Movie recommendation system based on Top 250 movies

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1. Project code

Link: https://github.com/jingjie-wan/SI507
Please refer to the README file for more details

2. Data source

2.1 IMDb Top 250 Movies

The first data source is a webpage of the top-rated 250 movies in Internet Movie Database(IMDb).
Source: http://www.imdb.com/chart/top
Format: HTML
Access & Cache:

I accessed the data by scraping. I use **requests** library to make a HTTP request to the above URL. Then I use **BeautifulSoup** to parse and extract movie information from the response content.

I used cache so HTTP request to the website only have to be made once. To be more specific, I saved the text of the web response in a html file. If the file already exists locally, the program directly read the file.

Summary of Data:

- #Records available: 250
- #Records retrieved: 250
- Description:

  Every record contains basic information of one of the top 250 movies. Here are the important fields of each record:

  - The rank (of rating) of the movie (*place*)
  - The IMDB number of the movie, which is unique and Is used widely to identify movies in many databases (*IMDB_number*)
  - The title of the movie (*title*)
  - The rating of the movie on IMDB website (*rating*)
  - The year that the movie released (*year*)
  - The director of the movie (*direct*)
  - The main actors and actress (in list) (*stars*)

2.2 Open Movie Database

Since the first data source only provides limited information, I used the second database which contains detailed information about movies to complement the movie data. The two datasets can be merged by the IMDB number.
Source: https://www.omdbapi.com/
Format: JSON
Access & Cache:

I accessed the data by Web API which requires API key (http://www.omdbapi.com/?apikey=[yourkey]&). I used **requests** library again while I can only use IMDB number from the first database to make request to one movie's data at a time. I converted these json data to dictionary (which keys are the IMDB numbers of the movies).

To cache the data, I turned the dictionary containing data of each movies to json format and saved it as json file. If the program finds the file locally, it would directly read the file instead of making all the requests again.

Summary of Data:

- #Records available: About 1 million
- #Records retrieved: 250
- Description:

  Every record contains detailed information a movie, including runtime, awards, rated, genre and so on. Here are the important fields of each record:

  - The IMDB number of the movie (enable it to be merged with the first database to get complete information) (*IMDB_number*)
  - The runtime of the movie (*runtime*)
  - The genres of the movie (in list) (*genre*)
  - Languages and countries of the movie (in list) (*language*, *country*)
  - whether the film has been nominated oscar award (*nominated_oscar*)
  - Box office (in dollar) (*box_office*)

3. Data Structure

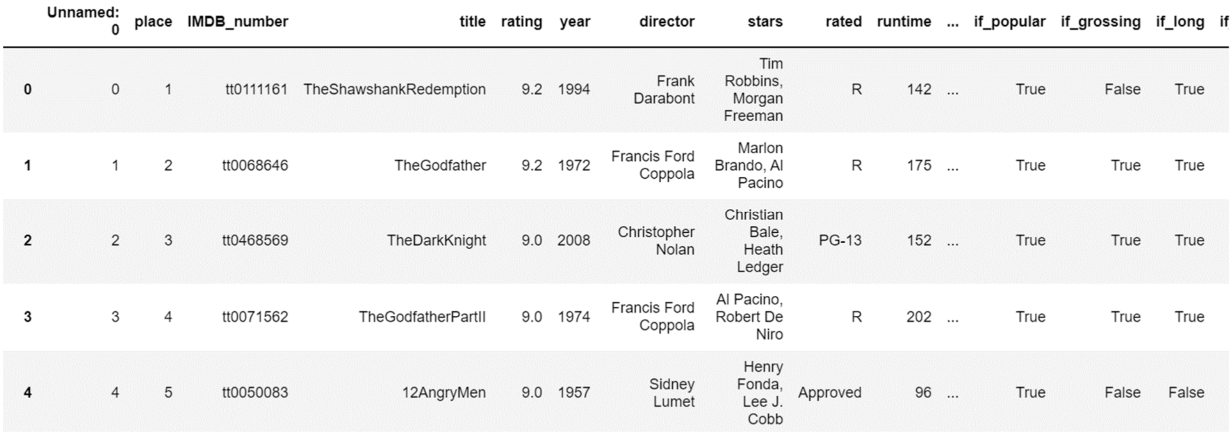
The data structure I used (tree) is described in detail in README file in the *code* folder.

Tree is saved in Tree.json.

Get_tree.py reads Tree.json and loads the tree.

