters: `list of tuples`
c. Return: nothing
d. Display: books attributes

## def get_option () → int:

a. Display a menu of options and prompt for input. Return the input if it is between 1-4 inclusive. Otherwise, it prints an error message and return `None`. Ask for the input in the function, this function does not take parameters.
b. Parameters: nothing
c. Return: `int`
d. Display: menu and error message

## main():

1. Call `open_file()` to open a CSV file for reading and get a file pointer for the input file.
2. Call `read_file()` to read the data and store it in a list of tuples.
3. Call `get_option()` to prompt the user for input.
4. Repeat Step 5 until the user chooses 4.
5. Based on the input option
   a. If option is 1, find a book with a title:
      i. Prompt for a book title.
      ii. Call one of the functions already written to get the information of the book from the list of books.
      iii. Display the book. (Hint: put the tuple of the title in a list before calling `display_books()`)
   b. If option is 2, filter books by a certain criterion:
      i. Prompt first for a *criterion;* re-prompt if it is not valid (an `integer` that is 3,5,6, or 7).
      ii. Then prompt for a *value*;
         if `criterion` is RATING or PAGES, convert value to a `float(RATING)` or `int (PAGES)`; re-prompt if it cannot be converted.

If `criterion` is `CATEGORY` or `YEAR`, continue with the rest of the steps.

    iii.    Call `get_books_by_criterion` to filter characters by a certain *criteria* with a *value*.

    iv.    Sort books using `sort_authors` in ascending order.

    v.    Display the first 30 books using `display_books`

c.  If option is 3, recommend a book based on certain criteria:

    i.    Prompt in this order for *category*, *rating, and page number;* reprompt if RATING is not a `float` or if PAGES is not an `int`.

    ii.    Ask for `a_z` input. If the input is 1, set `a_z` to `True`. For any other input, set `a_z` to `False`.

    iii.    Ask for a list of keywords, separated by a space.

    iv.    Call `recommend_books` to filter books by above category, rating, page number criteria and by keywords.

    v.    Display books using `display_books`

d.  If option is 4

    i.    Quit the program

## Assignment Notes and Hints

1.  The coding standard for CSE 231 is posted on the course website:

http://www.cse.msu.edu/~cse231/General/coding.standard.html

Items 1-9 of the Coding Standard will be enforced for this project.

2.  By default, `sorted` (or `sort`) will sort on the first item in a list or tuple.  To sort on other indices use `itemgetter`. First, remember to include the following at the top of your program:
`from operator import itemgetter`
Then you use the `key` argument in `sorted` (or `sort`).  The following sorts list L on index 3:
` L = sorted(L, `**`key=itemgetter(3)`**`)`

3. The program will produce reasonable and readable output, with appropriate labels for all values displayed.

4. We provide a `proj06.py` program for you to start with.

5. If you "hard code" answers, you will receive a grade of zero for the whole project. An example of hard coding is to simply print the result rather than calculating it and then printing the calculated the result.

6. In the test cases below, the output would not fit all on one line without shrinking the text further. You do not need to shrink the text, and the header should be one line, not two. Check the test cases in coding rooms if the ones below are confusing.

## Assignment Deliverable

The deliverable for this assignment is the following file:

    `proj06.py` – the source code for your Python program

Be sure to use the specified file name and to submit it for grading before the project deadline.

**Grading Rubric**

```
Computer Project #06                            Scoring Summary
General Requirements:
  ( 4 pts) Coding Standard 1-9
     (descriptive comments, function headers, mnemonic identifiers, format,
     etc...)

Implementation:
 ( 3 pts)  open_file function (manual grading)

 ( 4 pts)  read_file function

 ( 7 pts)  get_books_on_criterion function

 ( 4 pts)  get_books_by_criteria function

 ( 5 pts)  get_books_by_keyword function

 ( 3 pts)  sort_authors function

 ( 5 pts)  recommend_books function

 ( 4 pts)  display_books function

 ( 2 pts)  get_option function (manual grading)

 ( 2 pts)  Test 1

 ( 4 pts)  Test 2

 ( 4 pts)  Test 3

 ( 3 pts)  Test 4

 ( 4 pts)  Test 5

 ( 2 pts)  Test 6


Note: hard coding an answer earns zero points for the whole project
-10 points for not using main()
```

