

## Assignment 1

In Chapter 2 of the lecture notes the following two systems of linear equations are considered:

- for all  $i \in \{1, \dots, n\}$

$$s_i = \frac{1 - \sum_{j \neq i} s_j}{2}$$

It is claimed there that this system of  $n$  linear equations has a unique solution  $s_i = \frac{1}{n+1}$  for  $i \in \{1, \dots, n\}$ .

- for all  $i \in \{1, \dots, n\}$

$$s_i = \frac{a - c}{2b} - \frac{\sum_{j \neq i} s_j}{2}.$$

It is claimed that this system of  $n$  linear equations has a unique solution  $s_i = \frac{a-c}{(n+1)b}$  for  $i \in \{1, \dots, n\}$ .

(In both cases the sum is taken over all  $j \in \{1, \dots, n\} \setminus \{i\}$ .) Prove both claims.