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Experiment No. 1

Aim: PROGRAM USING STRUCTURE

Theory:

1. Structure Definition: The struct student holds the name, ID, and marks.

2. Input Handling: Loop through N students and take input for each.

3. Bubble Sort: Sort students alphabetically by their names using strcmp().

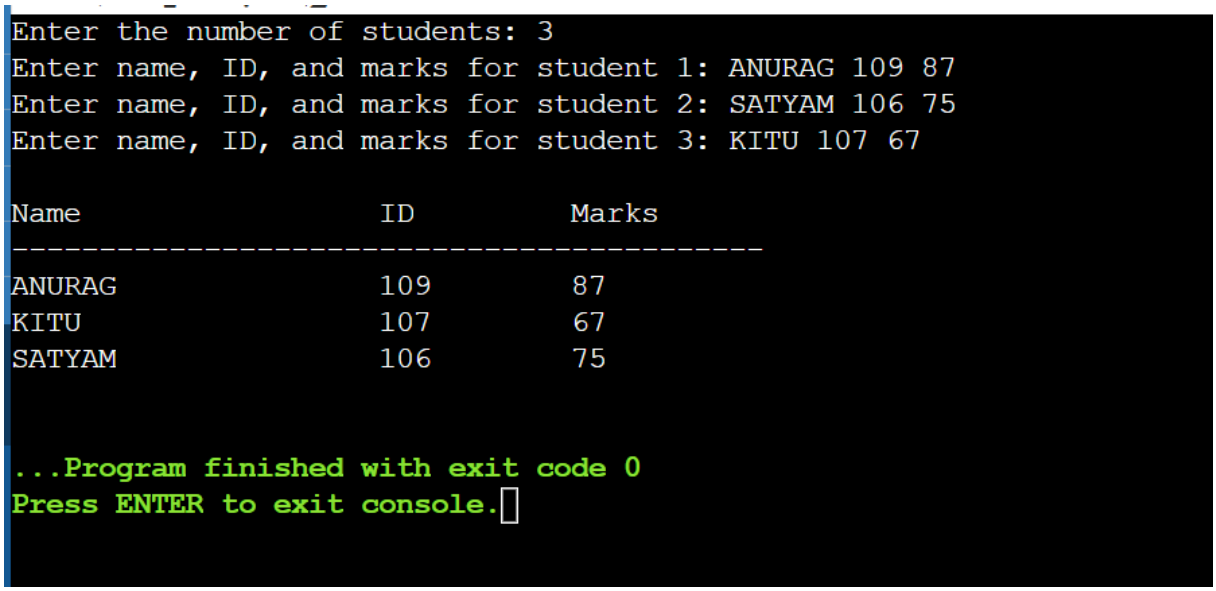
4. Output: Print the sorted list of students in a formatted way.

Program:

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

struct student {
   char sname[40];
   char sid[10];
   int marks;
};

int main() {
   int N, i, j;
   char tempName[40];
   char tempId[10];
   int tempMarks;

   struct student str[30];

   printf("Enter the number of students: ");
   scanf("%d", &N);

   for (i = 0; i < N; i++) {
      printf("Enter name, ID, and marks for student %d: ", i + 1);
      scanf("%s %s %d", str[i].sname, str[i].sid, &str[i].marks);
   }

   for (i = 0; i < N - 1; i++) {
      for (j = 0; j < N - i - 1; j++) {
         if (strcmp(str[j].sname, str[j + 1].sname) > 0) {

            strcpy(tempName, str[j].sname);
            strcpy(str[j].sname, str[j + 1].sname);
            strcpy(str[j + 1].sname, tempName);

            strcpy(tempId, str[j].sid);
            strcpy(str[j].sid, str[j + 1].sid);
            strcpy(str[j + 1].sid, tempId);
```

```
            tempMarks = str[j].marks;
            str[j].marks = str[j + 1].marks;
            str[j + 1].marks = tempMarks;
        }
      }
    }

    printf("\n%-20s %-10s %s\n", "Name", "ID", "Marks");
    printf("----------------------------------------\n");
    for (i = 0; i < N; i++) {
       printf("%-20s %-10s %d\n", str[i].sname, str[i].sid, str[i].marks);
    }

    return 0;
}
```

Output:



Conclusion:

This program demonstrates how to use structures in C to store and manage multiple data fields (name, ID, and marks) for students. By implementing a bubble sort algorithm, the program sorts the student records alphabetically by their names. This exercise highlights key concepts such as:

Structures: A way to group related data of different types.

Arrays of Structures: Handling multiple records efficiently.

String Manipulation: Using functions like strcpy() and strcmp() for string operations.

Sorting Algorithms: Applying a basic sorting algorithm (Bubble Sort) for arranging data.

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