**Test 1**

```
Enter file name: books.csv

Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 4
```

**Test 2**

```
Enter file name: books.csv

Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 1
Input a book title: A Tale of Two Cities

Book Details:
ISBN-13        Title                      Authors          Year  Rating  Number Pages  Number Ratings
9780141439600  A Tale of Two Cities       Charles Dickens  2003  3.83    489           693045

Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 4
```

**Test 3**

```
Enter file name: books.csv


Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 2


Choose the following criteria
                (3) Category
                (5) Year Published
                (6) Average Rating (or higher)
                (7) Page Number (within 50 pages)
                Enter criteria number: 3


Enter value: Fiction

Book Details:
ISBN-13        Title                           Authors     Year  Rating  Number Pages  Number Ratings
9780141026282  The Epic of Gilgamesh                        2006  3.67    120           51735
9780141181226  One Flew Over the Cuckoo's Nest              1962  4.19    281           3859
9780385503952  Atonement                                    2001  3.89    351           1539
9780425198735  Blow Fly                                     2004  3.76    467           31269
9780451194862  Wizard and Glass                             1998  4.25    702           864
9780451210845  The Gunslinger                               2003  3.96    300           5740
```

```
9780515131093   Out of this World                                              2001  4.07  357       5915
9780812972122   The Mysterious Island                                          2004  4.10  723       28969
9780974935997   The Mind Parasites                                             2005  3.79  240       888
9781400078479   Love                                                           2005  3.73  224       7095
9781402728112   The Book of the Dragon                                         2005  4.18  144       357
9781585425495   Any Woman's Blues                                              2006  3.51  362       422
9780452281431   Beauty's Punishment           A. N. Roquelaure;Anne Rice       1984  3.62  233       21844
9780452156616   Sleeping Beauty Novels        A.N. Roquelaure                  1999  3.99  724       10728
9780553578973   Iron Fist                     Aaron Allston                    1998  4.03  320       7448
9780156030168   The Liberated Bride           Abraham B. Yehoshua;Hillel Halkin 2004  3.76  576      449
9781400054879   Angry Black White Boy         Adam Mansbach                    2005  3.55  352       607
9780743499484   The Dead Yard                 Adrian McKinty                   2006  4.12  364       1408
9780007121014   Taken at the Flood            Agatha Christie                  2002  3.71  352       8852
9780007151677   Endless Night                 Agatha Christie                  2002  3.77  303       12740
9780312970079   Black Coffee                  Agatha Christie                  1999  3.48  304       9592
9780312981662   Crooked House                 Agatha Christie                  2002  4.02  276       22176
9780425200452   Murder on the Orient Express  Agatha Christie                  2004  4.16  322       144452
9781579126230   Murder on the Orient Express  Agatha Christie                  1934  4.16  266       1475
9781579126247   The A.B.C. Murders            Agatha Christie                  1936  4.00  252       63488
9781579126254   Murder at the Vicarage        Agatha Christie                  2005  4.05  288       113459
9781579126261   The Body in the Library       Agatha Christie                  2006  3.85  191       43669
9781579126278   The Murder of Roger Ackroyd   Agatha Christie                  1926  4.23  288       93453
```

Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 2


Choose the following criteria
                (3) Category
                (5) Year Published
                (6) Average Rating (or higher)
                (7) Page Number (within 50 pages)
                Enter criteria number: 6


