Intro to Theory of Computation

COSC 417 Assignment 0

Instructions.

1. Due date and time: see Blackboard.
2. This is a team assignment. Work in teams of 3-4 students. Submit on Blackboard one assignment per team, with the names of all students making the team. The assignment will not be graded.

Task. This is a very simple assignment, whose role is to make you form the teams and to start using Latex (I recommend to use Overleaf.com, as we have discussed in class). Your task is to produce a pdf document using Latex that looks as closely as you can to the image on the next page. Of course, in the header you'll have to add the real names of the team members, and the real current date. If you use the template files from Blackboard, which then this assignment is really easy.

team members names
COSC 336
current date

Assignment 0

Example 1. We define

$$S_n = 1 + 2 + \ldots + n.$$

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We present a proof of this formula without induction. We write S_n in two ways as follows:

$$\begin{aligned} S_n &= 1 + 2 + \ldots + (n-1) + n \\ S_n &= n + (n-1) + \ldots + 2 + 1 \end{aligned}$$

Notice that on the right side we have two rows and n columns. In each column the sum of the two numbers is $n+1$. Indeed, the sum in the first column is $1 + n = n + 1$, in the second column is $2 + (n-1) = n + 1$, and so on.

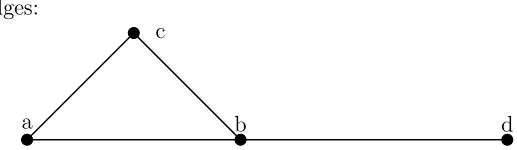
So, if add the two rows we obtain

$$2S_n = (n+1) + (n+1) + \ldots + (n+1) = n \times (n+1).$$

and therefore $S_n = n(n+1)/2$.

Of course, there is also a proof by induction, but it is less fun.

Example 2. The following is a directed graph with 3 vertices and 3 edges:



Example 3. Here is formula involving the greek letters α, β and ϵ:

$$\alpha^2 + \beta^2 = \epsilon^2.$$