Theory of automata and Formal languages

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Practice 1

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Exercise 1

Let $R = \{(1,1),(1,2),(2,3),(3,4)\}$ be a binary relation. Exercise 1 asks us to find R^3.
$R^2 = \{(a,b) : \exists x \in A, (a,x) \in R \wedge (x,b) \in R\} = \{(1,1),(1,2),(1,3),(2,4)\}$
$R^3 = \{(a,b) : \exists x \in A, (a,x) \in R^2 \wedge (x,b) \in R\} = \{(1,1),(1,2),(1,3),(1,4)\}$

Checking the answer with Octave:

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