Submission for Project 2

Team Xeno:

Members:

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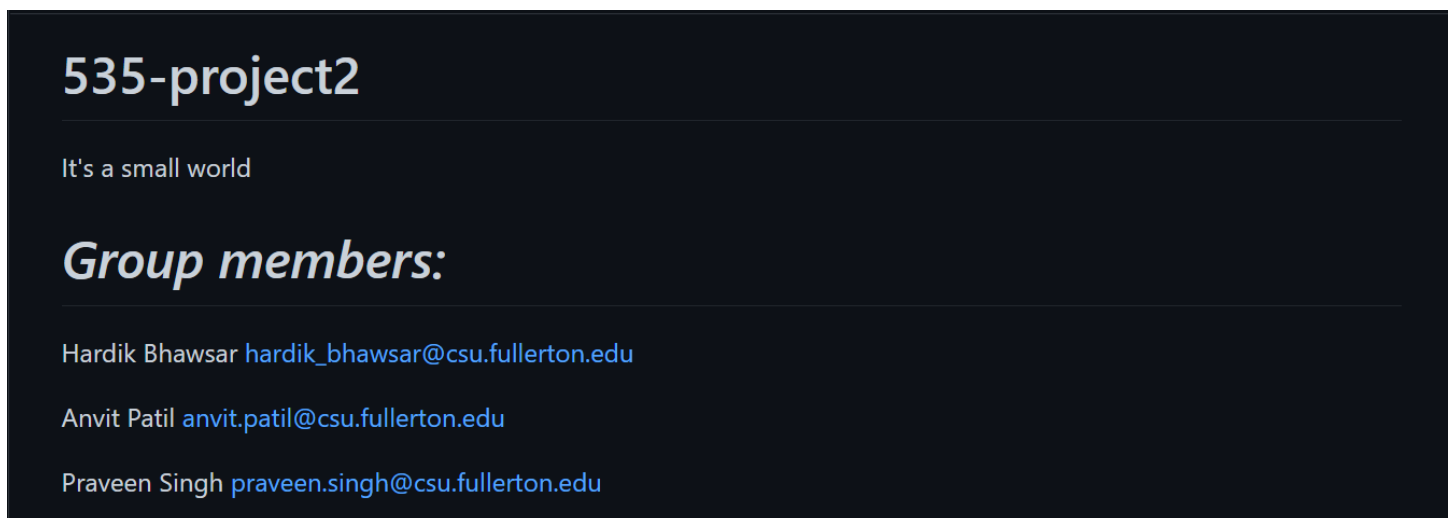- Praveen Singh   (Praveen.singh@csu.fullerton.edu)

535-project2

It's a small world

Group members:

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Fig 1: README.md with a list of group members

Summary :

The given project is the spin-off of the popular game "Six Degrees of Kevin Bacon" The Six Degrees of Kevin Bacon game is based upon the concept of six degrees of separation. This concept states that any two people on earth can be linked together through six or less acquaintances. For the Kevin Bacon game, the challenge is to find the shortest path possible between Kevin Bacon and another actor. Similarly, this project suggests us to find the shortest connection between the cast of two movies. The shortest connection can be either 1, 2, or greater than 2 or may be no connection at all. We assume that the name of each actor is a string, thus a cast is a set of strings, ordered in alphabetical order. But it does not matter whether they are listed alphabetically or not, but for simplicity, let's list them in alphabetical order.

The input will be a positive integer n > 2, and a list of n casts from which the first two sets are more significant, CAST[0] and CAST[1]. If the two casts CAST[0] and CAST[1] have at least one string in common, then the shortest

connection is 1. If the two casts CAST[0] and CAST[1] do not have any string in common, then look for another cast in the list of n casts, let's called it tempCast, such that CAST[0] and tempCast have a string in common, and CAST[1] and tempCast have a string common, then the shortest connection is 2. Else the shortest connection is greater than 2 or there is no connection.

Technologies and tools

Python

For this project we will be using python as it is a highly portable language, with rich function library. Moreover, it is a powerful, fast and an efficient language making it a first-rate alternative for real-time mathematical simulations like these.

Python Library :

For using the richness of the python library we have used two most useful library which are helpful when dealing with data.

Pandas - **pandas** is a fast, powerful, flexible and easy to use open-source data analysis and manipulation tool, built on top of the Python programming language.

