

## **Project 2: CPSC 535 - 01 - Advanced Algorithm**

### **Project Report - It's a Small World**

#### **Summary:**

In this project, a spin-off of the well-known game "Six Degrees of Kevin Bacon" must be implemented. In the game mentioned above, we connect Kevin Bacon with the movie cast he has worked with 6 degrees or less. Similarly, in this project, we need to find the shortest connection between the cast of two movies. The shortest connection can be either 1, 2, greater than 2, or no connection at all.

For calculating this connection, we need to take different dataset files containing variable sets of casts. The number of sets of cast denotes the variable 'n.' We order the cast as an array/list of strings from CAST[0], CAST[1], CAST[2] ..... CAST[n-1].

If cast[0] and cast[1] has one or more string in common, i.e., there is an actor who has worked in both movies, then the shortest connection is 1 for these two casts. If cast[0] and cast[1] don't have a common actor, but any one actor from cast[0] and cast[1] has worked together in the cast[2] to cast[n], then the shorted connection between them is 2. If both conditions fail, then either the shortest connection is greater than 2, or there is no connection at all.

#### ***Input Variables:***

1. The number of casts (n).
2. The list of the casts.

#### ***Output Variables:***

1. If shortest connect = 1, then shortest connection and common string.
2. If shortest connect = 2, then shortest connection and common list of cast connecting them.
3. Otherwise, display "Shortest connection > 2 or no connection."

## **Pseudocode:**

This program calculates and displays the shortest connection between the actors cast in two different movies. Connect can be 1, 2, greater than 2, or no connection at all.

### **START**

**Read the .csv file for input n and cast.**

### **FUNCTION SIMPLE\_CASE\_1()**

```
{
    for element_in_zero in CAST[0]:
        for element_in_one in CAST[1]:
            if element_in_zero == element_in_one:
                return "Shortest Connection = 1, Actor/Actress = " + "".join(element_in_zero)
}
```

### **FUNCTION SIMPLE\_CASE\_2()**

```
{
    for item0 in CAST[0]:
        for i in range(2, len(NEW_CAST)):
            for j in NEW_CAST[i]:
                if item0 in NEW_CAST[i]:
                    for item1 in CAST[1]:
                        if item1 == j:
                            return ("Shortest Connection = 2, ", NEW_CAST[i])
}
```

// Taking the output of the function in the result variables.

result\_1 = simple\_case\_1()

result\_2 = simple\_case\_2()

// Printing the results.

If result\_1 not None:

    print(result\_1)

Else If result\_2 is not None:

    print(result\_2)

