# Network Science

## HW-3 (10 points + 2 bonus points)

Exercise 1 (2 points)

Suppose that similarity between strings is measured using the Hamming distance. There are strings

Which of the strings and is more similar to the string ? Why?

Exercise 2 (2 points)

Suppose that similarity between sets is measured using the Jaccard coefficient. There are sets

Which of the sets and is more similar to the set ? Why?

Exercise 3 (2 points)

Suppose that similarity between strings is measured using the edit distance. There are strings

Which of and is more similar to ? Why?

Exercise 4 (2 points)

Suppose that similarity between vectors is measured using the cosine similarity. There are vectors:

Which of the vectors and is more similar to ? Why?

Exercise 5 (2 points)

Give an example of a network with two communities such that its modularity is .

Exercise 6 (2 points)

Give an example of a network with two communities such that its modularity is at least .