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;

}