Enter value: 4.50


Book Details:
```
ISBN-13         Title                          Authors                          Year  Rating  Number Pages  Number Ratings
9780738511672   Middlesex Borough                                               2003  5.00    128           2
9780395883976   The Gettysburg Address         Abraham Lincoln                  1997  4.53    32            4967
9780141014081   Complete Maus                  Art Spiegelman                   2003  4.55    296           100212
9780851512280   The Valley of Vision           Arthur Bennett                   1975  4.53    223           8939
9780393059168   The New Annotated Sherlock Holmes Arthur Conan Doyle            2005  4.63    1878          1396
9780711983083   The Beatles years              Barry Miles;Keith Badman         2001  4.53    376           12
9780723257639   The World of Peter Rabbit      Beatrix Potter                   2006  4.63    1072          210
9780740748479   The Complete Calvin and Hobbes Bill Watterson                   2005  4.82    1456          31249
9780751504835   Something Under the Bed is Drooling Bill Watterson              1988  4.70    127           137
9780751517200   It's a Magical World           Bill Watterson                   1997  4.76    176           138
9780836217353   The Days Are Just Packed       Bill Watterson                   1993  4.69    176           20021
9780836217698   Homicidal Psycho Jungle Cat    Bill Watterson                   1994  4.72    176           14952
9780836218053   The Essential Calvin And Hobbes Bill Watterson                  1988  4.64    256           102955
9780836221367   It's a Magical World           Bill Watterson                   1996  4.76    176           23336
9780618391004   The Lord of the Rings          Chris Smith                      2003  4.53    218           18934
9780618391028   JRR Tolkien Companion & Guide  Christina Scull;Wayne G. Hammond 2006  4.53    1002          37
9781551052700   Ecuador Nature Guide           Christopher D. Jiggins           2000  5.00    96            1
9780310249870   Fanning the Flame              Christopher J. H. Wright         2003  5.00    336           1
9780756616342   Animal                         David Burnie;Don E. Wilson       2005  4.52    624           551
9781883477370   Nineteen Sixty Eight           David Charles Hoeh               2000  4.50    246           2
```


Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 2


Choose the following criteria
                (3) Category
                (5) Year Published
                (6) Average Rating (or higher)

```
        (7) Page Number (within 50 pages)
        Enter criteria number: 5



Enter value: 2001


Book Details:
ISBN-13        Title                              Authors                         Year  Rating  Number Pages  Number Ratings
9780192751164  Tales of the Norse Gods                                            2001  4.07    160           40
9780385503952  Atonement                                                          2001  3.89    351           1539
9780515131093  Out of this World                                                  2001  4.07    357           5915
9780375758232  Paris to the Moon                  Adam Gopnik                      2001  3.76    368           12094
9780007111503  Partners in Crime                  Agatha Christie                 2001  3.77    347           9506
9780007113804  Murder in Mesopotamia              Agatha Christie                 2001  3.89    264           25692
9780007119332  Death in the Clouds                Agatha Christie                 2001  3.80    333           21123
9780007119356  Appointment with Death             Agatha Christie                 2001  3.86    303           24859
9780007120680  Hallve'en Party                    Agatha Christie                 2001  3.66    336           18820
9780007120697  Hercule Poirot's Christmas         Agatha Christie                 2001  3.93    335           23113
9780007122585  The Secret of Chimneys             Agatha Christie                 2001  3.86    400           11110
9780385492249  An Invisible Sign of My Own        Aimee Bender                    2001  3.68    256           3624
9780345418685  Reunion                            Alan Dean Foster                2001  3.87    352           1339
9781564781314  Point Counter Point                Aldous Huxley                   2001  3.85    432           9227
9781566633949  Complete Essays                    Aldous Huxley                   2001  4.33    416           6
9780226424156  The Collaborator                   Alice Kaplan                    2001  3.84    308           67
9780375707490  Lives of Girls and Women           Alice Munro                     2001  3.99    277           8085
9780440228844  Demon in My View                   Amelia Atwater-Rhodes           2001  4.04    192           10803
9780006550433  The Bonesetter's Daughter          Amy Tan                         2001  3.98    352           414
9780689846175  Sagwa, The Chinese Siamese Cat     Amy Tan                         2001  4.02    40            967
9780141183718  A Spy In The House Of Love         Anais Nin                       2001  3.68    124           290
9780743202558  New Jewish Wedding, Revised        Anita Diamant                   2001  3.96    288           678
9780451203267  The Stranger Beside Me             Ann Rule                        2001  4.14    550           47930
9781582791807  Agnes Grey                         Anne Brontë                     2001  3.68    190           37
9780859653237  Blink-182                          Anne Hoppus                     2001  4.41    112           61
9780439178822  The Pen is Mightier Than the Sword Anne Mazer                      2001  3.96    128           1063



Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 2



Choose the following criteria
                (3) Category
                (5) Year Published
                (6) Average Rating (or higher)
                (7) Page Number (within 50 pages)
                Enter criteria number: 7



Enter value: 87


Book Details:
ISBN-13        Title                                 Authors                         Year  Rating  Number Pages  Number Ratings
9780140509786  Burt Dow, Deep-Water Man                                              1989  4.10    64            645
9780141026282  The Epic of Gilgamesh                                                 2006  3.67    120           51735
9780375802430  Flap Your Wings                                                       2000  4.24    48            1228
9780375822971  Big Dog ... Little Dog                                                2003  4.11    48            86
9780394800837  McElligot's Pool                                                      1974  4.07    64            4403
9780394800912  Dr. Seuss's Sleep Book                                                1962  4.17    58            8683
9780573605734  Breakfast of Champions                                               1984  4.00    106           15
9780679406839  Gift from the Sea                                                     1991  4.17    132           1314
9780738511672  Middlesex Borough                                                    2003  5.00    128           2
9780751363784  The Three Musketeers                                                 2000  4.07    64            56
9780762404780  Irish Blessings                                                      1999  4.13    128           28
9780763631604  Beauty and the Beast                                                 2006  4.36    64            3609
9780785118954  Supreme Power                                                        2006  3.42    120           223
9780794503291  Gulliver's Travels                                                   2003  3.34    64            13
9780762408283  The Mini Zen Gardening Kit            Abd Al-Hayy Moore               2000  3.21    40            13
9780152057664  Frankenstein Makes a Sandwich         Adam Rex                        2006  4.21    40            1860
9780764537158  CliffsNotes On Joyce's Dubliners      Adam Sexton                     2003  3.50    80            4
9781887953795  Legend of the Five Rings              Aeg                             2003  3.68    96            44
9781559362108  A Tempest                             Aimé Césaire;Richard Miller     2002  3.55    69            1309
9780679420262  The Stranger                          Albert Camus;Matthew Ward       1993  3.97    117           1041
9781400095087  The Finer Points of Sausage Dogs      Alexander McCall Smith          2003  3.69    128           4724
9781557046864  The Sideways Guide to Wine and Life   Alexander Payne;Jim Taylor      2005  4.43    64            7
9781562549428  The Three Musketeers                  Alexandre Dumas                 2010  3.56    61            9
9780231085076  Discovering Plato                     Alexandre Koyre                 1960  3.26    118           7
9780689716041  The Bears on Hemlock Mountain         Alice Dalgliesh                 1992  3.78    64            2017
```

```
Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 4
```

