1. Write a C program to simulate a Deterministic Finite Automata (DFA) for the given language representing strings that start with a and end with a

AIM: To write a C program to simulate a Deterministic Finite Automata (DFA) for the given language representing strings that start with a and end with a

**ALGORITHEM:**

Initialize DFA State:

Set the initial state of the DFA to the start state (e.g., State 0).

Process Input String:

For each character in the input string:

Use a transition function to determine the next state based on the current state and the input character.

If the transition is valid, update the current state; otherwise, consider the string as invalid.

Check Final State:

After processing the entire string, check if the DFA is in the final accepting state (e.g., State 2 in this case).

If the DFA is in the final state, the input string is accepted.

If the DFA is not in the final state, the input string is rejected.

**PROGRAM:**

#include <stdio.h>

#include <stdbool.h>

int dfa(char input) {

static int state = 0;

switch (state) {

case 0:

if (input == 'a') {

state = 1;

} else {

state = -1;

}

break;

case 1:

if (input == 'a') {

state = 2;

} else {

state = -1;

}

break;

case 2:

state = -1;

break;

default:

state = -1;

break;

}

return state;

}

int main() {

char inputString[100];

printf("Enter a string: ");

scanf("%s", inputString);

int i = 0;

while (inputString[i] != '\0') {

if (dfa(inputString[i]) == -1) {

printf("Invalid string\n");

return 0;

}

i++;

}

if (dfa('\0') == 2) {

printf("Valid string\n");

} else {

printf("Invalid string\n");

}

return 0;

}

**OUTPUT:**