Else:

```
print("Shortest Connection > 2 or no connection")
```

**END**

## Output Screenshots:

Readme.md:

```

┌ README.md
└
535-project2
┌
└ It's a small world

Group members:
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└ Nilay Jain | njain12@csu.fullerton.edu
  Yathartha Patankar | yatharthapatankar@csu.fullerton.edu

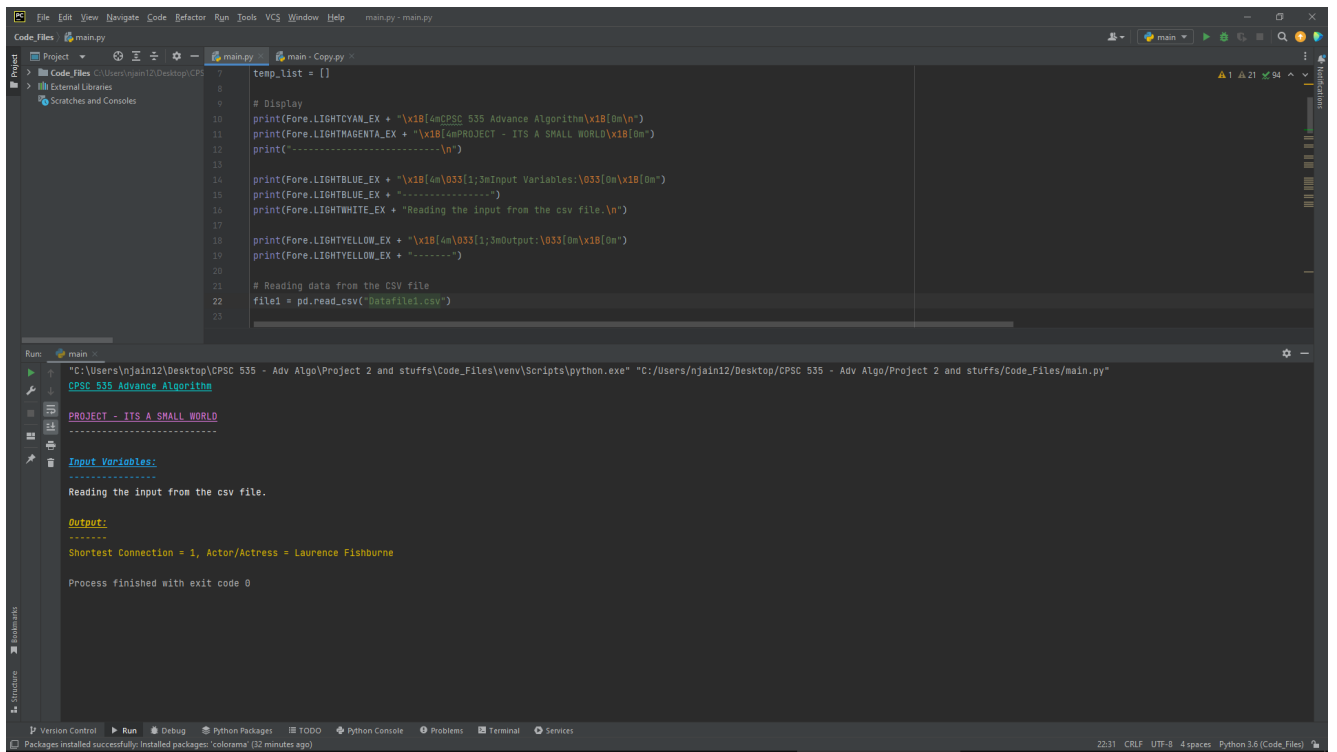
Project Description:
┌
└ In this project, a spin-off of the well-known game "Six Degrees of Kevin Bacon" must be implemented. In the game mentioned above, we connect Kevin Bacon with the movie cast he has worked with 6 degrees or less. Similarly, in this project, we need to find the shortest connection between the cast of two movies. The shortest connection can be either 1, 2, greater than 2, or no connection at all. For calculating this connection, we need to take different dataset files containing variable sets of casts. The number of sets of cast denotes the variable 'n.' We order the cast as an array/list of strings from CAST[0], CAST[1], CAST[2] ..... CAST[n-1].

  If cast[0] and cast[1] has one or more string in common, i.e., there is an actor who has worked in both movies, then the shortest connection is 1 for these two casts. If cast[0] and cast[1] don't have a common actor, but any one actor from cast[0] and cast[1] has worked together in the cast[2] to cast[n], then the shortest connection between them is 2. If both conditions fail, then either the shortest connection is greater than 2, or there is no connection at all.

Input Variables:
┌
└ The number of casts (n). The list of the casts.

Output Variables:
┌
└ If shortest connect = 1, then shortest connection and common string. If shortest connect = 2, then shortest connection and common list of cast connecting them. Otherwise, display "Shortest connection > 2 or no connection."
```

