 

# Exercise 1.

1. You can work in pairs. The answer to the exercise has to be submitted to MOODLE on 01/05/2022. Each student must submit a file to MOODLE. The file name should include your ID number and that of your partner. The movie you work on should be a movie that appears in [free-screenplays-download](https://bulletproofscreenwriting.tv/free-screenplays-download/). You need to enter the name of the movie + your ID in this [google doc](https://docs.google.com/spreadsheets/d/1X2n-grbIl9rbn6DPQ_zj3KtgQQtcxI8ltV3Pp8OgwJQ/edit#gid=0).
2. The submission file has to be a .zip folder. It should include the following files:
   1. The script of the movie.
   2. A Wolfram Mathematica notebook of a Matlab file, or python code for each of the problems under different file names according to the problem number. If that files are too large then they may be uploaded to Google Drive or Dropbox and shared.
   3. A “AB.csv” file that has the following format

|  |  |  |
| --- | --- | --- |
| Response number | Speaker | What is said |

* 1. The srt-English.csv file that has the following format

|  |  |  |
| --- | --- | --- |
| A time when translation begins to appear on the screen. | A time when translation disappears from the screen | What is said in English |

* 1. The srt-Hebrew.csv file that has the following format

|  |  |  |
| --- | --- | --- |
| A time when translation begins to appear on the screen. | A time when translation disappears from the screen | What is said in Hebrew |

* 1. A “srt-script.csv” file that has the following format

|  |  |  |  |
| --- | --- | --- | --- |
| A time when translation begins to appear on the screen. | A time when translation disappears from the screen | What is said in English | Speaker |

* 1. A word file contains all the answer for all the problems in Part 1 and Part 2.

You can find the list of the movie in a [free-screenplays-download](https://bulletproofscreenwriting.tv/free-screenplays-download/).

If you need help finding the script, please contact me.

**Part 1**

1. **Answer the following problem work with the script of your movie.**
   1. Write the movie you selected
   2. Write a summary of the your movie.
   3. Before you start to compute, write who you think are the four main characters in your movie. Sort the characters by their importance.
   4. What is the weakness of each of the four characters.
   5. Defend the AB graph
   6. Compute the AB.csv file.
   7. Compute the four versions of the AB-graph from the AB.csv that are:

1. Undirected weighted graph, 2. Undirected non-weighted graph, 3. Directed weighted graph, and 4. Directed non-weighted graph. We denote these graphs by AB-script.

* 1. Compute who the four main characters are in the movie when you base your answer on the graph AB-script. Sort the characters by importance using **Degree Centrality** for the following four different graphs: undirected weighted graph, undirected non-weighted graph, directed weighted graph and directed non-weighted graph
  2. Compute who the four main characters are in the movie when you base your answer on the graph AB-script. Sort the characters by importance using **Page Rank Centrality**. For the four different graphs: undirected weighted graph, undirected non-weighted graph, directed weighted graph, and directed non-weighted graph
  3. Compute who the four main characters are in the movie when you base your answer on the graph AB-script. Sort the characters by importance using **Closeness Centrality**. For the four different graphs: undirected weighted graph, undirected non-weighted graph, directed weighted graph, and directed non-weighted graph.
  4. Compare the answers from sections 1c, 1h, 1i, and 1j. Write your answer in the word file and also in the [google doc](https://docs.google.com/spreadsheets/d/1bieSfBVb-5Z5xRS54OTtCm29OOqjib4NpJIGA53D_Z4/edit?usp=sharing).

1. **In the following question, we study the SRT of your movie.**
   1. Download the translation file and your movie in English.
   2. Write a program in your favorite language that computes the srt-English.csv
   3. Let V(AB) be the set of all characters who speak in your script. Compute the AB-SRT-graph. The nodes of the graph are the names of characters that appear in the srt file. Two nodes v1,v2 are connected by an edge if the names appear one after the other in the translation file (SRT).
   4. Compute the four versions of the **AB-graph** from the srt.csv that are:

1. Undirected weighted graph, 2. Undirected non-weighted graph, 3. Directed weighted graph, and 4. Directed non-weighted graph.

Denote this graph by AB-srt.

* 1. Compute the four versions of the **AB-srt-graph** from the AB.csv that are:

1. Undirected weighted graph, 2. Undirected non-weighted graph, 3. Directed weighted graph, and 4. Directed non-weighted graph.

* 1. Compare the answers of sections 1c, 2d, and 2e. Write your answer in the word file and also in the [google doc](https://docs.google.com/spreadsheets/d/1bieSfBVb-5Z5xRS54OTtCm29OOqjib4NpJIGA53D_Z4/edit?usp=sharing).

1. Merge the srt-English.csv file and the AB.csv together into the file “srt-script.csv”.

**Part 2**

1. **You need to answer this problem before moving on to the following problems**.
   1. Write the central conflict of your movie.
   2. Divide the ten main characters into two camps according to the primary conflict.
   3. For each of the parties, select one anchor/leader that represents the team.   
      Do the leaders have the same power?  
      Can you select the anchors in such a way that they have the same influence in their respective networks?   
      If not, select one anchor in one party and two in the others so that the overall influence is the same.
   4. Look for references online that support your conflicts.
2. Create the AB graph with the eight main characters in your movie/script.
   1. Run the **Voronoi algorithm** on the undirect weighted AB-graph of your script. Use the anchors you selected from problem 1. Calculate the decision matrix in this case.
   2. Run the **Voting algorithm** on the direct weighted AB-graph of your script. Use the anchors you choose from problem 1. Calculate the decision matrix in this case.
   3. Compute the similarity of the results between the outcome of the Voronoi and Voting algorithms. Which algorithm is better? Did the outcome of algorithms give you a different perspective on the conflict you chose in problem 1?
   4. Use the following community detection algorithms to partition your AB graph. Which of those algorithms make sense?
3. In this problem we will see how we can combine the Voronoi algorithm and the Voting algorithm.  
   **לוודא בועז**
   1. Find two characters in your movie that the Voronoi algorithm and the Voting algorithm do not agree on (i.e. in the Voting algorithm more than half of the node vote for node v while in the Voronoi algorithm less then half vote for v).
   2. Can you explain what the disagreement between the two algorithms is pointing out in your movie?
   3. In this section we follow the analysis of Sun Tzu. Sun Tzu notes that there are two types of attacks: direct attacks and indirect attacks. We will be looking at both by combining our two algorithms.
      1. Of the Voronoi algorithm and the Voting algorithm, which represents the direct attack and which represents the indirect attack? Does this follow your intuition?
      2. Compute the decision matrix
      3. Transform the distances matrix into a normalized frequency matrix i.e. vector probabilities
      4. Let . This is a convex combination where 0 ≤ t ≤ 1. Show that the distances matrix is a social social rational decision function for all t.
   4. Compute the t which gives the best equal partition for the two parties, i.e. the two parties in your movie have an equal size.
4. In this problem we use the idea from Chapter 9, The Search for Conflict, in the book *Analyzing Narratives in Social*. Compute the best conflict between the 4 main characters. You must calculate all the possibilities that divide the four characters into two groups i.e. 24-1=15 options.
   1. Use **entropy as a function** to evaluate a conflict
   2. Use **variance as a function** to evaluate a conflict
   3. Compare 7a to 7b

Good luck!!!

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