Assignment Weeks 9 & 10: Advanced Data Gathering and Visualization: Activity 9 & 10

''' Name : Karthikeyan Chellamuthu

Date : 05-22-2022 '''

'''Project Gutenberg encourages the creation and distribution of eBooks by encouraging volunteer efforts to digitize and archive cultural works. This activity aims to scrape the URL of Project Gutenberg's Top 100 eBooks to identify the eBooks' links. It uses BeautifulSoup4 to parse the HTML and regular expression code to identify the Top 100 eBook file numbers.'''

In [1]:
```
# 1. Data Wrangling with Python: Activity 9, page 294

# Import the necessary libraries required exercises.

import urllib.request, urllib.parse, urllib.error
import requests
from bs4 import BeautifulSoup
import ssl
import re
```

In [2]:
```
# SSL certificate this will ignore the errors due to SSL certificate

ctx = ssl.create_default_context()
ctx.check_hostname = False
ctx.verify_mode = ssl.CERT_NONE
```

In [3]:
```
# Reading HTML page from URL

url = 'https://www.gutenberg.org/browse/scores/top'
rspns = requests.get(url)
```

In [6]:
```
# Function to check the status of web request If the status code is 200 then print s

def status_check(r):
    if r.status_code==200:
        print("Status code is 200")
        print("Success Response!")
        return 1
    else:
        print("Status code is not 200")
        print("Failed Response!")
        return -1
```

In [8]:
```
# Calling status_check to see if our response is success or failed

status_check(rspns)
```

```
Status code is 200
Success Response!
```

Out[8]: 1

In [10]:
```
# BeautifulSoup processing for data parsing. Call this after checking the status of

html_data = rspns.content.decode(rspns.encoding)
soup = BeautifulSoup(html_data, 'html.parser')
```

In [13]:
```
# Find all href tags and store them in a list declaring empty list to hold all the h

href_links=[]

# Finding all the href tags and storing the corresponing links in the above defined

for link in soup.find_all('a'):
    href_links.append(link.get('href'))

# Printing the total number of links present in the web page

print("Total number of links present in the web page: {}".format(len(href_links)))

# Printing first 30 values from the list

href_links[:30]
```

Out[13]:
```
Total number of links present in the web page: 675
['/',
 '/about/',
 '/about/',
 '/policy/collection_development.html',
 '/about/contact_information.html',
 '/about/background/',
 '/policy/permission.html',
 '/policy/privacy_policy.html',
 '/policy/terms_of_use.html',
 '/ebooks/',
 '/ebooks/',
 '/ebooks/bookshelf/',
 '/browse/scores/top',
 '/ebooks/offline_catalogs.html',
 '/help/',
 '/help/',
 '/help/copyright.html',
 '/help/errata.html',
 '/help/file_formats.html',
 '/help/faq.html',
 '/policy/',
 '/help/public_domain_ebook_submission.html',
 '/help/submitting_your_own_work.html',
 '/help/mobile.html',
 '/attic/',
 '/donate/',
 '/donate/',
 '#books-last1',
 '#authors-last1',
 '#books-last7']
```

'''It appears that first 33 elements : index [0] - [32], in this list are not the indicators of the Top100 books. Actual book numbers start from 34th occurrence - index [33] onwards and Top100 books present prior to [133].'''

In [16]:
```
# Using regular expression to find the numeric digits from the links. These are file
```

```
# Declaring blank list to store the result
num_books = []

for i, book in enumerate(href_links[33:133]):       # enumerate function to bring ou
    book.strip()                                    # exlude spaces around the eleme
    num = re.findall('[0-9]+', book)                # regular expression to identify

    # when i checked, 'num' returned above retrieves a list of string, with each str

    if len(num) == 1:                               # validate only 1 element presen
        num_books.append(int(num[0]))               # load the numeric part of the b


# print the book_list prepared above to display the book / file numbers of Top100 bo

print("Below is the list of book / file numbers of the Top100 books from Gutenberg:"
print("="* 124)
print(num_books)
print("="* 124)
```

```
Below is the list of book / file numbers of the Top100 books from Gutenberg:
============================================================================================
========================================
[84, 1342, 25344, 64317, 11, 1661, 98, 2542, 1952, 1080, 174, 1400, 345, 2701, 1260,
4300, 408, 219, 844, 43, 76, 23, 67367, 1232, 46, 5200, 6130, 160, 2591, 2554, 1211
6, 67364, 205, 67368, 36853, 15399, 2600, 67370, 67365, 514, 1250, 74, 1727, 7370, 5
5, 1184, 1497, 768, 3207, 215, 2814, 67358, 829, 67366, 5740, 35, 67369, 996, 28054,
140, 135, 45, 203, 3600, 851, 4363, 120, 16, 16328, 36, 67363, 20203, 42324, 1934, 1
9942, 161, 2148, 61, 41, 30254, 26184, 600, 103, 3825, 2852, 2908, 58585, 43453, 11
3, 4217, 1399, 158, 1998, 3296, 1513, 863, 20228, 11030, 1597, 730]
============================================================================================
========================================
```

In [18]:

```
# Print first 2000 characters from the parsed_data using '.text' method parsed_data

print(soup.text[:2000])
```

```
Top 100 | Project Gutenberg
```

Menu▾

About
▾

▾

About Project Gutenberg
Collection Development
Contact Us
History & Philosophy
Permissions & License
Privacy Policy
Terms of Use

Search and Browse
▾

▾

Book Search
Bookshelves
Frequently Downloaded
Offline Catalogs

Help
▾

▾

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Errata, Fixes and Bug Reports
File Formats
Frequently Asked Questions
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```
Donation




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Top 100 EBooks yesterday
Top 100 Authors yesterday
Top 100 EBooks last 7 days
Top 100 Authors last 7 days
Top 100 EBooks last 30 days
Top 100 Authors last 30 days