## Sample Input 1: (📄 DataFile1)



```
7 temp_list = []
8
9 # Display
10 print(Fore.LIGHTCYAN_EX + "\x1B[4mCPSC 535 Advance Algorithm\x1B[0m\n")
11 print(Fore.LIGHTMAGENTA_EX + "\x1B[4mPROJECT - ITS A SMALL WORLD\x1B[0m")
12 print("-----\n")
13
14 print(Fore.LIGHTBLUE_EX + "\x1B[4m\033[3mInput Variables:\033[0m\x1B[0m")
15 print(Fore.LIGHTBLUE_EX + "-----")
16 print(Fore.LIGHTWHITE_EX + "Reading the input from the csv file.\n")
17
18 print(Fore.LIGHTYELLOW_EX + "\x1B[4m\033[3mOutput:\033[0m\x1B[0m")
19 print(Fore.LIGHTYELLOW_EX + "-----")
20
21 # Reading data from the CSV file
22 file1 = pd.read_csv('Datafile1.csv')
23
```

Run: main

"C:\Users\njain12\Desktop\CPSC 535 - Adv Algo\Project 2 and stuffs\Code\_Files\venv\Scripts\python.exe" "C:\Users\njain12\Desktop\CPSC 535 - Adv Algo\Project 2 and stuffs\Code\_Files/main.py"

CPSC 535 Advance Algorithm

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Input Variables:

-----

Reading the input from the csv file.

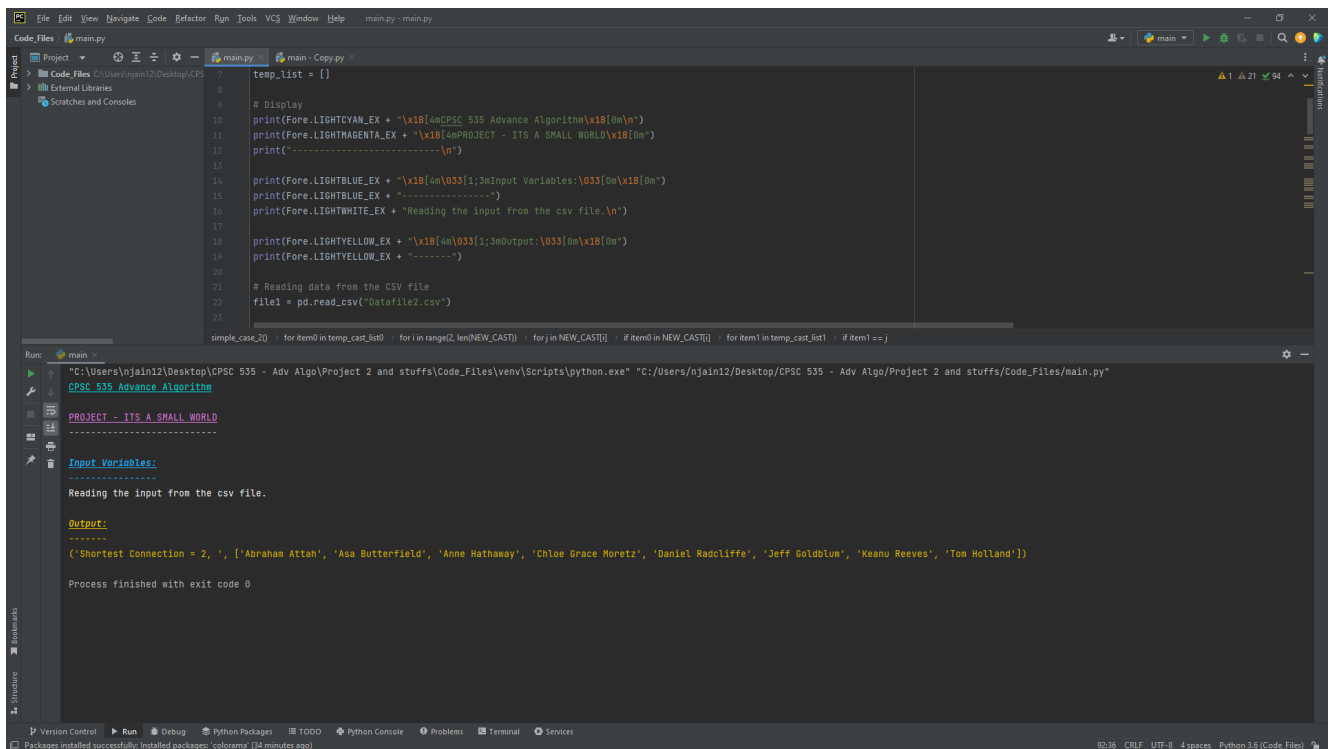
Output:

