Exp. No. 16

Write a C Program to Generate the Three address code representation for the given input statement.

Program:

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

struct three {
   char data[10], temp[7];
} s[30];

int main() {
   char d1[7], d2[7] = "t";
   int i = 0, j = 1, len = 0;
   FILE *f1, *f2;

   // Open input and output files
   f1 = fopen("sum.txt", "r");
   f2 = fopen("out.txt", "w");

   if (f1 == NULL || f2 == NULL) {
      printf("Error opening files!\n");
      return 1;
   }

   // Read the input into the structure
   while (fscanf(f1, "%s", s[len].data) != EOF) {
      len++;
   }

   // Generate first temporary variable
   sprintf(d1, "%d", j);
   strcat(d2, d1);
   strcpy(s[j].temp, d2);

   // Reset `d1` and `d2` for reuse
   strcpy(d1, "");
   strcpy(d2, "t");
```

```
    // First operation
    if (!strcmp(s[3].data, "+")) {
        fprintf(f2, "%s = %s + %s", s[j].temp, s[i + 2].data, s[i + 4].data);
    } else if (!strcmp(s[3].data, "-")) {
        fprintf(f2, "%s = %s - %s", s[j].temp, s[i + 2].data, s[i + 4].data);
    }
    j++;

    // Process the rest of the operations
    for (i = 4; i < len - 2; i += 2) {
        sprintf(d1, "%d", j);
        strcat(d2, d1);
        strcpy(s[j].temp, d2);

        if (!strcmp(s[i + 1].data, "+")) {
            fprintf(f2, "\n%s = %s + %s", s[j].temp, s[j - 1].temp, s[i + 2].data);
        } else if (!strcmp(s[i + 1].data, "-")) {
            fprintf(f2, "\n%s = %s - %s", s[j].temp, s[j - 1].temp, s[i + 2].data);
        }

        // Reset `d1` and `d2` for the next iteration
        strcpy(d1, "");
        strcpy(d2, "t");
        j++;
    }

    // Final assignment statement
    fprintf(f2, "\n%s = %s", s[0].data, s[j - 1].temp);

    // Close files
    fclose(f1);
    fclose(f2);

    printf("Three-address code generated successfully in 'out.txt'.\n");

    return 0;
}
```

Output:

Input:sum.txt

a = 5 + 3 - 2 + 8