Top 100 EBooks yesterday

Frankenstein; Or, The Modern Prometheus by Mary Wollstonecraft Shelley (2732)
Pride and Prejudice by Jane Austen (1802)
The Scarlet Letter by Nathaniel Hawthorne (840)
The Great Gatsby by F. Scott  Fitzgerald (827)
Alice's Adventures in Wonderland by Lewis Carroll (825)
The Adventures of Sherlock Holmes by Arthur Conan Doyle (766)
A Tale of Two Cities by Charles Dickens (742)
A Doll's House : a play by Henrik Ibsen (718)
The Yellow Wallpaper by Charlotte Perkins Gilman (717)
A Modest Proposal by Jonathan Swift (665)
The Picture of Dorian Gray by Oscar Wilde (639)
Great Expectations by Charles Dickens (614)
Dracula by Bram Stoker (588)
Moby Dick; Or, The Whale by Herman Melville (567)
Jane Eyre: An Autobiography by Charlotte Brontë (546)
Ulysses by James Joyce (522)
The Souls of Black Folk by W. E. B.  Du Bois (503)
Heart
```

In [19]:

```
# 10. , 11. and 12. Extract Top100 books from the yesterday's ranking, use splitline

# Looking at the textual representation of initial 8000 characters, I found out that
# Begins after two occurrences of text "Top 100 EBooks yesterday". After 2nd occurre

yest_top100_list = []

# Identify the first index location holding the first occurrence of "Top 100 EBooks

fst_idx = soup.text.splitlines().index('Top 100 EBooks yesterday')
```

```
print("First index for text 'Top 100 EBooks yesterday' is: {}".format(fst_idx))
```

```
First index for text 'Top 100 EBooks yesterday' is: 113
```

''' Looking at the printed data, we can see that there are 10 lines between line at 'fst_idx' and actual EBooks data '''

In [20]:
```
# Print about 11 occurrences in the parsed_data.text after splitlines() method is pe
# This will give us an idea where the first occurrence of the EBooks start

print(soup.text.splitlines()[113:124])
```

```
['Top 100 EBooks yesterday', 'Top 100 Authors yesterday', 'Top 100 EBooks last 7 day
s', 'Top 100 Authors last 7 days', 'Top 100 EBooks last 30 days', 'Top 100 Authors l
ast 30 days', '', '', 'Top 100 EBooks yesterday', '', 'Frankenstein; Or, The Modern
Prometheus by Mary Wollstonecraft Shelley (2732)']
```

'''Rather than using loop to extract the Top100 EBooks from yesterday, I have used a slice of the parsed_data which is more efficient.'''

In [21]:
```
# It appears, looking at above spliced section, the first occurrence of EBook is pre

yest_top100_list = soup.text.splitlines()[fst_idx+10:223]
```

In [22]:
```
# Print the list of "Top 100 EBooks yesterday"

print(yest_top100_list)
```

```
['Frankenstein; Or, The Modern Prometheus by Mary Wollstonecraft Shelley (2732)', 'P
ride and Prejudice by Jane Austen (1802)', 'The Scarlet Letter by Nathaniel Hawthorn
e (840)', 'The Great Gatsby by F. Scott  Fitzgerald (827)', "Alice's Adventures in W
onderland by Lewis Carroll (825)", 'The Adventures of Sherlock Holmes by Arthur Cona
n Doyle (766)', 'A Tale of Two Cities by Charles Dickens (742)', "A Doll's House : a
play by Henrik Ibsen (718)", 'The Yellow Wallpaper by Charlotte Perkins Gilman (71
7)', 'A Modest Proposal by Jonathan Swift (665)', 'The Picture of Dorian Gray by Osc
ar Wilde (639)', 'Great Expectations by Charles Dickens (614)', 'Dracula by Bram Sto
ker (588)', 'Moby Dick; Or, The Whale by Herman Melville (567)', 'Jane Eyre: An Auto
biography by Charlotte Brontë (546)', 'Ulysses by James Joyce (522)', 'The Souls of
Black Folk by W. E. B.  Du Bois (503)', 'Heart of Darkness by Joseph Conrad (489)',
'The Importance of Being Earnest: A Trivial Comedy for Serious People by Oscar Wilde
(469)', 'The Strange Case of Dr. Jekyll and Mr. Hyde by Robert Louis Stevenson (45
2)', 'Adventures of Huckleberry Finn by Mark Twain (445)', 'Narrative of the Life of
Frederick Douglass, an American Slave by Frederick Douglass (438)', 'The Importance
of Marking Historic Spots, an Address by Henry W. Shoemaker (438)', 'The Prince by N
iccolò Machiavelli (420)', 'A Christmas Carol in Prose; Being a Ghost Story of Chris
tmas by Charles Dickens (412)', 'Metamorphosis by Franz Kafka (410)', 'The Iliad by
Homer (383)', 'The Awakening, and Selected Short Stories by Kate Chopin (369)', "Gri
mms' Fairy Tales by Jacob Grimm and Wilhelm Grimm (367)", 'Crime and Punishment by F
yodor Dostoyevsky (346)', 'Struwwelpeter: Merry Stories and Funny Pictures by Heinri
ch Hoffmann (346)', 'A Likely Story by Damon Knight (339)', 'Walden, and On The Duty
Of Civil Disobedience by Henry David Thoreau (332)', 'Sam in the Suburbs by P. G.  W
odehouse (331)', 'A Very Naughty Girl by L. T. Meade (326)', 'The Interesting Narrat
ive of the Life of Olaudah Equiano, Or Gustavus Vassa, The African by Equiano (32
1)', 'War and Peace by graf Leo Tolstoy (318)', 'From Missouri by Zane Grey (315)',
'A Personal Problem by H.  Bedford-Jones (315)', 'Little Women by Louisa May Alcott
(313)', 'Anthem by Ayn Rand (312)', 'The Adventures of Tom Sawyer, Complete by Mark
Twain (304)', 'The Odyssey by Homer (294)', 'Second Treatise of Government by John L
ocke (294)', 'The Wonderful Wizard of Oz by L. Frank  Baum (293)', 'The Count of Mon
te Cristo, Illustrated by Alexandre Dumas (286)', 'The Republic by Plato (285)', 'Wu
thering Heights by Emily Brontë (256)', 'Leviathan by Thomas Hobbes (256)', 'The Cal
```

