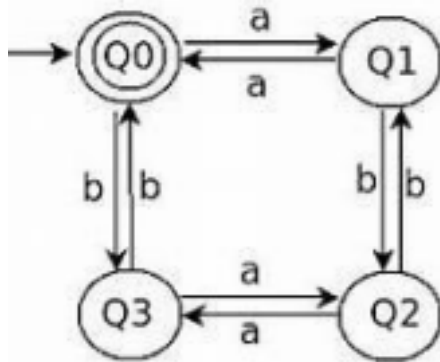


Week 1
Assignment1 Question 2

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DFA $M=(Q,\Sigma,\delta,Q_0,F)$ Where Q =Set of all states $=\{Q_0,Q_1,Q_2,Q_3\}$ Σ =Input Alphabet $=\{a,b\}$,
Start state is Q_0
 F =Set of all final States $=\{Q_0\}$

And the transitions are defined in the transition diagram

Algorithm: Language recognizer

Input:

input //input string

Output:

Algorithm prints a message

“String accepted”: If the input is acceptable by the language,

“String not accepted” otherwise,

“Invalid token”: If the input string contains symbols other than input alphabet.

Method:

state=0 //initial state

i=0

while((current=input[i++])!='\0'){

switch(state)

case 0: if(current=='a') state=1;

else if(current=='b') state=2;

else

Print "Invalid token" ; exit;

case 1: if(current=='a') state=0;

else if(current=='b') state=3;

else

Print "Invalid token" ; exit;

case 2: if(current=='a') state=3;

else if(current=='b') state=0;

else

```

Print "Invalid token" ; exit;
case 3: if(current=='a') state=2;
else if(current=='b') state=1;
else
Print "Invalid token" ; exit;
end switch
end while
//Print output
if(state==0)
Print "String accepted"
else
Print "String not accepted"

```

Test cases:

Input	Output
bbaabb	String accepted
ababa	String not accepted
aaabb	String not accepted
aaaa	String accepted
abcdefg	Invalid token

C Code

```

#include<stdio.h>
void main(){
int state=0,i=0;
char current,input[20];
printf("Enter input string \t :");
scanf("%s",input);
while((current=input[i++])!='\0'){
switch(state)
{
case 0: if(current=='a')
state=1;
else if(current=='b')
state=3;
else
{
printf("Invalid token"); exit(0);
}
break;

```

```

case 1: if(current=='a')
state=0;
else if(current=='b')
state=3;
else
{
printf("Invalid token"); exit(0);
}
break;
case 2: if(current=='a')
state=3;
else if(current=='b')
state=0;
else
{
printf("Invalid token"); exit(0);
}
break;
case 3: if(current=='a')
state=2;
else if(current=='b')
state=1;
else
{
printf("Invalid token");
exit(0);
}
break;
}
if(state==0)
printf("\n\nString accepted\n\n");
else
printf("\n\nString not accepted\n\n");
}

```

Test cases:

Input 1	Output
Input 2	Output
Input 3	Output
Input 4	Output