NumPy - The fundamental package for scientific computing with Python

Pseudocode:

//Checking .csv file existence

```
Try :
try:
    myfile = pd.read_csv("example3.csv") // Reading CSV with the help of pandas
    print("Reading "+file_name+" .....")
except OSError:
    print("File not found !!") // File not found ,  Exiting the code
    sys.exit()
```

//Data Cleaning (removing the nan values)

```
for files in myfile:
    if str(files) != "nan":
        castList.append(myfile[files].tolist())
cleanedCast = [list(filter(lambda x:x == x, y)) for y in castList
```

#if connection = 1 checking in cast0 and cast1

```
flag = 0
for each_cast in cleanedCast[0]:
    for each_cast1 in cleanedCast[1]:
        if each_cast == each_cast1:
            print("Shortest Connection = 1, Actor = ",each_cast )
            flag = 1
```

#If there is no connection = 1 then this loop exists and checks for conneciton = 2

```
if flag == 0:
    for each_cast in cast0:
        for i in range(0, len(cleanedCast)):
            for j in cleanedCast[i]:
                if each_cast in cleanedCast[i]:
                    for each_cast1 in cast1:
                        if each_cast1 == j:
                            print("Shortest Connection = 2, Cast = ", cleanedCast[i])
                            flag = 1
```

#if connection>2 or no connection
```
if flag == 0:
    print("Connection > 2 or no connection.")
```

Implementation:

```
1    import pandas as pd
2    import numpy as np
3    import sys
4
5    castList = []
6    cleanedCast = []
7    file_name = "example1.csv"
8
9    #reading the csv file having cast data
10   try:
11       myfile = pd.read_csv("example3.csv")
12       print("Reading "+file_name+" .....")
13   except OSError:
14       print("File not found !!")
15       sys.exit()
16   #Data cleaning (removing nan values)
17   for files in myfile:
18       if str(files) != "nan":
19           castList.append(myfile[files].tolist())
20   cleanedCast = [list(filter(lambda x:x == x, y)) for y in castList]
21   print("****************Cast List****************")
22   print(cleanedCast)
23
24   cast0 = cleanedCast[0]
25   cast1 = cleanedCast[1]
26   flag = 0
27   print("**********************************************************************")
28   #if connection = 1 checking in cast0 and cast1
29   for each_cast in cleanedCast[0]:
30       for each_cast1 in cleanedCast[1]:
31           if each_cast == each_cast1:
32               print("Shortest Connection = 1, Actor = ",each_cast )
33               flag = 1
34
35   #If there is no connection = 1 then this loop exists and checks for conneciton = 2
36   if flag == 0:
37       for each_cast in cast0:
38           for i in range(0, len(cleanedCast)):
39               for j in cleanedCast[i]:
40                   if each_cast in cleanedCast[i]:
41                       for each_cast1 in cast1:
42                           if each_cast1 == j:
43                               print("Shortest Connection = 2, Cast = ", cleanedCast[i])
44                               flag = 1
45   #if connection>2 or no connection
46   if flag == 0:
47       print("Connection > 2 or no connection.")
```

Working:

Use case 1 (Shortest Connection = 1)

```
csuftitan@LTMacAiM1165012 project-1---it-s-a-small-world-team-xeno-1 % python3 project.py
Reading example1.csv .....
*****************Cast List*****************
[['Carrie-Anne Moss', 'Gloria Foster', 'Hugo Weaving', 'Joe Pantoliano', 'Keanu Reeves', 'Laurence Fishburne', 'Marcus Chong'], ['Andre Braugh
er', 'Beau Garrett', 'Chris Evans', 'Doug Jones', 'Ioan Gruffudd', 'Jessica Alba', 'Julian McMahon', 'Kerry Washington', 'Laurence Fishburne',
 'Michael Chiklis'], ['Ewan McGregor', 'Ian McDiarmid', 'Jake Lloyd', 'Liam Neeson', 'Natalie Portman'], ['Geoffrey Rush', 'Jack Davenport', '
Johnny Depp', 'Jonathan Pryce', 'Keira Knightley', 'Orlando Bloom'], ['Angela Bassett', 'Chadwick Boseman', 'Danai Gurira', 'Daniel Kaluuya',
'Forest Whitaker', 'Letitia Wright', "Lupita Nyong'o", 'Martin Freeman', 'Michael B. Jordan', 'Sterling K. Brown', 'Winston Duke'], ['Andre B
orba', 'Anne Hathaway', 'Bill Irwin', 'Casey Affleck', 'Collette Wolfe', 'David Oyelowo', 'Francis X. McCarthy', 'Jessica Chastain', 'John Lit
hgow', 'Matthew McConaughey', 'Michael Caine', 'Wes Bentley', 'William Devane']]
*****************************************************************
Shortest Connection = 1, Actor =  Laurence Fishburne
csuftitan@LTMacAiM1165012 project-1---it-s-a-small-world-team-xeno-1 %
```

