Problem

If R is a regular expression, let $R^{\{m,n\}}$ represent the expression

$$R^m \cup R^{m+1} \cup \cdots \cup R^n.$$

Show how to implement the $R^{\{m,n\}}$ operator, using the ordinary exponentiation operator, but without "· · ·".

Step-by-step solution

Step 1 of 1

Consider the following Regular expression:

$R^m \cup R^{m+1} \cup ... \cup R^n$

Here, user needs to be proved the implementation of $R^{m,n}$ operator with the help of the ordinary operator but without using "…".

This can be proved with the help of computation history.

Computation history is basically the series of configuration that is done by the machine at the time of processing the input.

Turing machine *M* is being considered. If the machine does not halt on the particular input then acceptation and rejection of the string is not done by the Turing machine.

With the help of deterministic machines computation history can be calculated for the particular input.

Thus it can be said that all the states which are there in the Turing machine is basically countable and even the arrangement of the all the symbol present in the tape are countable.

So, the union of the two set in the Turing machine is also said to be countable.

As, it is being proved that all the sequence is countable so exponentiation of this sequence can be written:

$$R^{m,n} = \sum_{m=0}^{n} \cup (A)^n$$

Comment