

Assignment

1)

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

typedef struct
{
    char name[21];
    char rollno[5];
    int score;
} STUDENT;

int compareStudents(void *rec1, void *rec2)
{
    STUDENT *s1 = (STUDENT *)rec1;
    STUDENT *s2 = (STUDENT *)rec2;
    return ("%d", strcmp(s1->rollno, s2->rollno));
}

int main()
{
    int n, m;
    STUDENT *rec1, *rec2;
    rec1 = (STUDENT *)malloc(sizeof(STUDENT));
    rec2 = (STUDENT *)malloc(sizeof(STUDENT));
    printf("Student 1: ");
    scanf("%s %s %d", rec1->name, rec1->rollno, &rec1->score);
    printf("Student 2: ");
    scanf("%s %s %d", rec2->name, rec2->rollno, &rec2->score);

    printf("%d\n", compareStudents(rec1, rec2));

    return 0;
}
```

2)

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

typedef struct
{
    char name[21];
    char rollno[5];
    int score;
```

```

} STUDENT;

int compareStudents(void *rec1, void *rec2)
{
    STUDENT *s1 = (STUDENT *)rec1;
    STUDENT *s2 = (STUDENT *)rec2;
    return ("%d", strcmp(s1->rollno, s2->rollno));
}

int main()
{
    int n, m, i, j, l, k = 0, flag;

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

    STUDENT *studentArray = (STUDENT *)malloc(n * sizeof(STUDENT));

    for (i = 0; i < n; i++)
    {
        printf("Student %d: ", i + 1);
        scanf("%s %s %d", studentArray[i].name, studentArray[i].rollno,
&studentArray[i].score);
    }

    for (i = 0; i < n; i++)
    {
        flag = 0;
        for (j = 0; j < n - i - 1; j++)
        {
            if (compareStudents(&studentArray[j], &studentArray[j + 1]) > 0)
            {
                STUDENT tempData = studentArray[j];
                studentArray[j] = studentArray[j + 1];
                studentArray[j + 1] = tempData;
                flag = 1;
            }
        }
        if (flag == 0)
        {
            break;
        }
    }

    printf("Sorted Array of Students:\n");
    for (i = 0; i < 3; i++)
    {

```

```

        printf("%s %s %d\n", studentArray[i].name, studentArray[i].rollno,
studentArray[i].score);
    }

    return 0;
}

```

3)

```

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

typedef struct
{
    char name[21];
    char roll[5];
    int num;
    struct STUDENT *next;
} STUDENT;

int compareStudents(void *rec1, void *rec2)
{
    STUDENT *s1 = (STUDENT *)rec1;
    STUDENT *s2 = (STUDENT *)rec2;

    int roll1 = atoi(s1->roll);
    int roll2 = atoi(s2->roll);

    if (roll1 > roll2)
    {
        return 1;
    }
    else if (roll1 < roll2)
    {
        return -1;
    }
    else
    {
        return 0;
    }
}

void insertStudent(STUDENT **head, STUDENT *newStudent)
{
    if (*head == NULL || compareStudents(newStudent, *head) < 0)
    {

```

```

    newStudent->next = *head;
    *head = newStudent;
}

else
{
    STUDENT *current = *head;
    while (current->next != NULL && compareStudents(newStudent, current->next) >= 0)
    {
        current = current->next;
    }
    newStudent->next = current->next;
    current->next = newStudent;
}
}

int main()
{
    STUDENT *head = NULL;

    int n;

    printf("How many students : ");
    scanf("%d", &n);

    for (int i = 0; i < n; i++)
    {
        STUDENT *s = (STUDENT *)malloc(sizeof(STUDENT));

        printf("Enter Name of student--> %d: ", i + 1);
        scanf("%20s", s->name);

        printf("Enter Roll No of student--> %d: ", i + 1);
        scanf("%4s", s->roll);

        printf("Enter Marks obtained of student--> %d: ", i + 1);
        scanf("%d", &s->num);

        s->next = NULL;

        printf("\n\n");

        insertStudent(&head, s);
    }

    STUDENT *current = head;
    while (current != NULL)

```

```
{
    printf("Name: %s || Roll No: %s || Marks: %d\n",
current->name, current->roll, current->num);
    current = current->next;
}

while (head != NULL)
{
    STUDENT *temp = head;
    head = head->next;
    free(temp);
}

return 0;
}
```