Use case 2 (Shortest Connection = 2)

```
csuftitan@LTMacAiM1165012 project-1---it-s-a-small-world-team-xeno-1 %
csuftitan@LTMacAiM1165012 project-1---it-s-a-small-world-team-xeno-1 % python3 project.py
Reading example2.csv .....
*****************Cast List*****************
[['Carrie-Anne Moss', 'Gloria Foster', 'Hugo Weaving', 'Joe Pantoliano', 'Keanu Reeves', 'Laurence Fishburne', 'Marcus Chong'], ['Andre Borba
', 'Anne Hathaway', 'Bill Irwin', 'Casey Affleck', 'Collette Wolfe', 'David Oyelowo', 'Francis X. McCarthy', 'Jessica Chastain', 'John Lithgow
', 'Matthew McConaughey', 'Michael Caine', 'Wes Bentley', 'William Devane'], ['Geoffrey Rush', 'Jack Davenport', 'Johnny Depp', 'Jonathan Pryc
e', 'Keira Knightley', 'Orlando Bloom'], ['Angela Bassett', 'Chadwick Boseman', 'Danai Gurira', 'Daniel Kaluuya', 'Forest Whitaker', 'Letitia
Wright', 'Lupita Nyongo', 'Martin Freeman', 'Michael B. Jordan', 'Sterling K. Brown', 'Winston Duke'], ['Abraham Attah', 'Asa Butterfield', 'A
nne Hathaway', 'Chloe Grace Moretz', 'Daniel Radcliffe', 'Jeff Goldblum', 'Keanu Reeves', 'Tom Holland'], ['Andre Braugher', 'Beau Garrett', '
Chris Evans', 'Doug Jones', 'Ioan Gruffudd', 'Jessica Alba', 'Julian McMahon', 'Kerry Washington', 'Laurence Fishburne', 'Michael Chiklis'], [
'Ewan McGregor', 'Ian McDiarmid', 'Jake Lloyd', 'Liam Neeson', 'Natalie Portman']]
*****************************************************************
Shortest Connection = 2, Cast =  ['Abraham Attah', 'Asa Butterfield', 'Anne Hathaway', 'Chloe Grace Moretz', 'Daniel Radcliffe', 'Jeff Goldblu
m', 'Keanu Reeves', 'Tom Holland']
csuftitan@LTMacAiM1165012 project-1---it-s-a-small-world-team-xeno-1 %
```

Use case 3 (Shortest Connection > 2 or no connection)

```
csuftitan@LTMacAiM1165012 project-1---it-s-a-small-world-team-xeno-1 % python3 project.py
Reading example3.csv .....
*****************Cast List*****************
[['Ewan McGregor', 'Ian McDiarmid', 'Jake Lloyd', 'Liam Neeson', 'Natalie Portman'], ['Andre Borba', 'Anne Hathaway', 'Bill Irwin', 'Casey Af
fleck', 'Collette Wolfe', 'David Oyelowo', 'Francis X. McCarthy', 'Jessica Chastain', 'John Lithgow', 'Matthew McConaughey', 'Michael Caine',
'Wes Bentley', 'William Devane'], ['Geoffrey Rush', 'Jack Davenport', 'Johnny Depp', 'Jonathan Pryce', 'Keira Knightley', 'Orlando Bloom'], ['
Angela Bassett', 'Chadwick Boseman', 'Danai Gurira', 'Forest Whitaker', 'Letitia Wright', 'Lupita Nyongo', 'Martin Freeman', 'Michael B. Jorda
n', 'Sterling K. Brown', 'Winston Duke'], ['Abraham Attah', 'Asa Butterfield', 'Anne Hathaway', 'Chloe Grace Moretz', 'Daniel Radcliffe', 'Jef
f Goldblum', 'Keanu Reeves', 'Tom Holland'], ['Andre Braugher', 'Beau Garrett', 'Chris Evans', 'Doug Jones', 'Ioan Gruffudd', 'Jessica Alba',
'Julian McMahon', 'Kerry Washington', 'Laurence Fishburne', 'Michael Chiklis'], ['Carrie-Anne Moss', 'Gloria Foster', 'Hugo Weaving', 'Joe Pan
toliano', 'Keanu Reeves', 'Laurence Fishburne', 'Marcus Chong']]
*****************************************************************
Connection > 2 or no connection.
csuftitan@LTMacAiM1165012 project-1---it-s-a-small-world-team-xeno-1 %
```

Reference

[1] CPSC 535 Fall 2022 Project 2
https://docs.google.com/document/d/1XVFwlpOSkLcjsKFDcEDkFegZcOw7vjPb75fA3XyTbEI/edit