#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#define MAX 100

typedef struct {

   char history[MAX][100];

   int top;

} Stack;

void push(Stack \*s, char \*entry) {

   if (s->top == MAX - 1) {

       printf("History stack is full!'n");

   } else {

       s->top++;

       strcpy(s->history[s->top], entry);

   }

}

void displayHistory(Stack \*s) {

   if (s->top == -1) {

       printf("No calculation history.'n");

   } else {

       printf("'n--- Calculation History ---'n");

       for (int i = s->top; i >= 0; i--) {

           printf("%s'n", s->history[i]);

       }

   }

}

void clearHistory(Stack \*s) {

   s->top = -1;

   printf("History cleared.'n");

}

int main() {

   Stack s;

   s.top = -1;

   int choice;

   float num1, num2, result;

   char op;

   char record[100];

   do {

       printf("'n--- Simple Calculator with History ---'n");

       printf("1. Perform Calculation'n");

       printf("2. View History'n");

       printf("3. Clear History'n");

       printf("4. Exit'n");

       printf("Enter your choice: ");

       scanf("%d", &choice);

       switch (choice) {

       case 1:

           printf("Enter first number: ");

           scanf("%f", &num1);

           printf("Enter operator (+, -, \*, /): ");

           scanf(" %c", &op);

           printf("Enter second number: ");

           scanf("%f", &num2);

           switch (op) {

           case '+':

               result = num1 + num2;

               printf("Result: %.2f'n", result);

               break;

           case '-':

               result = num1 - num2;

               printf("Result: %.2f'n", result);

               break;

           case '\*':

               result = num1 \* num2;

               printf("Result: %.2f'n", result);

               break;

           case '/':

               if (num2 != 0) {

                   result = num1 / num2;

                   printf("Result: %.2f'n", result);

               } else {

                   printf("Error: Division by zero!'n");

                   continue;

               }

               break;

           default:

               printf("Invalid operator!'n");

               continue;

           }

           snprintf(record, sizeof(record), "%.2f %c %.2f = %.2f", num1, op, num2, result);

           push(&s, record);

           break;

       case 2:

           displayHistory(&s);

           break;

       case 3:

           clearHistory(&s);

           break;

       case 4:

           printf("Exiting calculator. Goodbye!'n");

           break;

       default:

           printf("Invalid choice!'n");

       }

   } while (choice != 4);

   return 0;

}