1.#include <stdio.h>

#include <string.h>

int main() {

    char s[100];

    printf("Enter string: "); scanf("%s", s);

    if(s[0]=='a' && s[strlen(s)-1]=='a')

        printf("Accepted\n");

    else

        printf("Rejected\n");

    return 0;

}

Output:

Enter string: abaaaa

Accepted

=== Code Execution Successful ===

2.#include <stdio.h>

#include <string.h>

int main() {

    char s[100];

    printf("Enter string: "); scanf("%s", s);

    if(s[0]=='0' && s[strlen(s)-1]=='1')

        printf("Accepted (NFA)\n");

    else

        printf("Rejected (NFA)\n");

    return 0;

}

Output:

Enter string: 011

Accepted (NFA)

=== Code Execution Successful ===

3.#include <stdio.h>

```
#define STATES 4
int eps[STATES][STATES] = {
    {0,1,0,0},
    {0,0,0,0},
    {0,0,0,1},
    {0,0,0,0}
};
int visited[STATES];
void enclosure(int state) {
    if(visited[state]) return;
    visited[state] = 1;
    for(int i=0;i<STATES;i++)
        if(eps[state][i]) eclosure(i);
}
int main() {
    for(int s=0;s<STATES;s++){
        for(int i=0;i<STATES;i++) visited[i]=0;
        eclosure(s);
        printf("ε-closure(q%d): ", s);
        for(int i=0;i<STATES;i++) if(visited[i]) printf("q%d ", i);
        printf("\n");
    }
    return 0;
}
```

Output:

ε-closure(q0): q0 q1

ε-closure(q1): q1

ε-closure(q2): q2 q3

ε-closure(q3): q3

=== Code Execution Successful ===

4.#include <stdio.h>

#include <string.h>

int checkA(char *s, int i);

int checkS(char *s, int i) {

    if(s[i]=='0') {

        i = checkA(s, i+1);

        if(s[i]=='1') return i+1;

    }

    return -1;

}

int checkA(char *s, int i) {

    if(s[i]=='0' || s[i]=='1')

        return checkA(s, i+1);

    return i; // ε

}

int main() {

    char str[100];

    printf("Enter string: "); scanf("%s", str);

    int res = checkS(str,0);

    if(res == strlen(str) && res != -1) printf("Accepted\n");

    else printf("Rejected\n");

}

Output:

Enter string: 01101

Rejected

=== Code Execution Successful ===

5.#include <stdio.h>

#include <string.h>

```
int checkS(char *s, int i, int n) {
    if(i==n) return i; // ε
    if(n-i==1 && (s[i]=='0'||s[i]=='1')) return i+1;
    if(s[i]=='0' && s[n-1]=='0') return checkS(s, i+1, n-1);
    if(s[i]=='1' && s[n-1]=='1') return checkS(s, i+1, n-1);
    return -1;
}
int main() {
    char str[100];
    printf("Enter string: "); scanf("%s", str);
    int res = checkS(str,0,strlen(str));
    if(res == strlen(str) && res != -1) printf("Accepted\n");
    else printf("Rejected\n");
}
```

Output:

Enter string: 1001

Rejected

=== Code Execution Successful ===