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.

Program:

#include <stdio.h>

#include <stdbool.h>

int dfa\_transition(int state, char input) {

switch (state) {

case 0:

if (input == 'a') return 1;

else return 0;

case 1:

if (input == 'a') return 1;

else return 2;

case 2:

return 2;

}

return -1;

}

int main() {

int current\_state = 0;

char input\_string[100];

printf("Enter an input string: ");

scanf("%s", input\_string);

for (int i = 0; input\_string[i] != '\0'; i++) {

current\_state = dfa\_transition(current\_state, input\_string[i]);

if (current\_state == -1) {

printf("Invalid input string.\n");

return 0;

}

}

if (current\_state == 1) {

printf("Accepted: The input string starts with 'a' and ends with 'a'.\n");

} else {

printf("Rejected: The input string does not satisfy the language.\n");

}

return 0;

}