**Test 4**
```
Enter file name: books.csv


Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 3


Enter the desired category: fiction

Enter the desired rating: 2.00

Enter the desired page number: 200

Enter 1 for A-Z sorting, and 2 for Z-A sorting: 1

Enter keywords (space separated): happy life


Book Details:
ISBN-13         Title                              Authors                          Year   Rating  Number Pages    Number Ratings
9781400078479   Love                                                                2005   3.73    224             7095
9781933110455   Carly's Sound                      Ali Vali                         2006   4.21    212             441
9780879239480   Broken Vessels                     Andre Dubus                      1992   4.32    195             348
9780020360759   Heart Songs and Other Stories      Annie Proulx                     1995   3.93    203             1822
9780061131271   Factotum tie-in                    Charles Bukowski                 2006   3.96    208             395
9780876851388   Mockingbird Wish Me Luck           Charles Bukowski                 2002   4.13    160             1769
9780844667508   Child of God                       Cormac McCarthy                  1994   3.86    197             57
9780374530303   Martin and John                    Dale Peck                        2006   3.73    248             694
9780679732549   Shoot the Piano Player             David Goodis                     1990   4.02    158             2691
9781852426743   Of Tender Sin                      David Goodis                     1952   3.69    181             143
9780843943993   Mountain Madness                   David Thompson                   1998   4.48    170             21
9780486424545   Howards End                        E. M. Forster                    2002   3.96    246             54709
9781400034291   The Dew Breaker                     Edwidge Danticat                 2005   3.79    244             5664
9781555837235   Stir-fry                           Emma Donoghue                    1994   3.58    240             1521
9780020199854   The Love of the Last Tycoon        F. Scott Fitzgerald              1994   3.65    169             6836
9780684804422   The Pat Hobby Stories              F. Scott Fitzgerald              1995   3.58    192             889
9780156030489   Kiffe Kiffe Tomorrow               Faïza Guène;Sarah Adams          2006   3.38    179             1026
9781400043330   The General in His Labyrinth       Gabriel García Márquez           2004   3.68    248             11460
9781840681123   Divine Filth                       Georges Bataille                 2004   3.93    160             74
9781567921588   W, Or, The Memory of Childhood     Georges Perec                    2003   3.88    176             1395
9781590171943   The Strangers in the House         Georges Simenon                  2006   3.76    194             633
9780671019099   The Tenth Man                      Graham Greene                    1998   3.72    160             2769
9780451205551   Trauma                             Graham Masterton                 2002   3.54    224             333
9780684856476   The Rum Diary                      Hunter S. Thompson               1999   3.82    224             43921
9780374500528   Gimpel the Fool and Other Stories  Isaac Bashevis Singer            1988   4.16    205             36
9780142002001   Youth                              J. M. Coetzee                    2003   3.79    176             4722
9780316769488   The Catcher in the Rye             J.D. Salinger                    1991   3.80    234             18849
9780060594527   Lost Horizon                       James Hilton                     2004   3.92    241             11794
9780312321208   P.S. Your Cat Is Dead              James Kirkwood                   2003   3.75    218             1291
9780446518628   The Celestine Prophecy             James Redfield                   1994   3.63    247             1280
9780312890216   The Starry Rift                    James Tiptree                    1994   3.82    250             220
9780156631402   Mrs. Miniver                       Jan Struther                     1990   3.96    162             1040
9780060598846   Love Overboard                     Janet Evanovich                  2005   3.65    244             11223
9780060598853   Back to the Bedroom                Janet Evanovich                  2005   3.67    234             9839
9780060598891   The Rocky Road to Romance          Janet Evanovich                  2004   3.67    249             9470
9781582344720   Soldiers of Salamis                Javier Cercas;Anne McLean        2005   3.79    213             398
9780679744474   Written on the Body                Jeanette Winterson               1994   4.07    192             20182
9780345468031   The Franklin Affair                Jim Lehrer                       2006   3.12    208             141
9781891620416   White Widow                        Jim Lehrer                       2000   3.01    224             174
