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**CPE 412 Structure of Programming Languages**

**546731**

**B. L = {W ϵ(a,b)\*|W has both ba & ab as substring }**

**L = ϵ\*ba ϵ\* ϵ\*ab ϵ\* + ϵ\*ab ϵ\* ϵ\*ba ϵ\***

**State Diagram:**

**b a**

**a a**

**b b**

**q1 q3 b a q6**

**q5 a,b**

**a b**

**q0 a a b a q8**

**b b**

**q2 q4 q7**

|  |  |  |
| --- | --- | --- |
|  | **a** | **b** |
| **q0** | **q2** | **q1** |
| **q1** | **q3** | **q1** |
| **q2** | **q2** | **q4** |
| **q3** | **q6** | **q5** |
| **q4** | **q5** | **q7** |
| **q5** | **q6** | **q7** |
| **q6** | **q6** | **q8** |
| **q7** | **q8** | **q7** |
| **q8** | **q8** | **q8** |

**Q= q0, q1, q2, q3, q4, q5, q6, q7, q8**

**ϵ = (a,b)**

**Initial State= {q0}**

**Final State = {q8}**

#include<iostream>

using namespace std;

int main() {

int j=0, state=0;

int table[9][2]={{2,1},{3,1},{2,4},{6,5},{5,7},{6,7},{6,8},{8,7},{8,8}};

int input;

int flag=0;

char st[10];

cin>>st;

while(st[j]){

switch (st[j]){

case 'a': input=0;break; //collumn

case 'b': input=1;break; //collumn

}

state=table[state][input];

if (state ==8){flag =1; break;}

j++;

}

if (flag==1){cout<<"accepted";}

else {cout<<"not accepted";}

return 0;

}