

Compiler Design

Weekly Lab -1

- 1) Implement a language recogniser which accepts set of all strings over the alphabet $\Sigma=\{a,b\}$ 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:

Code : (C program)

```
#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 ( s t a t e ) {
            case 0: if ( c u r r e n t == 'a') s t a t e = 1;
                    else if(c u r r e n t == 'b') s t a t e = 2;
                    else {printf("In v a l i d t o k e n " );
                        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
        }
    }
}
```

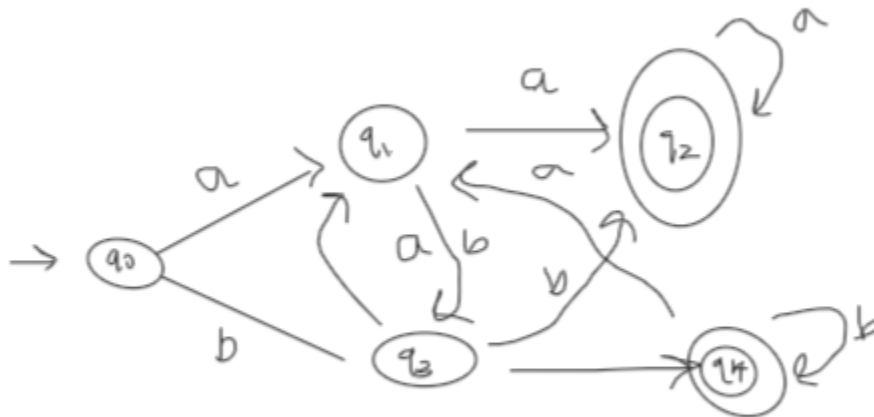
2) Implementation of Language recognizer for set of all strings ending with two symbols of same type

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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 below:



DFA : $M=(Q,\Sigma,\delta,Q_0,F)$

Where Q =Set of all states $=\{Q_0,Q_1,Q_2,Q_3,Q_4\}$

Σ =Input Alphabet $=\{a,b\}$,

Start state is Q_0

F =Set of all final States $=\{Q_2,Q_4\}$

Code: (C Program)

```
#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");
}
```