```
l of the Wild by Jack London (255)', 'Dubliners by James Joyce (255)', 'The Thousand
Buddhas: Ancient Buddhist Paintings from the Cave-Temples of Tun-huang on the Wester
n F (247)', "Gulliver's Travels into Several Remote Nations of the World by Jonathan
Swift (242)", 'The Cap and Gown by Charles Reynolds Brown (240)', 'Tractatus Logico-
Philosophicus by Ludwig Wittgenstein (240)', 'The Time Machine by H. G.  Wells (23
9)', 'Hadrian the Seventh by Frederick Rolfe (236)', 'Don Quixote by Miguel de Cerva
ntes Saavedra (236)', 'The Brothers Karamazov by Fyodor Dostoyevsky (236)', 'The Jun
gle by Upton Sinclair (235)', 'Les Misérables by Victor Hugo (232)', 'Anne of Green
Gables by L. M.  Montgomery (229)', "Uncle Tom's Cabin by Harriet Beecher Stowe (22
7)", 'Essays of Michel de Montaigne — Complete by Michel de Montaigne (227)', 'Narra
tive of the Captivity and Restoration of Mrs. Mary Rowlandson by Mary White Rowlands
on (226)', 'Beyond Good and Evil by Friedrich Wilhelm Nietzsche (226)', 'Treasure Is
land by Robert Louis Stevenson (224)', 'Peter Pan by J. M.  Barrie (216)', 'Beowulf:
An Anglo-Saxon Epic Poem (211)', 'The War of the Worlds by H. G.  Wells (209)', 'The
Theory of Moral Sentiments: Or, an Essay Towards an Analysis of the Principles by Wh
ich Men Natu (209)', 'Autobiography of Benjamin Franklin by Benjamin Franklin (20
5)', 'Frankenstein; Or, The Modern Prometheus by Mary Wollstonecraft Shelley (204)',
'Songs of Innocence and of Experience by William Blake (200)', 'Candide by Voltaire
(199)', 'Sense and Sensibility by Jane Austen (199)', 'The Works of Edgar Allan Poe
— Volume 2 by Edgar Allan Poe (197)', 'The Communist Manifesto by Friedrich Engels a
nd Karl Marx (195)', 'The Legend of Sleepy Hollow by Washington Irving (194)', 'The
Romance of Lust: A classic Victorian erotic novel by Anonymous (192)', 'Simple Sabot
age Field Manual by United States. Office of Strategic Services (191)', 'Notes from
the Underground by Fyodor Dostoyevsky (190)', 'Around the World in Eighty Days by Ju
les Verne (189)', 'Pygmalion by Bernard Shaw (187)', 'The Hound of the Baskervilles
by Arthur Conan Doyle (186)', 'Strife: A Drama in Three Acts by John Galsworthy (18
4)', 'The Prophet by Kahlil Gibran (182)', 'A Pickle for the Knowing Ones by Timothy
Dexter (180)', 'The Secret Garden by Frances Hodgson Burnett (179)', 'A Portrait of
the Artist as a Young Man by James Joyce (176)', 'Anna Karenina by graf Leo Tolstoy
(172)', 'Emma by Jane Austen (171)', 'Thus Spake Zarathustra: A Book for All and Non
e by Friedrich Wilhelm Nietzsche (167)', 'The Confessions of St. Augustine by Bishop
of Hippo Saint Augustine (164)', 'Romeo and Juliet by William Shakespeare (162)', 'T
he Mysterious Affair at Styles by Agatha Christie (161)', 'Noli Me Tangere by José R
izal (160)', 'Incidents in the Life of a Slave Girl, Written by Herself by Harriet
A.  Jacobs (157)', "Andersen's Fairy Tales by H. C.  Andersen (156)", 'Oliver Twist
by Charles Dickens (154)']
```

In [24]:

```
# Use regular expression to segregate the Text information in the EBooks data. Use m

top100_yest_books = []

# using for loop, and regular expression match() and span() methods

# Reegular expression helps to locate the starting index of textual part of the book
# span() method returns a tuple containing starting and ending index of the matched

for i in range(100):                                                    # p
    idx1, idx2 = re.match(r"^[A-Za-zè .0-9;,:—']*", yest_top100_list[i]).span()  # m
    top100_yest_books.append(yest_top100_list[i][idx1:idx2])            # a
    print(f'top100_yest_books text names [{i}]: {top100_yest_books[i]}')  # p
```

```
top100_yest_books text names [0]: Frankenstein; Or, The Modern Prometheus by Mary Wo
llstonecraft Shelley
top100_yest_books text names [1]: Pride and Prejudice by Jane Austen
top100_yest_books text names [2]: The Scarlet Letter by Nathaniel Hawthorne
top100_yest_books text names [3]: The Great Gatsby by F. Scott  Fitzgerald
top100_yest_books text names [4]: Alice's Adventures in Wonderland by Lewis Carroll
top100_yest_books text names [5]: The Adventures of Sherlock Holmes by Arthur Conan
Doyle
top100_yest_books text names [6]: A Tale of Two Cities by Charles Dickens
top100_yest_books text names [7]: A Doll's House : a play by Henrik Ibsen
top100_yest_books text names [8]: The Yellow Wallpaper by Charlotte Perkins Gilman
top100_yest_books text names [9]: A Modest Proposal by Jonathan Swift
```