-----

Shortest Connection = 1, Actor/Actress = Laurence Fishburne

Process finished with exit code 0

## Sample Input 2: (📄 DataFile2)



```
7 temp_list = []
8
9 # Display
10 print(Fore.LIGHTCYAN_EX + "\x1B[4mCPSC 535 Advance Algorithm\x1B[0m\n")
11 print(Fore.LIGHTMAGENTA_EX + "\x1B[4mPROJECT - ITS A SMALL WORLD\x1B[0m")
12 print("-----\n")
13
14 print(Fore.LIGHTBLUE_EX + "\x1B[4m\033[3mInput Variables:\033[0m\x1B[0m")
15 print(Fore.LIGHTBLUE_EX + "-----")
16 print(Fore.LIGHTWHITE_EX + "Reading the input from the csv file.\n")
17
18 print(Fore.LIGHTYELLOW_EX + "\x1B[4m\033[3mOutput:\033[0m\x1B[0m")
19 print(Fore.LIGHTYELLOW_EX + "-----")
20
21 # Reading data from the CSV file
22 file1 = pd.read_csv('Datafile2.csv')
23
```

Run: main

"C:\Users\njain12\Desktop\CPSC 535 - Adv Algo\Project 2 and stuffs\Code\_Files\venv\Scripts\python.exe" "C:\Users\njain12\Desktop\CPSC 535 - Adv Algo\Project 2 and stuffs\Code\_Files/main.py"

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Input Variables:

-----

Reading the input from the csv file.

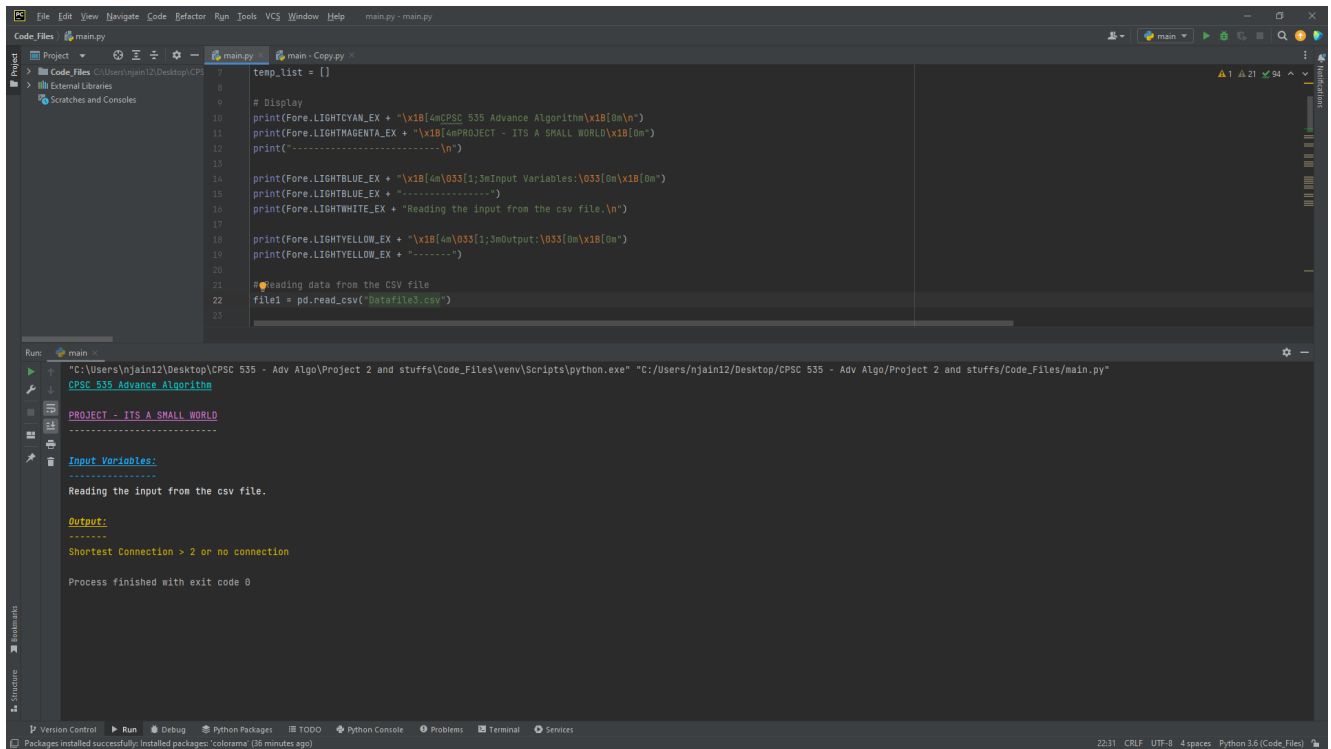
Output:

-----

('Shortest Connection = 2, ', ['Abraham Attah', 'Asa Butterfield', 'Anne Hathaway', 'Chloe Grace Moretz', 'Daniel Radcliffe', 'Jeff Goldblum', 'Keanu Reeves', 'Tom Holland'])

Process finished with exit code 0

### Sample Input 3: (+ DataFile3)



```
7 temp_list = []
8
9 # Display
10 print(Fore.LIGHTCYAN_EX + "\x1B[4mCPSC 535 Advance Algorithm\x1B[0m\n")
11 print(Fore.LIGHTMAGENTA_EX + "\x1B[4mPROJECT - ITS A SMALL WORLD\x1B[0m")
12 print("-----\n")
13
14 print(Fore.LIGHTBLUE_EX + "\x1B[4m\033[3mInput Variables:\033[0m\x1B[0m")
15 print(Fore.LIGHTBLUE_EX + "-----")
16 print(Fore.LIGHTWHITE_EX + "Reading the input from the csv file.\n")
17
18 print(Fore.LIGHTYELLOW_EX + "\x1B[4m\033[3mOutput:\033[0m\x1B[0m")
19 print(Fore.LIGHTYELLOW_EX + "-----")
20
21 #Reading data from the CSV file
22 file1 = pd.read_csv('Datafile3.csv')
23
```

Run: main

"C:\Users\njain12\Desktop\CPSC 535 - Adv Algo\Project 2 and stuffs\Code\_Files\venv\Scripts\python.exe" "C:\Users\njain12\Desktop\CPSC 535 - Adv Algo\Project 2 and stuffs\Code\_Files\main.py"

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Input Variables:

-----

Reading the input from the csv file.