9780374529949   Play It As It Lays                 Joan Didion                      2005   3.87    231             21868
9781400097029   The Sea                            John Banville                    2006   3.51    195             18513
9780373792733   The Perfect Score                  Julie Kenner                     2006   3.25    240             108
9780375726514   The Box Man                        Kōbō Abe                         2001   3.65    178             3293
9781932234299   Birthday                           Kōji Suzuki;Glynne Walley        2006   3.68    216             837
9780446607131   Death of a Gossip                  M. C. Beaton                     1999   3.72    179             9244
9780446609197   A Highland Christmas               M. C. Beaton                     2002   3.86    160             3455
9780553409680   Death of a Snob                    M. C. Beaton                     1996   3.78    192             17
9780394743042   The Ravishing of Lol Stein         Marguerite Duras                 1986   3.67    181             1939
9780002005883   Gilead                             Marilynne Robinson               2004   3.85    247             361
9780312288013   Serious Girls                      Maxine Swann                     2004   3.19    240             202
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9780743281591   Diary of a Mistress                Miasha                       2006  4.35  182  2449
9780060928414   Slowness                           Milan Kundera                1997  3.66  156  9454
9780226204192   Bengal Nights                      Mircea Eliade                1995  3.93  184  245
9780375704437   For the relief of unbearable urges Nathan Englander             2000  3.94  205  2344
9780385721912   Man Walks Into a Room              Nicole Krauss                2003  3.33  248  5322
9781557424297   The Picture of Dorian Gray         Oscar Wilde                  2005  4.07  187  329
9781426423703   The Adventures of Sally            P. G. Wodehouse              2007  3.78  232  10
9780060527990   The Devil and Miss Prym            Paulo Coelho                 2006  3.60  205  46113
9780060887964   The Alchemist - Gift Edition       Paulo Coelho                 2006  3.85  192  814
9780061122415   The Alchemist                      Paulo Coelho                 2006  3.85  197  1592632
9780061124266   Veronika Decides to Die            Paulo Coelho                 2006  3.70  210  126224
9780062513342   The Valkyries                      Paulo Coelho                 1996  3.31  212  696
9780099742005   Total Recall                       Piers Anthony                1990  3.93  224  7932
9780060777333   The Cat's Pajamas                  Ray Bradbury                 2005  3.73  234  1316
9780679723691   Cathedral                          Raymond Carver               1989  4.29  230  21140
9780618710508   The Diezmo                         Rick Bass                    2006  3.46  224  11
9780446614160   Words of Silk                      Sandra Brown                 2005  3.55  224  2600
9780553297836   A Whole New Light                  Sandra Brown                 1992  3.55  227  2817
9781551666723   The Thrill of Victory              Sandra Brown                 2003  3.60  240  1051
9781599982939   Naughty Little Secret              Shelley Bradley              2006  3.73  212  2270
9780312422738   A Feather on the Breath of God     Sigrid Nunez                 2005  3.87  192  447
9780671001957   Pieces                             Stephen Chbosky              2000  3.52  155  1087
9780446390576   Bare Bones                         Stephen King;Tim Underwood   1989  4.16  224  3050
9780385316576   Follow Your Heart                  Susanna Tamaro               1995  3.57  208  3170
9780765351548   Debt of Bones                      Terry Goodkind               2004  3.86  160  25701
9780571207992   The Wars                           Timothy Findley              2001  3.87  218  6229
9780151009985   Mrs. Dalloway                      Virginia Woolf               2002  3.79  194  167000
9780156628709   Mrs. Dalloway                      Virginia Woolf               1981  3.79  197  7971
9780812972580   The Ox-Bow Incident                Walter Van Tilburg Clark     2004  3.82  247  4116
9780440362050   My Name is Aram                    William Saroyan              1966  4.15  151  975
9780061120060   Their Eyes Were Watching God       Zora Neale Hurston           2006  3.90  219  209110
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Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 4

## Test 5
Enter file name: book.csv

Error opening file. Please try again.
Enter file name: books.csv

Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 5

Invalid option

Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 2

Choose the following criteria
                (3) Category
                (5) Year Published
                (6) Average Rating (or higher)
                (7) Page Number (within 50 pages)
                Enter criteria number: 1

Invalid input

Choose the following criteria

