Práctica 1

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1. $\mathbf{R}^3$ **of** $\mathbf{R} = \{(1,1),(1,2),(2,3),(3,4)\}$

$$\mathrm{R} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}, \mathrm{R}^3 = \mathrm{R} \times \mathrm{R} \times \mathrm{R} \rightarrow \mathrm{R}^3 = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix} \mathrm{x} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix} \mathrm{x} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix},$$

$$\mathrm{R}^3 = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} \mathrm{x} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$$

El resultado es: $\mathrm{R}^3 = \{(1,1),(1,2),(1,3),(1,4)\}$ y podemos comprobarlo con el script *powerrelation.m* :

```
octave:8> powerrelation({['1','1'],['1','2'],['2','3'],['3','4']},3)
ans =
    {
     [1,1] = 11
     [1,2] = 12
     [1,3] = 13
     [1,4] = 14
    }
```

2. **Within the folder "files", find a TEX file in whose content appears the string "\usepackage{amsthm, amsmath}".**

```
$ cd files/
$ grep -n -F "\usepackage{amsthm, amsmath}" *.tex
mainP.tex:6:\usepackage{amsthm, amsmath}
```

Consideremos $L = \{w \in \{a,b\}^* : w \text{ no termina en } ab\}$**. Un expresión regular que genera L es:**

$$L = \{w \in \{a,b\}^* : w = (a+b)^*(aa+ba+bb)\}$$