```
top100_yest_books text names [10]: The Picture of Dorian Gray by Oscar Wilde
top100_yest_books text names [11]: Great Expectations by Charles Dickens
top100_yest_books text names [12]: Dracula by Bram Stoker
top100_yest_books text names [13]: Moby Dick; Or, The Whale by Herman Melville
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top100_yest_books text names [56]: Hadrian the Seventh by Frederick Rolfe
top100_yest_books text names [57]: Don Quixote by Miguel de Cervantes Saavedra
top100_yest_books text names [58]: The Brothers Karamazov by Fyodor Dostoyevsky
top100_yest_books text names [59]: The Jungle by Upton Sinclair
```

```
top100_yest_books text names [60]: Les Mis
top100_yest_books text names [61]: Anne of Green Gables by L. M.  Montgomery
top100_yest_books text names [62]: Uncle Tom's Cabin by Harriet Beecher Stowe
top100_yest_books text names [63]: Essays of Michel de Montaigne — Complete by Miche
l de Montaigne
top100_yest_books text names [64]: Narrative of the Captivity and Restoration of Mr
s. Mary Rowlandson by Mary White Rowlandson
top100_yest_books text names [65]: Beyond Good and Evil by Friedrich Wilhelm Nietzsc
he
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top100_yest_books text names [76]: The Works of Edgar Allan Poe — Volume 2 by Edgar
Allan Poe
top100_yest_books text names [77]: The Communist Manifesto by Friedrich Engels and K
arl Marx
top100_yest_books text names [78]: The Legend of Sleepy Hollow by Washington Irving
top100_yest_books text names [79]: The Romance of Lust: A classic Victorian erotic n
ovel by Anonymous
top100_yest_books text names [80]: Simple Sabotage Field Manual by United States. Of
fice of Strategic Services
top100_yest_books text names [81]: Notes from the Underground by Fyodor Dostoyevsky
top100_yest_books text names [82]: Around the World in Eighty Days by Jules Verne
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Joyce
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top100_yest_books text names [91]: Emma by Jane Austen
top100_yest_books text names [92]: Thus Spake Zarathustra: A Book for All and None b
y Friedrich Wilhelm Nietzsche
top100_yest_books text names [93]: The Confessions of St. Augustine by Bishop of Hip
po Saint Augustine
top100_yest_books text names [94]: Romeo and Juliet by William Shakespeare
top100_yest_books text names [95]: The Mysterious Affair at Styles by Agatha Christi
e
top100_yest_books text names [96]: Noli Me Tangere by Jos
top100_yest_books text names [97]: Incidents in the Life of a Slave Girl, Written by
Herself by Harriet A.  Jacobs
top100_yest_books text names [98]: Andersen's Fairy Tales by H. C.  Andersen
top100_yest_books text names [99]: Oliver Twist by Charles Dickens
```

'''In this activity, you will build a complete movie database by communicating and interfacing with a free API. You will learn about obtaining a unique user key that must be used when your program tries to access the API. This activity will teach you general chapters about working with an API, which are fairly common for other highly popular API services such as Google or Twitter.

Therefore, after doing this exercise, you will be confident about writing more complex programs to scrape data from such services.'''

In [33]:
```
# Data Wrangling with Python: Activity 10, page 295

# Importing required libraries for this exercise urllib.request for opening and read

import urllib.request, urllib.parse, urllib.error
import json
```

In [34]:
```
# 2,3,4. Read the api_key from the json file stored locally. this key will be used t

with open("OMDB_Key.json") as f:
    json_data = json.load(f)
    api_key = json_data['OMDBAPIKey']
```

In [35]:
```
# 5. Create a service url variable consisting of base url link

service_url = "http://www.omdbapi.com/?"
```

In [36]:
```
# 6. Create apikey variable to be appended to the service_url for api call

apikey = '&apikey='+api_key
```

In [37]:
```
# 7. Utility function print_json to print the movie information from the portal.
# I received a link in the email indicatng a sample movie information http://www.omd
# Below is the sample information present under the link {"Title":"Guardians of the
# Fields present in the IMDB Fields: 'Title', 'Year', 'Rated', 'Released', 'Runtime'

def print_json(json_data):

    # prepare the list of keys from the json format movie data, retrieved from the O

    keys_list = ["Title", "Year", "Rated", "Released", "Runtime", "Genre", "Director
                 "Country", "Awards", "Poster", "Ratings", "Metascore", "imdbRating",
                 "BoxOffice", "Production", "Website", "Response"]

    print("=" * 60)

    # print the formatted data about the movies from the json_data provided as input

    for key in keys_list:
        if key in list(json_data.keys()):
            print(f'{key}: {json_data[key]}')

    print("=" * 60)
```

In [38]:
```
# 8.Write a utility function to download a poster of the movie based on the informat
# Use the os module. The poster data is stored in the JSON key Poster. Use the Pytho

# Import the libraies on os Module to choose the files from the current directory

import os
```

In [50]:
```

```

```
# Function to store the dataset in json format in the local folder

def save_poster(json_data):

    title = json_data['Title']          # Get the title of the movie
    poster_url = json_data['Poster']    # Get the poster for the movie

    # Use the separator "." to split the data read from json
    poster_file_extension=poster_url.split('.')[-1]

    # Reads the image of the movie poster file from web
    poster_data = urllib.request.urlopen(poster_url).read()

    savelocation=os.getcwd()+'\\'+'Posters'+'\\'

    # Creates new directory if the directory does not exist. Otherwise, just use the
    if not os.path.isdir(savelocation):
        os.mkdir(savelocation)

    filename=savelocation+str(title)+'.'+poster_file_extension
    f=open(filename,'wb')
    f.write(poster_data)
    f.close()
    print("The poster has been successfully saved in the beloe path:")
    print(savelocation)
```

''' Write a utility function called search_movie to search for a movie by its name, print the downloaded JSON data, and save the movie poster in the local folder. Use a try-except loop for this. Use the previously created serviceurl and apikey variables. You have to pass on a dictionary with a key, t, and the movie name as the corresponding value to the urllib.parse.urlencode() function and then add the serviceurl and apikey to the output of the function to construct the full URL. This URL will be used to access the data. The JSON data has a key called Response. If it is True, that means the read was successful. Check this before processing the data. If it's not successful, then print the JSON key Error, which will contain the appropriate error message returned by the movie database.'''

In [51]:

