

Project 2 (0.2 points)

- *Input:* non-zero natural number n
- *Output:*
 1. the number of associative operations on a set $A = \{a_1, \dots, a_n\}$
 2. the operation table of each associative operation (for $n \leq 4$)

Example:

- *Input:* $n = 2$
- *Output:*
 1. the number of associative operations on a set $A = \{a_1, a_2\}$ is 8
 2. identifying an operation table

	a_1	a_2
a_1	x	y
a_2	z	t

 by the matrix $\begin{pmatrix} x & y \\ z & t \end{pmatrix} \in M_2(A)$, the operation tables of the associative operations on $A = \{a_1, a_2\}$ are given by the matrices:

$$\begin{pmatrix} a_1 & a_1 \\ a_1 & a_1 \end{pmatrix}, \begin{pmatrix} a_1 & a_1 \\ a_1 & a_2 \end{pmatrix}, \begin{pmatrix} a_1 & a_1 \\ a_2 & a_2 \end{pmatrix}, \begin{pmatrix} a_1 & a_2 \\ a_1 & a_2 \end{pmatrix}, \begin{pmatrix} a_1 & a_2 \\ a_2 & a_1 \end{pmatrix}, \begin{pmatrix} a_1 & a_2 \\ a_2 & a_2 \end{pmatrix}, \begin{pmatrix} a_2 & a_1 \\ a_1 & a_2 \end{pmatrix}, \begin{pmatrix} a_2 & a_2 \\ a_2 & a_2 \end{pmatrix}.$$

Note:

- Any (reasonable) programming language may be used.
- The solutions will consist of the source code with comments (do not send executable files!) and at least 5 relevant input and output files, and will be sent to the e-mail address: septimiu.crivei@ubbcluj.ro.
- If necessary, you will be asked to explain your solution.
- The first 25 solutions will be rewarded.
- The final deadline is January 12, 2025.