```
              (3) Category
              (5) Year Published
              (6) Average Rating (or higher)
              (7) Page Number (within 50 pages)
              Enter criteria number: a


Invalid input

Choose the following criteria
              (3) Category
              (5) Year Published
              (6) Average Rating (or higher)
              (7) Page Number (within 50 pages)
              Enter criteria number: 6


Enter value: five


Invalid input

Enter value: 4.67


Book Details:
ISBN-13         Title                           Authors                         Year   Rating   Number Pages   Number Ratings
9780738511672   Middlesex Borough                                               2003   5.00     128            2
9780740748479   The Complete Calvin and Hobbes  Bill Watterson                  2005   4.82     1456           31249
9780751504835   Something Under the Bed is Drooling Bill Watterson              1988   4.70     127            137
9780751517200   It's a Magical World            Bill Watterson                  1997   4.76     176            138
9780836217353   The Days Are Just Packed        Bill Watterson                  1993   4.69     176            20021
9780836217698   Homicidal Psycho Jungle Cat     Bill Watterson                  1994   4.72     176            14952
9780836221367   It's a Magical World            Bill Watterson                  1996   4.76     176            23336
9781551052700   Ecuador Nature Guide            Christopher D. Jiggins          2000   5.00     96             1
9780310249870   Fanning the Flame               Christopher J. H. Wright        2003   5.00     336            1
9781932206081   Insights                        Frederick Lenz                  2003   5.00     304            1
9781931082884   Novels, 1901-1902               Henry James;Leo Bersani         2006   4.68     713            25
9780439682589   Harry Potter                    J. K. Rowling                   2004   4.78     2690           38872
9780439827607   The Harry Potter Collection     J. K. Rowling                   2005   4.73     3342           27410
9780312643065   The Price of the Ticket         James Baldwin                   1985   4.70     712            396
9780738539560   Lake Orion                      James E. Ingram;Lori Grove      2006   5.00     128            0
9781890995522   The Diamond Color Meditation    John Diamond                    2006   5.00     74             5
9780446578271   The Everyday Life Bible         Joyce Meyer                     2006   4.70     2208           1715
9780851621814   The Complete Theory Fun Factory Katie Elliott;Ian Martin        1996   5.00     96             1
9781930901353   The Irish Anatomist             Keith Donohue                   2002   5.00     222            1
9780310929550   Zondervan NIV Study Bible       Kenneth L. Barker;Donald W. Burdick 2002 4.70   2198           4092
9780809166589   Love You Until...               Lisa McCourt                    1999   4.67     32             3
9780567044716   Colossians and Philemon         Robert McL Wilson               2005   5.00     512            1


Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 2

Choose the following criteria
              (3) Category
              (5) Year Published
              (6) Average Rating (or higher)
              (7) Page Number (within 50 pages)
              Enter criteria number: 7


Enter value: one


Invalid input

Enter value: 1


Book Details:
ISBN-13         Title                           Authors                         Year   Rating   Number Pages   Number Ratings
9780375802430   Flap Your Wings                                                 2000   4.24     48             1228
9780375822971   Big Dog ... Little Dog                                          2003   4.11     48             86
9780679888093   The Little Butterfly                                           1998   4.06     24             16
9780698115675   The Legend of the Poinsettia                                    1997   4.19     32             2285
9780823408818   A Picture Book of Thomas Jefferson                             1991   3.72     32             14
9780823410781   A Picture Book of Anne Frank                                    1993   4.17     32             208
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9780859537285   Head, Shoulders, Knees and Toes ...                            2002  4.06  12   1083
9780762408283   The Mini Zen Gardening Kit          Abd Al-Hayy Moore          2000  3.21  40   13
9780395883976   The Gettysburg Address             Abraham Lincoln            1997  4.53  32   4967
9780749858520   Little Miss Scary                  Adam Hargreaves;Roger Hargreaves  2003  3.73  32   175
9780152057664   Frankenstein Makes a Sandwich      Adam Rex                   2006  4.21  40   1860
9780803729780   Time for Ballet                    Adèle Geras;Shelagh McNicholas  2004  3.71  32   68
9781845390105   Scary Edwin Page                   Alec Sillifant;Daniel Postgate  2004  3.21  24   14
9780689718762   The Fourth of July Story           Alice Dalgliesh            1995  4.00  32   242
9780689874093   I Love Saturdays y domingos        Alma Flor Ada              2004  4.03  32   33
9780689846175   Sagwa, The Chinese Siamese Cat     Amy Tan                    2001  4.02  40   967
9780590598873   Babysitters Club                   Ann M. Martin              1995  3.85  0    5241
9780486292724   Black Beauty Coloring Book         Anna Sewell;John Green     1996  4.25  48   68
9780413735904   A Clockwork Orange                 Anthony Burgess            1998  3.82  51   27
9780670915415   In the Shadow of No Towers         Art Spiegelman             2004  3.68  48   2818
9780140503449   Christmas in Noisy Village         Astrid Lindgren;Ilon Wikland  1981  4.18  32   797
9780804104555   The 13th directorate               Barry Chubin               1989  2.62  0    8
9780723258056   A Journal                          Beatrix Potter (Illustratorin)  2006  4.34  32   341
9780439781473   Fourth of July mice                Bethany Roberts            2005  3.23  32   1
9780956956161   The Meanest Thing to Say           Bill Cosby;Varnette P. Honeywood  1997  3.53  40   956
9780753459645   I Wonder Why the Sun Rises         Brenda Walpole             2006  3.95  32   50
9780753456101   I Wonder Why I Blink               Brigid Avison              2003  3.93  32   37
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Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 2


Choose the following criteria
                (3) Category
                (5) Year Published
                (6) Average Rating (or higher)
                (7) Page Number (within 50 pages)
                Enter criteria number: 3
Enter value: electro


Book Details:
Nothing to print.



Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 4
```

## Test 6
```
Enter file name: books.csv

Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 1


Input a book title: A Tale of Two Cities


Book Details:
ISBN-13         Title                               Authors
Year    Rating  Number Pages    Number Ratings
9780141439600   A Tale of Two Cities                Charles Dickens
2003    3.83    489             693045


Welcome to the Book Recommendation Engine
```

```
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 2


Choose the following criteria
                (3) Category
                (5) Year Published
                (6) Average Rating (or higher)
                (7) Page Number (within 50 pages)
                Enter criteria number: 3



Enter value: Fiction


Book Details:
ISBN-13         Title                           Authors                             Year    Rating  Number Pages    Number Ratings
9780141026282   The Epic of Gilgamesh                                               2006    3.67    120             51735
9780141181226   One Flew Over the Cuckoo's Nest                                     1962    4.19    281             3859
9780385503952   Atonement                                                          2001    3.89    351             1539
9780425198735   Blow Fly                                                           2004    3.76    467             31269
9780451194862   Wizard and Glass                                                   1998    4.25    702             864
9780451210845   The Gunslinger                                                     2003    3.96    300             5740
9780515131093   Out of this World                                                  2001    4.07    357             5915
9780812972122   The Mysterious Island                                              2004    4.10    723             28969
9780974935997   The Mind Parasites                                                 2005    3.79    240             888
9781400078479   Love                                                               2005    3.73    224             7095
9781402728112   The Book of the Dragon                                             2005    4.18    144             357
9781585425495   Any Woman's Blues                                                  2006    3.51    362             422
9780452281431   Beauty's Punishment               A. N. Roquelaure;Anne Rice       1984    3.62    233             21844
9780452156616   Sleeping Beauty Novels            A.N. Roquelaure                  1999    3.99    724             10728
9780553578973   Iron Fist                         Aaron Allston                    1998    4.03    320             7448
9780156030168   The Liberated Bride               Abraham B. Yehoshua;Hillel Halkin 2004   3.76    576             449
9781400054879   Angry Black White Boy             Adam Mansbach                    2005    3.55    352             607
9780743499484   The Dead Yard                     Adrian McKinty                   2006    4.12    364             1408
9780007121014   Taken at the Flood               Agatha Christie                   2002    3.71    352             8852
9780007151677   Endless Night                    Agatha Christie                   2002    3.77    303             12740
9780312970079   Black Coffee                     Agatha Christie                   1999    3.48    304             9592
9780312981662   Crooked House                    Agatha Christie                   2002    4.02    276             22176
9780425200452   Murder on the Orient Express     Agatha Christie                   2004    4.16    322             144452
9781579126230   Murder on the Orient Express     Agatha Christie                   1934    4.16    266             1475
9781579126247   The A.B.C. Murders               Agatha Christie                   1936    4.00    252             63488
9781579126254   Murder at the Vicarage           Agatha Christie                   2005    4.05    288             113459
9781579126261   The Body in the Library          Agatha Christie                   2006    3.85    191             43669
9781579126278   The Murder of Roger Ackroyd      Agatha Christie                   1926    4.23    288             93453


Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 3


Enter the desired category: fiction


Enter the desired rating: 4.00


Enter the desired page number: 500


Enter 1 for A-Z sorting, and 2 for Z-A sorting: 2


Enter keywords (space separated): happy life


Book Details:
ISBN-13         Title                           Authors                 Year    Rating  Number Pages    Number Ratings
9780671040840   The Living Blood                 Tananarive Due          2002    4.33    515             1777
9780743437493   The Shining                      Stephen King            2002    4.21    505             1283
9780375400704   Molloy                           Samuel Beckett          1997    4.28    512             6612
9780679724773   I, Claudius                      Robert Graves           1989    4.27    468             43469
9780679729914   The Best of Roald Dahl           Roald Dahl              1990    4.38    520             6067
9780060572976   The Good, the Bad, and the Undead Kim Harrison           2005    4.26    453             53112
9780765345905   Wolfskin                         Juliet Marillier        2004    4.00    544             5531
9780756403454   Regeneration                     Julie E. Czerneda       2006    4.13    543             53
9780061150142   The Pact                         Jodi Picoult            2006    4.01    512             237587
9780679755487   The Death of Virgil              Hermann Broch           1995    4.19    496             756
9780802151803   Sexus                            Henry Miller            1987    4.04    506             7024
9780743292498   True Evil                        Greg Iles               2006    4.08    512             12524
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9780061120077   A Tree Grows in Brooklyn        Betty Smith                 2006   4.26   496          326733
9781400032921   The Complete Short Novels       Anton Pavlovich Chekhov     2005   4.47   548          10275
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Welcome to the Book Recommendation Engine
        Choose one of below options:
        1. Find a book with a title
        2. Filter books by a certain criteria
        3. Recommend a book
        4. Quit the program
        Enter option: 4