```
# Function to search the movie by title The imdb link with title and apikey is passe

def search_movie(title):
    try:
        url = service_url + urllib.parse.urlencode({'t': str(title)})+"&apikey="+api
        print(f'Retrieving the data of "{title}" now... ')
        print(url)
        uh = urllib.request.urlopen(url)
        data = uh.read()
        json_data=json.loads(data)

        if json_data['Response']=='True':
            print_json(json_data)

# User Input: Asks user whether to download the poster of the movie
            if json_data['Poster']!='N/A':
                save_poster(json_data)
        else:
            print("Error encountered: ",json_data['Error'])

    except urllib.error.URLError as e:
        print(f"ERROR: {e.reason}")
```

In [52]:
```
# 10. Test the search_movie function by entering Titanic.

search_movie("Titanic")
```

```
Retrieving the data of "Titanic" now...
http://www.omdbapi.com/?t=Titanic&apikey=5582d4a7
============================================================
Title: Titanic
Year: 1997
Rated: PG-13
Released: 19 Dec 1997
Runtime: 194 min
Genre: Drama, Romance
Director: James Cameron
Writer: James Cameron
Actors: Leonardo DiCaprio, Kate Winslet, Billy Zane
Plot: A seventeen-year-old aristocrat falls in love with a kind but poor artist aboa
rd the luxurious, ill-fated R.M.S. Titanic.
Awards: Won 11 Oscars. 125 wins & 83 nominations total
Poster: https://m.media-amazon.com/images/M/MV5BMDdmZGU3NDQtY2E5My00ZTliLWIzOTUtMTY4
ZGI1YjdiNjk3XkEyXkFqcGdeQXVyNTA4NzY1MzY@._V1_SX300.jpg
Ratings: [{'Source': 'Internet Movie Database', 'Value': '7.8/10'}, {'Source': 'Rott
en Tomatoes', 'Value': '89%'}, {'Source': 'Metacritic', 'Value': '75/100'}]
Metascore: 75
imdbRating: 7.8
imdbVotes: 1,117,107
imdbID: tt0120338
Type: movie
DVD: 08 Jan 2002
BoxOffice: $659,363,944
Production: N/A
Website: N/A
Response: True
============================================================
The poster has been successfully saved in the beloe path:
C:\Users\KesavAdithya\PycharmProjects\DSC540\Week 09-10\Posters\
```

In [1]:
```
# Showing the poster of the movie from local folder;
from IPython.display import Image
Image(filename='Posters\Titanic.jpg')
```

Out[1]:

The image has been successfully shown from the local folder

''' Test the search_movie function by entering 'Random_error' (obviously, this will not be found, and you should be able to check whether your error catching code is working properly). '''

In [56]:
```
# search the movie named with Random_error

search_movie("Random_error")
```

```
Retrieving the data of "Random_error" now...
http://www.omdbapi.com/?t=Random_error&apikey=5582d4a7
Error encountered:  Movie not found!
```

''' From the above result, we could see that it has returned the error message. So, there is no movie with a name Random_error. So, our code is working fine as expected. '''

In [57]:
```
# Connect to the Twitter API and do a simple data pull


# Instal the necessary  Twitter library available for python

!pip install python-twitter
```

```
Collecting python-twitter
  Downloading python_twitter-3.5-py2.py3-none-any.whl (67 kB)
Requirement already satisfied: requests in c:\users\kesavadithya\anaconda3\lib\site-
packages (from python-twitter) (2.25.1)
Requirement already satisfied: future in c:\users\kesavadithya\anaconda3\lib\site-pa
ckages (from python-twitter) (0.18.2)
Collecting requests-oauthlib
  Downloading requests_oauthlib-1.3.1-py2.py3-none-any.whl (23 kB)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\kesavadithya\anaconda3
\lib\site-packages (from requests->python-twitter) (2020.12.5)
Requirement already satisfied: chardet<5,>=3.0.2 in c:\users\kesavadithya\anaconda3
\lib\site-packages (from requests->python-twitter) (4.0.0)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\kesavadithya\anacon
da3\lib\site-packages (from requests->python-twitter) (1.26.4)
Requirement already satisfied: idna<3,>=2.5 in c:\users\kesavadithya\anaconda3\lib\s
ite-packages (from requests->python-twitter) (2.10)
Collecting oauthlib>=3.0.0
  Downloading oauthlib-3.2.0-py3-none-any.whl (151 kB)
Installing collected packages: oauthlib, requests-oauthlib, python-twitter
Successfully installed oauthlib-3.2.0 python-twitter-3.5 requests-oauthlib-1.3.1
```

''' Assignment Steps:

a. If you don’t have a twitter account – create one at twitter.com/signup (you can delete the account after this assignment)
b. Sign in to apps.twitter.com
c. Click “Create New App”
d. Give your app a name and description
e. Agree to the developer agreement – you will want to make sure to indicate this is for a class project, and this step can take several days to get through, so don’t wait until last minute to complete this portion of the assignment
f. Create an access token
g. You should receive a consumer key and a token
'''

I have followed the above mentioned steps to create a APP called "KesavDSC540" and received consumer key and token to connect to twitter account

h. Using either the instructions from the book on connecting to an API or for help look here – pull back data searching for “Bellevue University” and “Data Science” (or something else you are

interested in)

In [103…
```
# Importing Twitter and setting up my user keys

import twitter
```

In [110…
```
# Reading json file to get the access and secret keys for Twitter API

