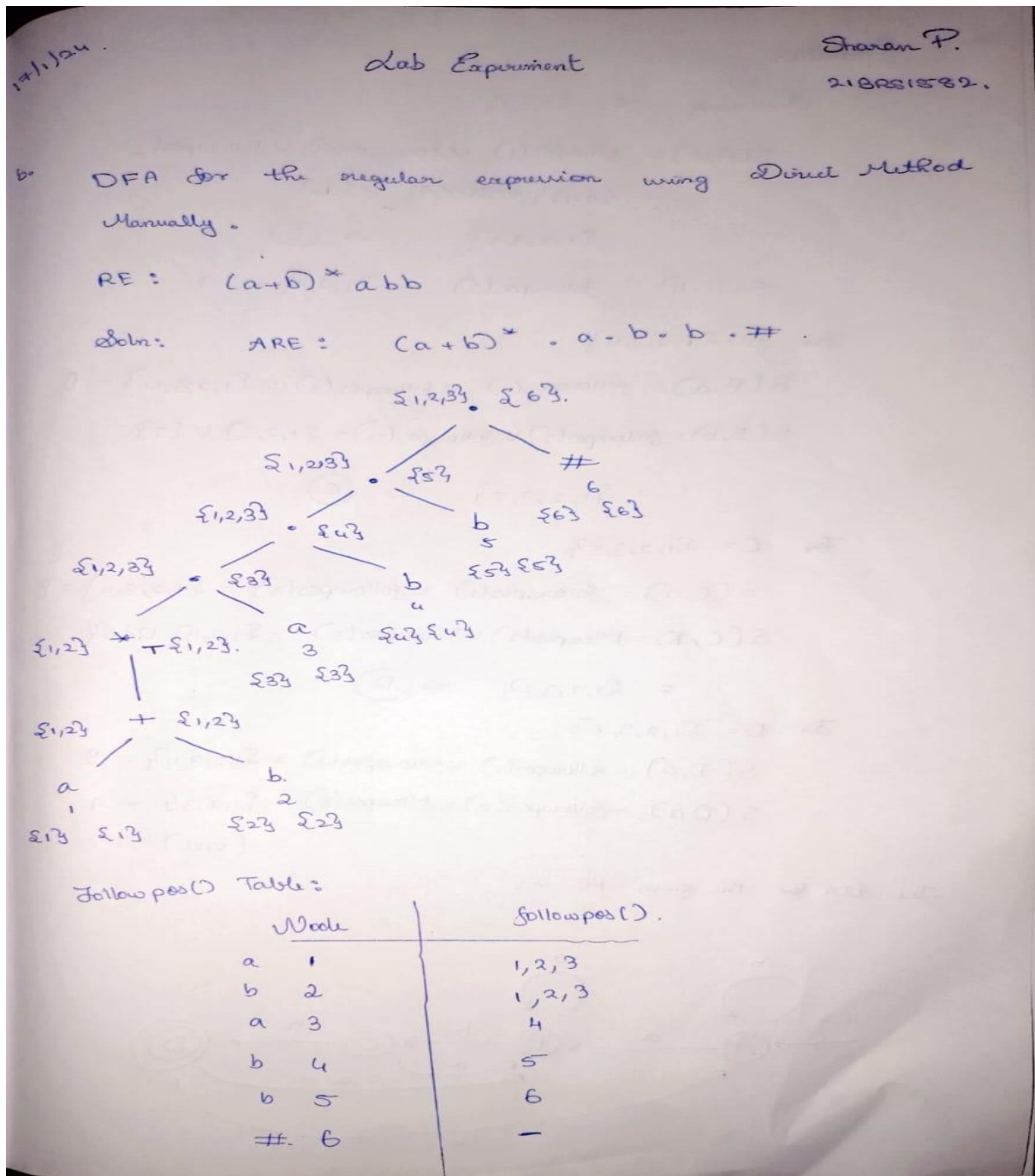# LAB ASSIGNMENT (17-01-2024)

Name: Sharan P   **Reg.No:** 21BRS1582

Aim: To construct a DFA in C for the given RE: (a+b)*abb

DFA Construction:

Production:

Assuming $A = \{1,2,3\}$

$\delta(A,a) = followpos(1) \cup followpos(2) \cup followpos(3)$

$= \{1,2,3\} \cup \{1,2,3\} \cup \{4\}.$

$= \{1,2,3,4\} \quad\quad \Rightarrow \quad \boxed{B}$

$\delta(A,b) = followpos(2) \quad = \{1,2,3\} = A.$

For $B = \{1,2,3,4\}$

$\delta(B,a) = followpos(1) \cup followpos(3) = \{1,2,3,4\} = B$

$\delta(B,b) = followpos(2) \cup followpos(4) = \{1,2,3\} \cup \{5\}$

$= \{1,2,3,5\} \quad \Rightarrow \quad \textcircled{C}$

For $C = \{1,2,3,5\},$

$\delta(C,a) = followpos(1) \cup followpos(3) = \{1,2,3,4\} = B$

$\delta(C,b) = followpos(2) \cup followpos(5) = \{1,2,3\} \cup \{6\}$

$= \{1,2,3,6\} \quad \Rightarrow \quad \textcircled{D}$

For $D = \{1,2,3,6\}$

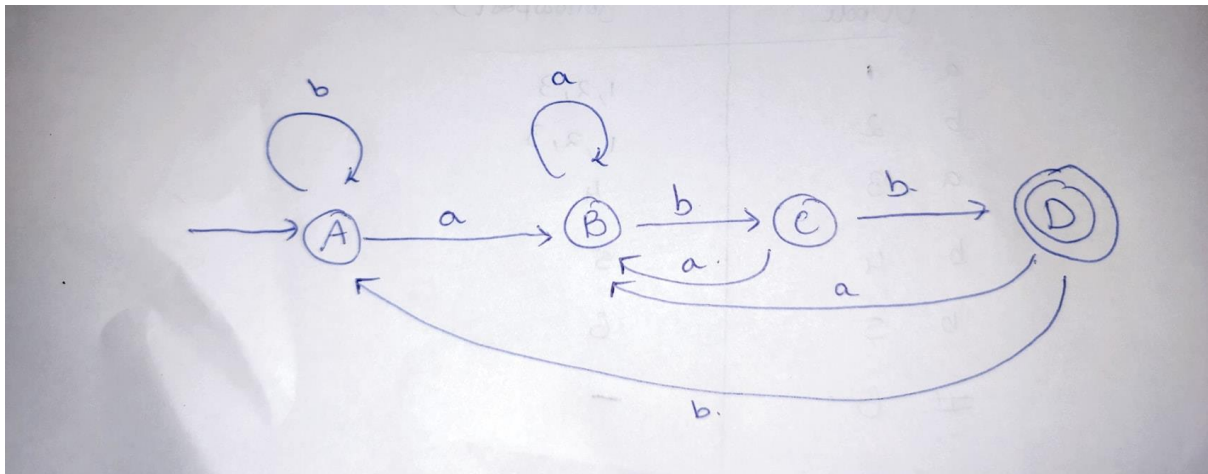$\delta(D,a) = followpos(1) \cup followpos(3) = \{1,2,3,4\} = B.$

$\delta(D,b) = followpos(2) \cup followpos(6) = \{1,2,3\} - A.$

(end).

The DFA for the given RE is:
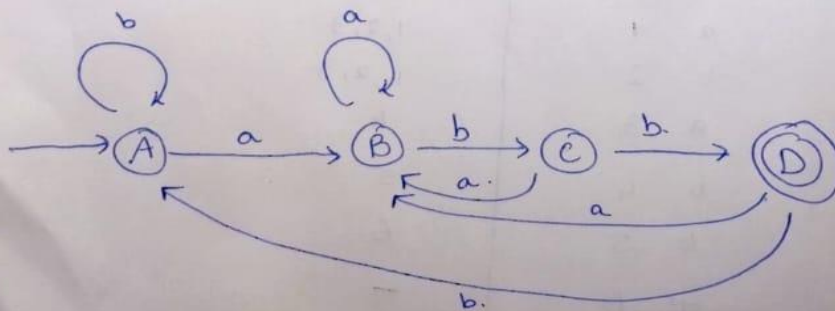
Final DFA :

Code:

```c
#include<stdio.h>

int production(int states,int inputchar){
        switch(states){
                case 0:
                        if(inputchar=='a') return 1;
                        else return 0;
                        break;
                case 1:
                        if(inputchar=='a') return 1;
                        else return 2;
                        break;
                case 2:
                        if(inputchar=='a') return 1;
                        else return 3;
                        break;
                case 3:
                        if(inputchar=='a') return 1;
                        else return 0;
                        break;

        }

}

int main(){
        int states=0;
        char inputString[100];
    printf("Enter a string: ");
    scanf("%99s", inputString);
```

```
    for(int i=0;inputString[i]!='\0';++i){
        states= production(states,inputString[i]);
        }
        if(states==3) printf("String Accepted");
        else printf("String Not Accepted");

        return 0;
}
```

Output ScreenShot:

Result:

A DFa for the given Regular expression is made using the Direct method and is developed in the c code. The strings "aabb" and "aabbabab" are both validated with the later failing the acceptance.