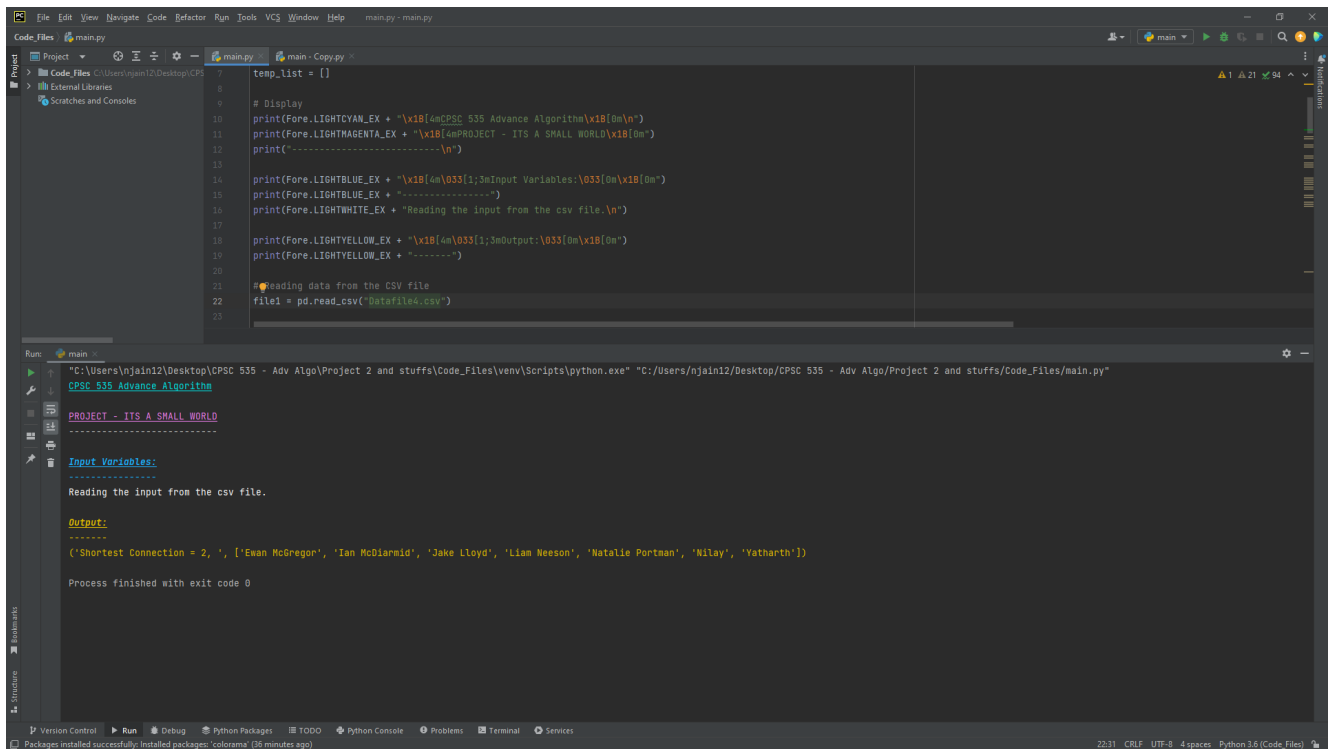
Output:

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Shortest Connection > 2 or no connection

Process finished with exit code 0

### Sample Input 4: (+ DataFile4)



```
7 temp_list = []
8
9 # Display
10 print(Fore.LIGHTCYAN_EX + "\x1B[4mCPSC 535 Advance Algorithm\x1B[0m\n")
11 print(Fore.LIGHTMAGENTA_EX + "\x1B[4mPROJECT - ITS A SMALL WORLD\x1B[0m")
12 print("-----\n")
13
14 print(Fore.LIGHTBLUE_EX + "\x1B[4m\033[3mInput Variables:\033[0m\x1B[0m")
15 print(Fore.LIGHTBLUE_EX + "-----")
16 print(Fore.LIGHTWHITE_EX + "Reading the input from the csv file.\n")
17
18 print(Fore.LIGHTYELLOW_EX + "\x1B[4m\033[3mOutput:\033[0m\x1B[0m")
19 print(Fore.LIGHTYELLOW_EX + "-----")
20
21 #Reading data from the CSV file
22 file1 = pd.read_csv('Datafile4.csv')
23
```

Run: main

"C:\Users\njain12\Desktop\CPSC 535 - Adv Algo\Project 2 and stuffs\Code\_Files\venv\Scripts\python.exe" "C:\Users\njain12\Desktop\CPSC 535 - Adv Algo\Project 2 and stuffs\Code\_Files\main.py"

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Input Variables:

-----

Reading the input from the csv file.

Output:

-----

('Shortest Connection = 2, ', ['Ewan McGregor', 'Ian McDiarmid', 'Jake Lloyd', 'Liam Neeson', 'Natalie Portman', 'Nilyay', 'Yatharth'])

Process finished with exit code 0