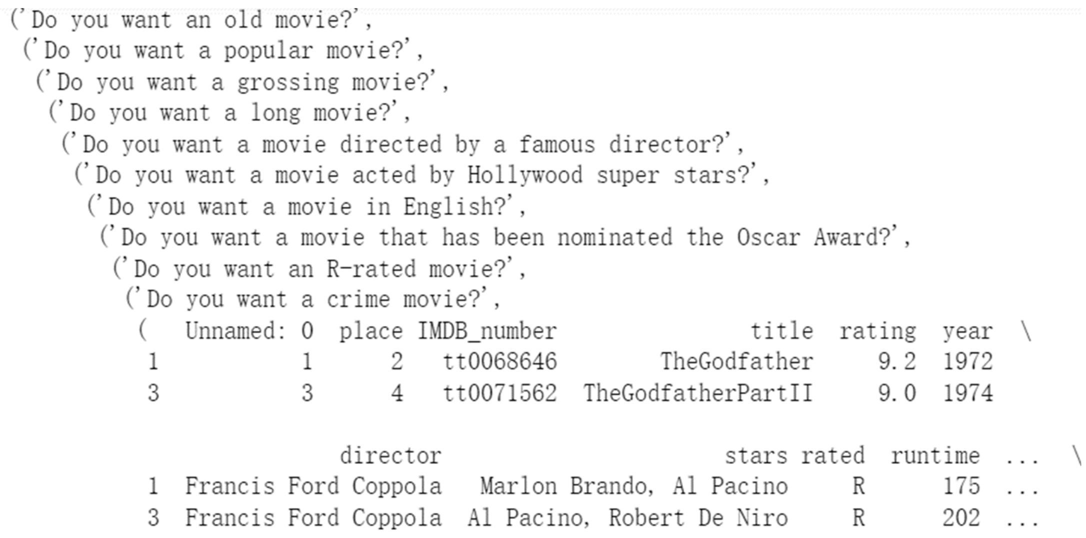
Screenshots:

- Data (the first several columns are information of movies, followed by columns of boolean used to construct the tree)



	Unnamed: 0	place	IMDB_number	title	rating	year	director	stars	rated	runtime	...	if_popular	if_grossing	if_long	if
0	0	1	tt0111161	TheShawshankRedemption	9.2	1994	Frank Darabont	Tim Robbins, Morgan Freeman	R	142	...	True	False	True	
1	1	2	tt0068646	TheGodfather	9.2	1972	Francis Ford Coppola	Marlon Brando, Al Pacino	R	175	...	True	True	True	
2	2	3	tt0468569	TheDarkKnight	9.0	2008	Christopher Nolan	Christian Bale, Heath Ledger	PG-13	152	...	True	True	True	
3	3	4	tt0071562	TheGodfatherPartII	9.0	1974	Francis Ford Coppola	Al Pacino, Robert De Niro	R	202	...	True	True	True	
4	4	5	tt0050083	12AngryMen	9.0	1957	Sidney Lumet	Henry Fonda, Lee J. Cobb	Approved	96	...	True	False	False	