with open("twitter_api_key.json") as f:
    json_data = json.load(f)
    consumer_key  = json_data['consumer_key']
    consumer_secret = json_data['consumer_secret']
    access_token_key = json_data['access_token_key']
    access_token_secret = json_data['access_token_secret']
f.close()
```

In [111…
```
# Creating API with user keys read in above step

api = twitter.Api(consumer_key=consumer_key,
  consumer_secret=consumer_secret,
    access_token_key=access_token_key,
    access_token_secret=access_token_secret)
```

In [112…
```
# validating that the credentials are accurate

print(api.VerifyCredentials())
```

{"created_at": "Sun Jan 27 14:34:06 +0000 2013", "default_profile": true, "favourites_count": 82, "followers_count": 17, "friends_count": 303, "id": 1125230785, "id_str": "1125230785", "location": "Waukegan, IL", "name": "Kesav Adithya Venkidusamy", "profile_background_color": "C0DEED", "profile_background_image_url": "http://abs.twimg.com/images/themes/theme1/bg.png", "profile_background_image_url_https": "https://abs.twimg.com/images/themes/theme1/bg.png", "profile_image_url": "http://pbs.twimg.com/profile_images/748026853198274560/Wt1mImwT_normal.jpg", "profile_image_url_https": "https://pbs.twimg.com/profile_images/748026853198274560/Wt1mImwT_normal.jpg", "profile_link_color": "1DA1F2", "profile_sidebar_border_color": "C0DEED", "profile_sidebar_fill_color": "DDEEF6", "profile_text_color": "333333", "profile_use_background_image": true, "screen_name": "KesavadithyaV", "status": {"created_at": "Tue Sep 29 05:49:37 +0000 2020", "favorite_count": 1, "favorited": true, "id": 1310818995570987008, "id_str": "1310818995570987008", "lang": "en", "media": [{"display_url": "pic.twitter.com/gU8KZiypRc", "expanded_url": "https://twitter.com/KeshavAadithya/status/1310818995570987008/photo/1", "id": 1310818989753409536, "media_url": "http://pbs.twimg.com/media/EjD27RkWoAAU6Um.jpg", "media_url_https": "https://pbs.twimg.com/media/EjD27RkWoAAU6Um.jpg", "sizes": {"large": {"h": 2048, "resize": "fit", "w": 2048}, "medium": {"h": 1200, "resize": "fit", "w": 1200}, "small": {"h": 680, "resize": "fit", "w": 680}, "thumb": {"h": 150, "resize": "crop", "w": 150}}, "type": "photo", "url": "https://t.co/gU8KZiypRc"}], "source": "Twitter for iPhone", "text": "#PrimeDayPhotos @amazonphotos Cool dude..!! https://t.co/gU8KZiypRc"}, "statuses_count": 6, "withheld_in_countries": []}

In [105…
```
# searching for last 10 tweets with search term Bellevue University since 01/01/2022

api.GetSearch(term='Bellevue University', since=2022-1-1, count=10)
```

Out[105…
```
[Status(ID=1493735334542135298, ScreenName=RachaelLudwick, Created=Tue Feb 15 23:53:50 +0000 2022, Text='@AnnaZivarts There at least was one in university village mall which ... is a faux pedestrianized space that is inc… https://t.co/kH6gdE8VaY'),
```

```
 Status(ID=1493729903262711809, ScreenName=MutiaraTirtania, Created=Tue Feb 15 23:3
2:15 +0000 2022, Text='🏀HS Boys Basketball\nMayfield vs St. Mary\nRussell County vs
Danville\nUniversity Heights vs Christian County\nWest Jes… https://t.co/nzU6l5nkn
e'),
 Status(ID=1493724074606006281, ScreenName=RandiElainePena, Created=Tue Feb 15 23:0
9:06 +0000 2022, Text='RT @DroverAthletics: #14 Science &amp; Arts⚾ is off to a gre
at start to the season and this weekend they host home-opening series against Fri
e…'),
 Status(ID=1493709939956752388, ScreenName=jacebrandy, Created=Tue Feb 15 22:12:56 +
0000 2022, Text='RT @DroverAthletics: #14 Science &amp; Arts⚾ is off to a great sta
rt to the season and this weekend they host home-opening series against Frie…'),
 Status(ID=1493709209128550413, ScreenName=BUCareer2, Created=Tue Feb 15 22:10:01 +0
000 2022, Text='Looking to take the SHRM but not prepared? BU will be offering an on
line preparation course.  Check out the article… https://t.co/uF5qPfcyIh'),
 Status(ID=1493708966844682248, ScreenName=NAIABall, Created=Tue Feb 15 22:09:04 +00
00 2022, Text='RT @DroverAthletics: #14 Science &amp; Arts⚾ is off to a great start
to the season and this weekend they host home-opening series against Frie…'),
 Status(ID=1493708638388637705, ScreenName=TShoe9, Created=Tue Feb 15 22:07:45 +0000
2022, Text='RT @DroverAthletics: #14 Science &amp; Arts⚾ is off to a great start to
the season and this weekend they host home-opening series against Frie…'),
 Status(ID=1493708574316449798, ScreenName=DroverAthletics, Created=Tue Feb 15 22:0
7:30 +0000 2022, Text='#14 Science &amp; Arts⚾ is off to a great start to the seaso
n and this weekend they host home-opening series against F… https://t.co/JFdw5ZxxQ
R'),
 Status(ID=1493696990529703941, ScreenName=BeranekReading, Created=Tue Feb 15 21:21:
28 +0000 2022, Text="RT @BPSFNE: Don't forget to check out this amazing opportunity!
Bellevue University has partnered with BPS Foundation to offer full-ride sc…"),
 Status(ID=1493696842021883910, ScreenName=BPSFNE, Created=Tue Feb 15 21:20:53 +0000
2022, Text="Don't forget to check out this amazing opportunity! Bellevue University
has partnered with BPS Foundation to offer… https://t.co/gBaq2STHPs")]
```

In [106…

