COMPILER DESIGN LAB
WEEK 1

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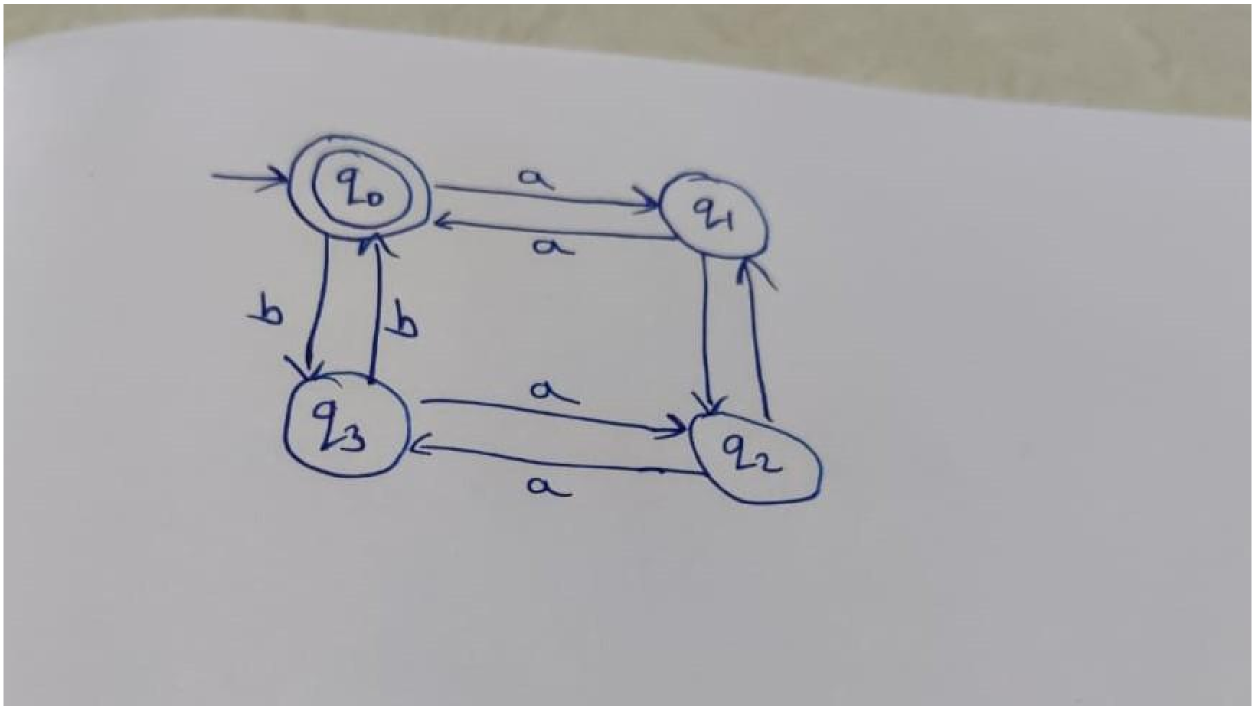
Program 1:
Implement a language recogniser which accepts set of all strings over the alphabet



∑={a,b} containing an even number of a’s and an even number of b’s.
Description:
The acceptable strings of the language are ε(Null string), aa, bb, abba, babbab etc.
Deterministic Finite Automata for the given language is given below:

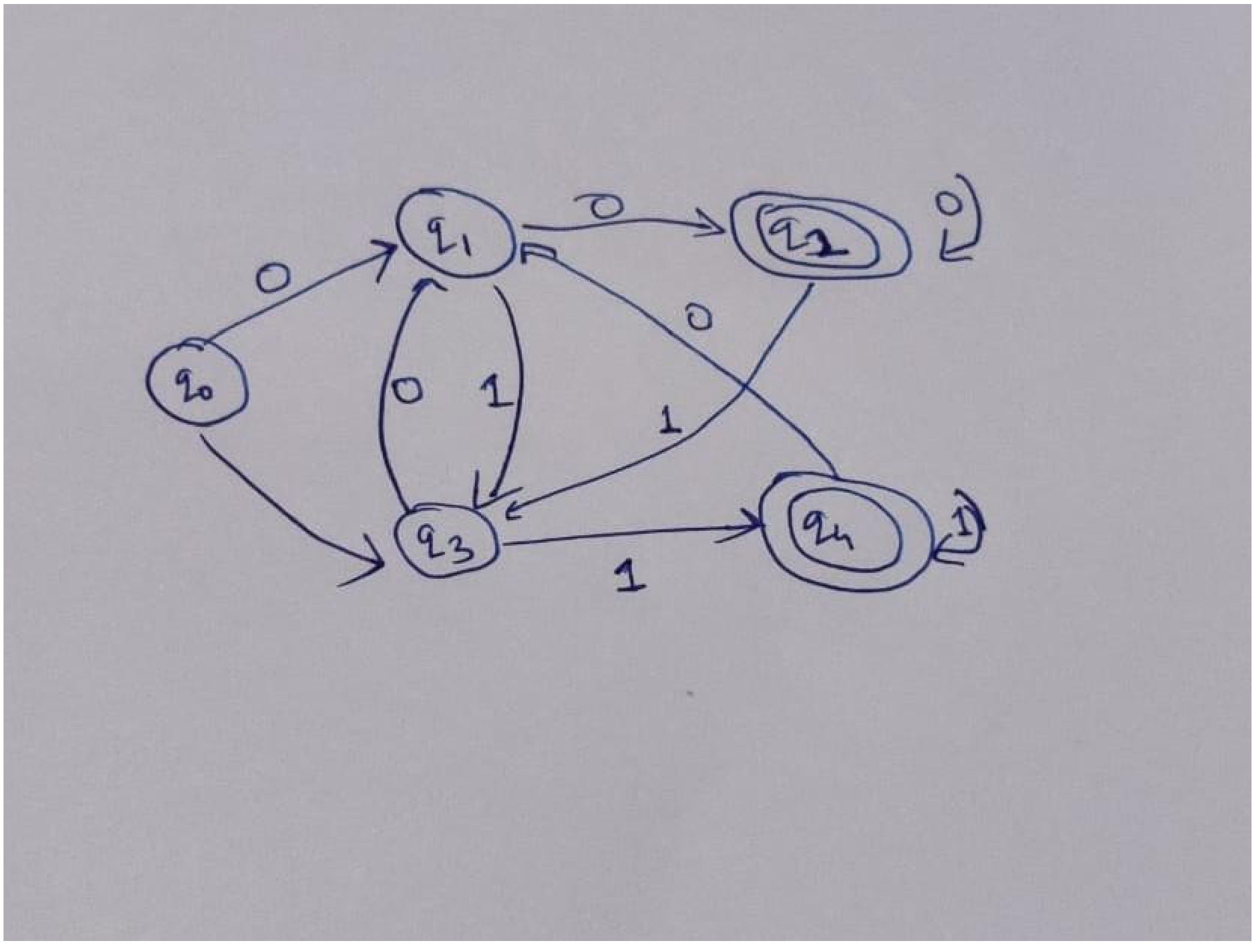
DFA M=(Q,∑,δ,Q0,F) Where
Q=Set of all states ={Q0,Q1,Q2,Q3}
∑=Input Alphabet={a,b},
Start state is Q0
F=Set of all final States={ Q0}
And the transitions are defined in
the transition diagram

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=2;
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");
}
```

Program 2-
Implementation of Language recognizer for set of all strings ending with two symbols of
same type.



Description:
The acceptable strings of the language are ε(Null string), aa, bb, aaaaabbbb, babbabb etc.
Non Acceptable String are aaaaaaaba bbbbbbbaba abababab etc
Deterministic Finite Automata for the given language is given above:
DFA M=(Q,∑,δ,Q0,F) Where
Q=Set of all states ={Q0,Q1,Q2,Q3,Q4}

∑=Input Alphabet={a,b},
Start state is Q0
F=Set of all final States={ Q2,Q4}
And the transitions are defined in
the transition diagram

C CODE

```
#include<stdio.h>
void main()
{
    int state=0,i=0;
    char token,input[20];
    printf("Enter input string:\t");
    scanf("%s",input);
    //printf("Given string is : %s");

    while((token=input[i++])!='\0')
    {
       // printf("current token : %c \n",token);
        switch(state)
        {
            case 0: if(token=='a')
                        state=1;
                    else if(token=='b')
                        state=3;
                    else
                    {
                        printf("Invalid token");
                        exit(0);
                    }
                    break;
            case 1: if(token=='a')
        state=2;
     else if(token=='b')
        state=3;
     else
     {
        printf("Invalid token");
        exit(0);
     }

     break;
case 2: if(token=='a')
        state=2;
     else if(token=='b')
        state=3;
     else
     {
        printf("Invalid token");
        exit(0);
     }
     break;
case 3: if(token=='a')
        state=1;
     else if(token=='b')
        state=4;
     else
     {
        printf("Invalid token");
        exit(0);
     }
case 4: if(token=='a')
        state=1;
     else if(token=='b')
```

```
                        state=4;
                    else
                    {
                        printf("Invalid token");
                        exit(0);
                    }
                    break;
        }
       // printf("state = %d  ",state);
    }
    if(state==0||state==2||state==4)
        printf("\n\nString accepted\n\n");
    else
        printf("\n\nString not accepted\n\n");
}
```