

**Department of Computer Science and Engineering, SVNIT Surat**  
**System Software**  
**Assignment – 3**

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**Problem Statement:**

**1. Write a C program to recognize strings under 'a\*', 'a\*b+'.**

**Solution:**

```
#include <stdio.h>
#include <conio.h>
#include <stdlib.h>
#include <string.h>
void main()
{
    char s[1000], c;
    int next_state = 0, i = 0, l = 0;
    printf("For empty string enter e.");
    printf("\nEnter a string: ");
    scanf("%s", s);
    l = strlen(s);
    while (s[i] != '\0')
    {
        switch (next_state)
        {
            case 0:
            {
                c = s[i++];
                if (c == 'a')
                    next_state = 0;
                else if (c == 'b')
                    next_state = 1;
                else if (c == 'e')
                    next_state = 3;
                else
                    next_state = 2;
                break;
            }
            case 1:
            {
```

```

        c = s[i++];
        if (c == 'a')
            next_state = 2;
        else if (c == 'b')
            next_state = 1;
        else
            next_state = 2;
        break;
    }
case 2:
{
    c = s[i++];
    if (c == 'a')
        next_state = 2;
    else if (c == 'b')
        next_state = 2;
    else
        next_state = 2;
    break;
}
case 3:
{
    c = s[i++];
    if (c == 'a')
        next_state = 2;
    else if (c == 'b')
        next_state = 2;
    else
        next_state = 2;
    break;
}
case 4:
{
    printf("\n%s is not recognised under rule a* or a*b+", s);
    exit(0);
}
}

if ((next_state == 0) || (next_state == 3))
    printf("\n%s is accepted under rule a*", s);

```

```
else if ((next_state == 1))
    printf("\n%s is accepted under rule a*b+", s);
else
    printf("\n%s is not accepted under any rule", s);
}
```

Output:

```
PS D:\C Programs (VS Code)\SS> gcc t.c
PS D:\C Programs (VS Code)\SS> ./a
For empty string enter e.
Enter a string: e

e is accepted under rule a*
PS D:\C Programs (VS Code)\SS> ./a
For empty string enter e.
Enter a string: aaaa

aaaa is accepted under rule a*
PS D:\C Programs (VS Code)\SS> ./a
For empty string enter e.
Enter a string: b

b is accepted under rule a*b+
PS D:\C Programs (VS Code)\SS> ./a
For empty string enter e.
Enter a string: aabbb

aabbb is accepted under rule a*b+
PS D:\C Programs (VS Code)\SS> ./a
For empty string enter e.
Enter a string: baaa

baaa is not accepted under any rule
PS D:\C Programs (VS Code)\SS> ./a
For empty string enter e.
Enter a string: aba

aba is not accepted under any rule
```