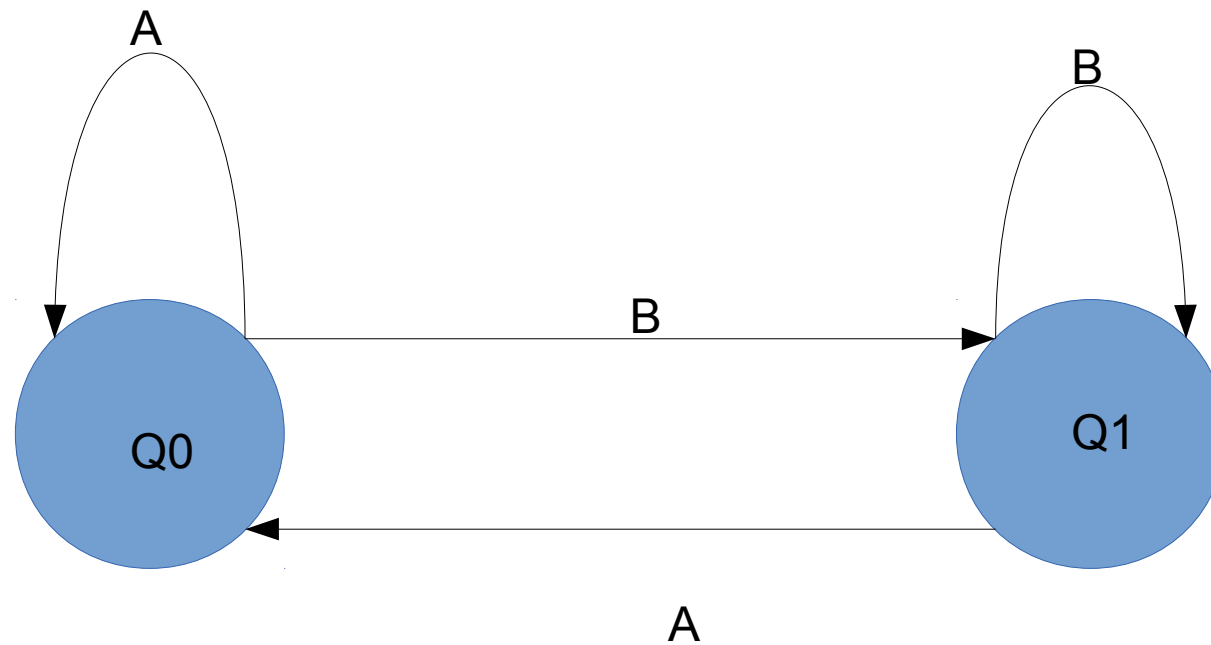DFA for a Regular Expression
to determine if Decimal number
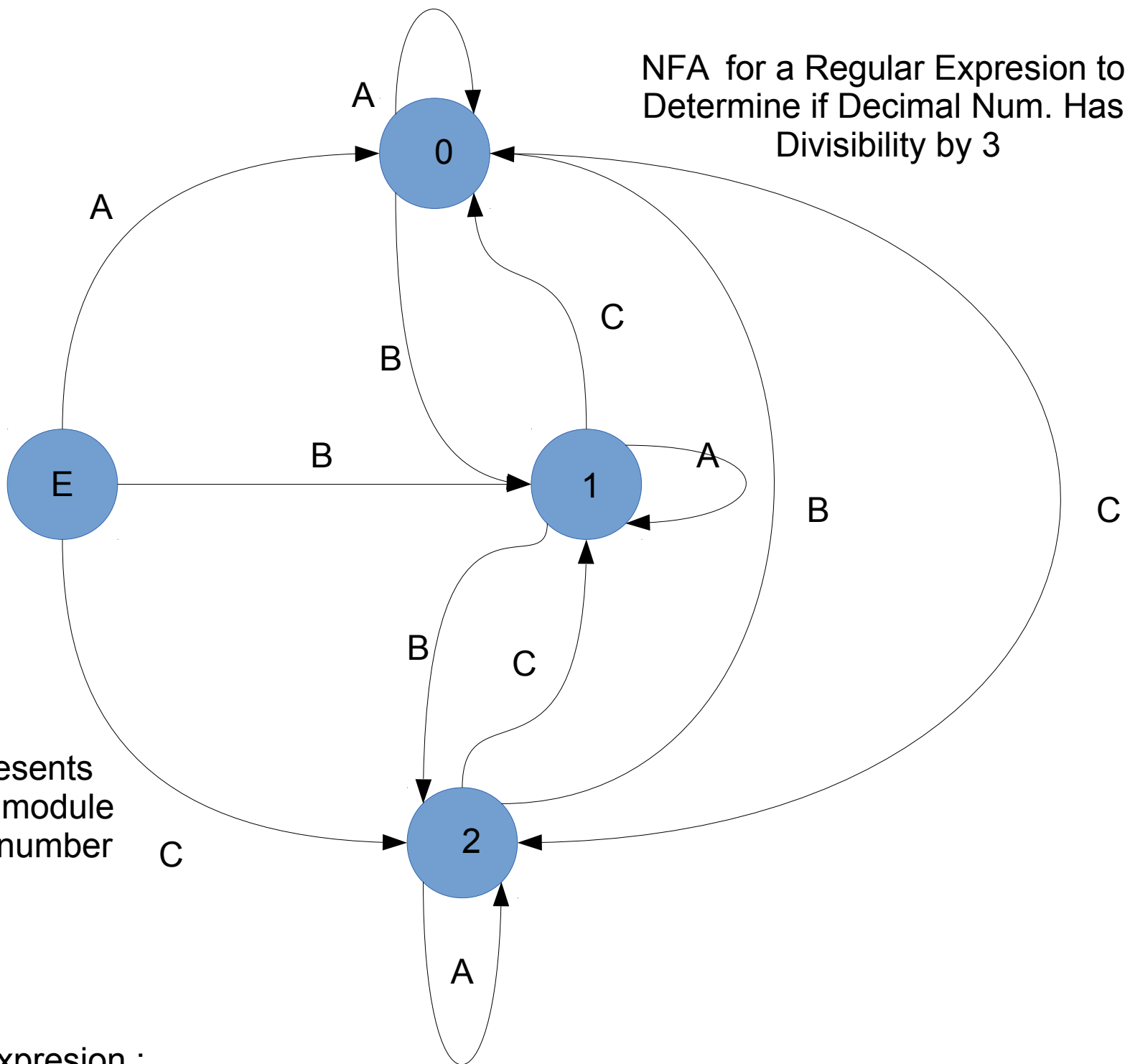is Even

