**Finite Automata to Regular Expression(transitive Closure method)**

Construct the regular expression for the given finite Automata

0 0,1

1

|  |
| --- |
| Rkij = Rk-1ik (Rk-1kk)\* Rk-1kj + Rk-1ij |

Rules

1. (€+r)\* = r\*
2. w0+0=w0/0w+0=0w
3. 0(0) \*=0\*
4. €(€)\* = €\*
5. €\* can be eliminated when accompanied by any term
6. Any term multiplied by Ø is Ø
7. (00) \* (€+0) -> 0\*



|  |
| --- |
| **K 0 1** |
| R11 0+€ 0\*  R12 1 0\*1  R21 Ø Ø  R22 €+0+1 €+0+1 |

K=1

Rkij = Rk-1ik (Rk-1kk)\* Rk-1kj + Rk-1ij

R111 = R011 (R011)\* R011 + R011

= (€+0) (€+0)\* (€+0)+ (€+0)

W 0 0

= (€+0) (€+0)\* (€+0)

= (€+0) (€+0)\*[r3]

= (€+0)\*

= 0\*

R112 = R011 (R011)\* R012 + R012

= (€+0) (€+0)\*1+1

=(€+0) (€+0)\* 1

= (€+0)\* 1

=0\*1

R121 =R021(R011)\* R011 + R021

= Ø(€+0)\*( €+0) + Ø

= Ø + Ø

|  |
| --- |
| R121 = Ø |

R122 =R021(R011) \* R012 + R022

= Ø(€+0)\* 1+ (€+0+1)

|  |
| --- |
| R122 = €+0+1 |

K =2

R212 =R112(R122) \* R122 + R112

=0\*1(€+0+1)\* (€+0+1)+0\*1

= 0\*1 (€+0+1)\* (€+0+1)

=0\*1(€+0+1)\*

R212 = 0\*1 (0+1)\*