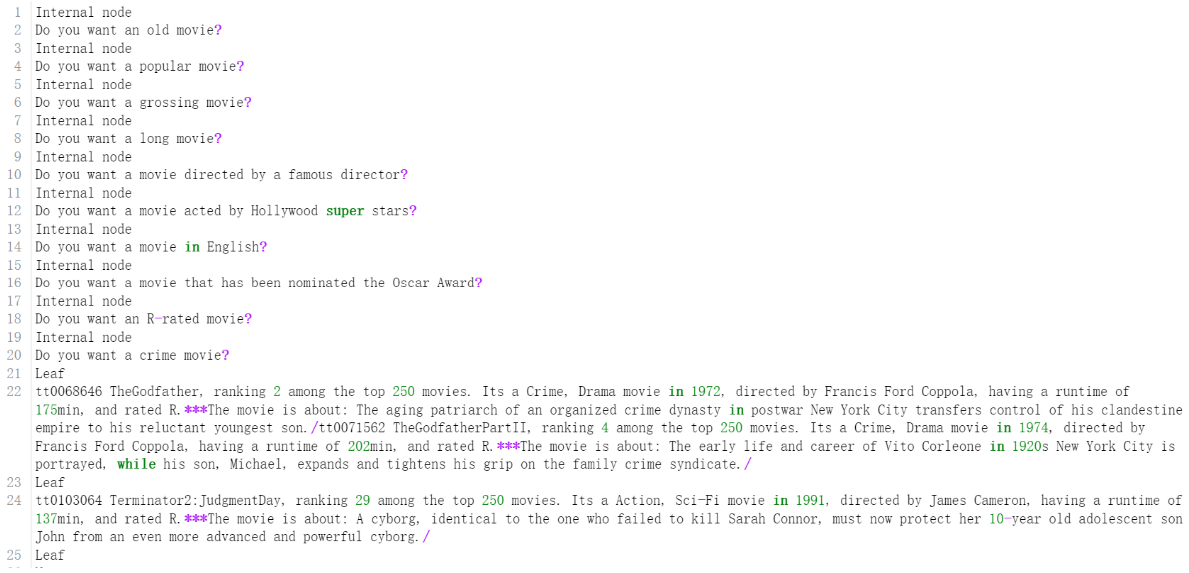
- Data structure:
  - Tree shown in tuple (part of)



```
('Do you want an old movie?',
 ('Do you want a popular movie?',
  ('Do you want a grossing movie?',
   ('Do you want a long movie?',
    ('Do you want a movie directed by a famous director?',
     ('Do you want a movie acted by Hollywood super stars?',
      ('Do you want a movie in English?',
       ('Do you want a movie that has been nominated the Oscar Award?',
        ('Do you want an R-rated movie?',
         ('Do you want a crime movie?',
          (   Unnamed: 0  place IMDB_number              title  rating  year  \
           1           1      2   tt0068646        TheGodfather     9.2  1972
           3           3      4   tt0071562  TheGodfatherPartII     9.0  1974

                       director                      stars rated  runtime  ...   \
           1  Francis Ford Coppola   Marlon Brando, Al Pacino     R      175  ...
           3  Francis Ford Coppola  Al Pacino, Robert De Niro     R      202  ...
```

- Tree shown in string (in json file) (part of)



```
Internal node
Do you want an old movie?
Internal node
Do you want a popular movie?
Internal node
Do you want a grossing movie?
Internal node
Do you want a long movie?
Internal node
Do you want a movie directed by a famous director?
Internal node
Do you want a movie acted by Hollywood super stars?
Internal node
Do you want a movie in English?
Internal node
Do you want a movie that has been nominated the Oscar Award?
Internal node
Do you want an R-rated movie?
Internal node
Do you want a crime movie?
Leaf
tt0068646 TheGodfather, ranking 2 among the top 250 movies. Its a Crime, Drama movie in 1972, directed by Francis Ford Coppola, having a runtime of 175min, and rated R.***The movie is about: The aging patriarch of an organized crime dynasty in postwar New York City transfers control of his clandestine empire to his reluctant youngest son./tt0071562 TheGodfatherPartII, ranking 4 among the top 250 movies. Its a Crime, Drama movie in 1974, directed by Francis Ford Coppola, having a runtime of 202min, and rated R.***The movie is about: The early life and career of Vito Corleone in 1920s New York City is portrayed, while his son, Michael, expands and tightens his grip on the family crime syndicate./
Leaf
tt0103064 Terminator2:JudgmentDay, ranking 29 among the top 250 movies. Its a Action, Sci-Fi movie in 1991, directed by James Cameron, having a runtime of 137min, and rated R.***The movie is about: A cyborg, identical to the one who failed to kill Sarah Connor, must now protect her 10-year old adolescent son John from an even more advanced and powerful cyborg./
Leaf
```

4. Interaction and Presentation Options

After answering a series of questions about the requirements for movies, the user will be given four options for displaying and selecting the recommended movies.

- Firstly, two options are given: (1) see the recommended movies in simple mode (just the titles); (2) in detailed mode (including their titles, places among 250 movies, genres, released year, directors, runtime, etc.)
- Next, another two options are given: (1) see the plot of a specific movie; (2) launching a browser which jumps to the IMDB website of a specific move.

and JSON file with your graphs or trees

I mainly used command line prompts for interaction and presentation. Launching a browser that jumps to a specific movie website is also used as a presentation method.

To interact with my program, the user should follow the instructions in the command lines. The user will answer 'yes' or 'no' to a series of questions about their requirements of the recommended movies (e.g. 'Do you want a popular movie?'). Then the user can enter a number (1 or 2) to choose the demonstration modes of the recommended movie list. Thirdly, the user can choose to see the plot or browse the website of a specific movie in the list by entering the number of the movie in the list. Finally, the user can choose whether to play with the recommendation system again.

5. Demo Link

https://drive.google.com/file/d/1aBT3LEaTNbjq9eoqgST4zsLVv_v2l3uP/view?usp=sharing
Note: Please change the clarity on the bottom right corner to 1080P to see the command lines! (The default clarity of google drive is 720P)