A

B

Q0

B

Q1

A

Regex: [0-9]*[A]+

Where :
A = [0,2,4,6,8]
B = [1,3,5,7,9]

Where:
A = [0,3,6,9]
B = [1,4,7]
C = [2,5,8]

NFA for a Regular Expresion to Determine if Decimal Num. Has Divisibility by 3

Note:
Each state represents
The cumulative module
Result by each number
Inspected

Regular Expresion :
(A|(BA*C)|(((BA*B)|C)(A|(CA*B))*(B|(CA*C))))+

When to use a regular expression(RegEx) or a finite Automaton(FA)?

- The use of a RegEx over the FA is determine by the complexity of the search to be done. Most of the time the execution of a state by state FA that works to a certain end has no need for a RegEx but there are case where the execution of a solution can better work with the scanning process and determine by inspection the outcome.

- For example to determine if a number is divisible by 2,5,or 10 I only need to look at the last number in the sequence to say If the divisibility is possible on this case a RegEx will be more useful than a FA ; But in case of Divisibility by 7,4,3 the need of calculation could make the FA a more plausible procedure than a RegEx , because of the complexity of the expression as result.

- But let us not forget that in fact , for every FA there should be a RegEx and vice-versa So at the end the result of the FA will determine if the RegEx is a more functional procedure (overall in text processing and lexical analysis) or just a non necessary for the task ahead.