```
# searching for last 10 tweets with data science

api.GetSearch(term='Data Science', count=10)
```

Out[106…

```
[Status(ID=1493352575105703939, ScreenName=NASA, Created=Mon Feb 14 22:32:53 +0000 2
022, Text='Our #IXPE observatory sent back its first science image: Cassiopeia A—the
remains of a star that exploded 11,000 li… https://t.co/tAb3OL5LSp'),
 Status(ID=1493331606446223361, ScreenName=cspan, Created=Mon Feb 14 21:09:34 +0000
2022, Text='.@LeaderMcConnell: "The only science that\'s changed in the last two wee
ks is the political science. The only data t… https://t.co/Twh8IZ4mPQ'),
 Status(ID=1493214838448922633, ScreenName=EssexPR, Created=Mon Feb 14 13:25:34 +000
0 2022, Text='Time to be sensible, time to sit down and heal any arguments you’ve ha
d with family or friends over Covid or vaccin… https://t.co/Lfe3UKRF5L'),
 Status(ID=1493746250965225472, ScreenName=milantactics, Created=Wed Feb 16 00:37:13
+0000 2022, Text='RT @keralista: Interesting Thread. A lot of the elements spoken he
re seem very similar. The Moneyball approach is what Milan are employing…'),
 Status(ID=1493746094005620738, ScreenName=rkb123rkb, Created=Wed Feb 16 00:36:35 +0
000 2022, Text='RT @anish_koka: I imagine that for some journalists finding out that
the CDC is the master of cherry-picking data will be like that time yo…'),
 Status(ID=1493746038171185152, ScreenName=TheRealAstroman, Created=Wed Feb 16 00:3
6:22 +0000 2022, Text='RT @NASA_Marshall: Just in time for #ValentinesDay, NASA’s Im
aging X-Ray Polarimetry Explorer has delivered its first imaging data since co…'),
 Status(ID=1493745976959373314, ScreenName=cs_swat, Created=Wed Feb 16 00:36:08 +000
0 2022, Text='New Swarthmore Computer Science course for Fall 2024! CS05: Special To
pics in Theoretical Design. In this class, st… https://t.co/mmPDaPvg5A'),
 Status(ID=1493745942239010816, ScreenName=pj_towns, Created=Wed Feb 16 00:35:59 +00
00 2022, Text='@MySharonaBrown @nckhui @JMartin4Schools Look \n\nAnother scared adul
t that doesn’t realize there is no science to su… https://t.co/F5kKOGjIr4'),
 Status(ID=1493745861540691968, ScreenName=MaryKRe, Created=Wed Feb 16 00:35:40 +000
0 2022, Text='@kuzcats @AblemanAdam Excellent explanation I just came across detaili
ng how CDC &amp; others manipulate data for “myoc… https://t.co/Gh782djf87'),
 Status(ID=1493745806909734913, ScreenName=MikeMorsch, Created=Wed Feb 16 00:35:27 +
```

```
0000 2022, Text='RT @SIGinsights: 🎤 We had the pleasure of speaking with Lukas Wawr
la, one of Archlet's Co-Founders, about how Archlet combines data science…')]
```

a. Line

b. Scatter

c. Bar

d. Histogram

e. Density Plot

f. Pie Chart

In [63]:
```
# 4. Using one of the datasets provided in Weeks 7 & 8, or a dataset of your own, ch

# Import the necessary libraries required for this exercises.

import numpy as np
import pandas as pd
pd.options.mode.chained_assignment = None
import matplotlib.pyplot as plt
```

In [64]:
```
# I have considered Boston Housing dataset for this assignment. Hence creating panda

house_df = pd.read_csv("Boston_housing.csv",error_bad_lines=False, index_col=False,
```

In [67]:
```
# printing the shape of the dataframe and count

print("The number of rows and columns present in the dataframe: {}".format(house_df.
print("\nSample records")
house_df.head()
```

```
The number of rows and columns present in the dataframe: (506, 14)

Sample records
```

Out[67]:

	CRIM	ZN	INDUS	CHAS	NOX	RM	AGE	DIS	RAD	TAX	PTRATIO	B	LSTAT	PR
0	0.00632	18	2.31	0	0.538	6.575	65.2	4.09	1	296	15.3	396.9	4.98	
1	0.02731	0	7.07	0	0.469	6.421	78.9	4.9671	2	242	17.8	396.9	9.14	2
2	0.02729	0	7.07	0	0.469	7.185	61.1	4.9671	2	242	17.8	392.83	4.03	3
3	0.03237	0	2.18	0	0.458	6.998	45.8	6.0622	3	222	18.7	394.63	2.94	3
4	0.06905	0	2.18	0	0.458	7.147	54.2	6.0622	3	222	18.7	396.9	5.33	3

In [71]:
```
# printing the datatypes for each of the field present in the dataframe

house_df.dtypes
```

Out[71]:
```
CRIM       object
ZN         object
INDUS      object
CHAS       object
NOX        object
RM         object
AGE        object
DIS        object
RAD        object
```

```
TAX        object
PTRATIO    object
B          object
LSTAT      object
PRICE      object
dtype: object
```

In [74]:

```
# Converting the metadata to float based on the data present in each of the column

house_df['CRIM']=house_df['CRIM'].astype(float,errors='raise')
house_df['INDUS']=house_df['INDUS'].astype(float,errors='raise')
house_df['NOX']=house_df['NOX'].astype(float,errors='raise')
house_df['RM']=house_df['RM'].astype(float,errors='raise')
house_df['AGE']=house_df['AGE'].astype(float,errors='raise')
house_df['DIS']=house_df['DIS'].astype(float,errors='raise')
house_df['PTRATIO']=house_df['PTRATIO'].astype(float,errors='raise')
house_df['B']=house_df['B'].astype(float,errors='raise')
house_df['LSTAT']=house_df['LSTAT'].astype(float,errors='raise')
house_df['PRICE']=house_df['PRICE'].astype(float,errors='raise')
house_df['ZN']=house_df['ZN'].astype(float,errors='raise')
house_df['CHAS']=house_df['CHAS'].astype(int,errors='raise')
house_df['RAD']=house_df['RAD'].astype(int,errors='raise')
house_df['TAX']=house_df['TAX'].astype(int,errors='raise')
```

In [75]:

