Write a program to implement a basic calculator. The program should prompt the user for two numbers and an operator (+, -, \*, /), and then perform the operation and display the result. The program should continue to prompt the user for input until they choose to quit.

#include <stdio.h>

int main() {

    double num1, num2;

    char op;

    while (1) {

        printf("Enter an operator (+, -, \*, /) or q to quit: ");

        scanf(" %c", &op);

        if (op == 'q') {

            break;

        }

        printf("Enter two numbers: ");

        scanf("%lf %lf", &num1, &num2);

        switch(op) {

            case '+':

                printf("%.2lf + %.2lf = %.2lf\n", num1, num2, num1 + num2);

                break;

            case '-':

                printf("%.2lf - %.2lf = %.2lf\n", num1, num2, num1 - num2);

                break;

            case '\*':

                printf("%.2lf \* %.2lf = %.2lf\n", num1, num2, num1 \* num2);

                break;

            case '/':

                if (num2 == 0) {

                    printf("Error: division by zero\n");

                } else {

                    printf("%.2lf / %.2lf = %.2lf\n", num1, num2, num1 / num2);

                }

                break;

            default:

                printf("Error: invalid operator\n");

                break;

        }

    }

    return 0;

}

***Explanation***

In this program, we define two **double** variables (**num1** and **num2**) to store the user's input, and a **char** variable (**op**) to store the operator. We use a **while** loop to continue prompting the user for input until they choose to quit by entering 'q'.

Within the loop, we prompt the user for the operator and numbers using **printf()** and **scanf()**. We then use a **switch** statement to perform the appropriate operation based on the operator entered, and display the result using **printf()**. If the user enters an invalid operator or tries to divide by zero, we display an error message instead of performing the operation.

Overall, this program provides a simple implementation of a calculator using **switch** statements and basic arithmetic operations. It allows the user to perform addition, subtraction, multiplication, and division, and provides error messages for cases such as dividing by zero or entering an invalid operator. With less than 100 lines of code, it provides a good example of how C can be used to implement a basic computational tool.