```
# Print the metadata after conversion

house_df.dtypes
```

Out[75]:

```
CRIM       float64
ZN         float64
INDUS      float64
CHAS         int32
NOX        float64
RM         float64
AGE        float64
DIS        float64
RAD          int32
TAX          int32
PTRATIO    float64
B          float64
LSTAT      float64
PRICE      float64
dtype: object
```

In [81]:

```
# Plotting the necessary line chart for the house dataframe

house_df.plot.line(title="Housing Dataset Line Chart")
```

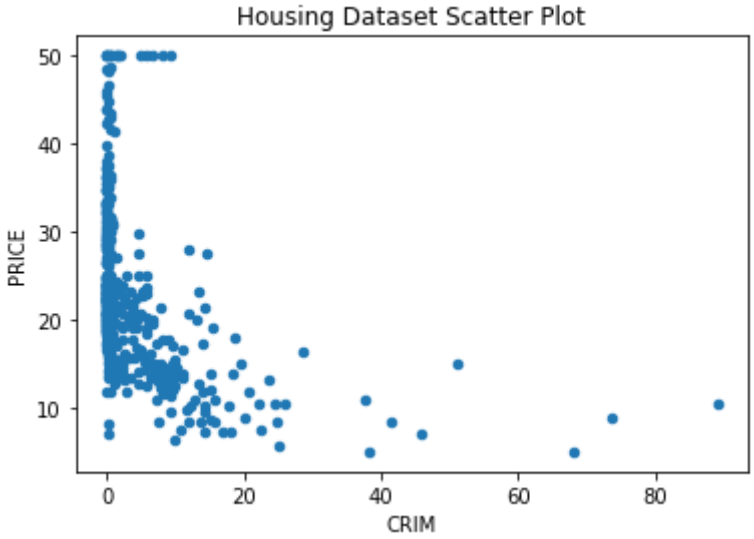
Out[81]:

```
<AxesSubplot:title={'center':'Housing Dataset Line Chart'}>
```

In [86]:
```
# Plotting the scatter plot for housing dataframe

house_df.plot.scatter(x='CRIM',y='PRICE', title="Housing Dataset Scatter Plot")
```

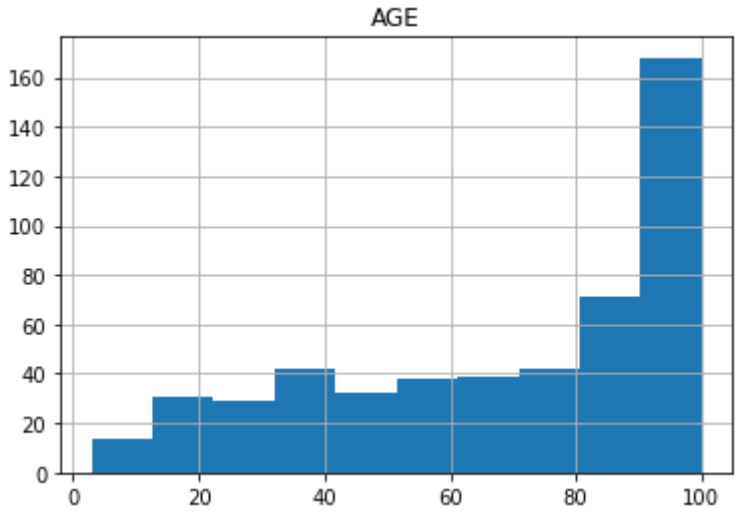
Out[86]:
```
<AxesSubplot:title={'center':'Housing Dataset Scatter Plot'}, xlabel='CRIM', ylabel
='PRICE'>
```



In [88]:
```
# plotting histogram for the housing dataset

house_df.hist(column='AGE',bins=10)
```

Out[88]:
```
array([[<AxesSubplot:title={'center':'AGE'}>]], dtype=object)
```



In [97]:
```
# Plotting Pie chart for the house dataframe

house_pie_df = house_df[['RAD','CRIM']].groupby('RAD').count()
house_pie_df
```

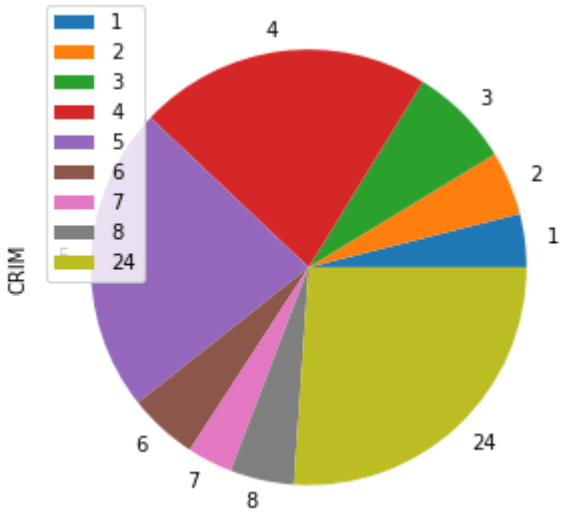
Out[97]:

RAD	CRIM
1	20
2	24
3	38
4	110
5	115
6	26
7	17
8	24
24	132

In [102…
```
# Plot pie chart for the dataframe created

house_pie_df.plot.pie(y="CRIM",figsize=(5,5))
```

Out[102…
```
<AxesSubplot:ylabel='CRIM'>
```


1
2
3
4
5
6
7
8
24
CRIM
4
3
2
1
24
6
7
8