A Micro Project Report

on

Problem Solving using C Language

Submitted by

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

NARASARAOPETA ENGINEERING COLLEGE: NARASARAOPET

(AUTONOMOUS)

Accredited by NAAC with A+ Grade and NBA under Tier-1

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NARASARAOPETA ENGINEERING COLLEGE: NARASARAOPET

(AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that RAVIPATI PRASANTH KUMAR , Roll No: 23471A05CR, a Second Year Student of the Department of Computer Science and Engineering, has completed the Micro Project Satisfactorily in "Problem Solving using C Language" for the Academic Year 2024-2025

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AIM:-

1. Read Records of n Students & Display Details of Student Having Highest Marks

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

struct Student {
    char name[50];
    int roll_no;
    float marks;
};
int main() {
    int n, i;
    float highestMarks = -1;
    int indexOfHighest = -1;
    printf("Enter number of students: ");
    scanf("%d", &n);
    struct Student students[n];
    for (i = 0; i < n; i++) {
```

```
        printf("\nEnter details for student %d:\n", i + 1);
        printf("Name: ");
        scanf(" %[^\n]%*c", students[i].name);
        printf("Roll Number: ");
        scanf("%d", &students[i].roll_no);
        printf("Marks: ");
        scanf("%f", &students[i].marks);
        if (students[i].marks > highestMarks) {
            highestMarks = students[i].marks;
            indexOfHighest = i;
        }
    }
    if (indexOfHighest != -1) {
        printf("\nStudent with highest marks:\n");
        printf("Name: %s\n", students[indexOfHighest].name);
        printf("Roll Number: %d\n",
students[indexOfHighest].roll_no);
        printf("Marks: %.2f\n", students[indexOfHighest].marks);
    } else {
        printf("No student records found.\n");
    }
    return 0;
```

}

Output :

enter number of students: 2

Enter details for student 1:

Name: prasanth

Roll Number: 55

Marks: 99

Enter details for student 2:

Name: harsh

Roll Number: 33

Marks: 100

Student with highest marks:

Name: harsh

Roll Number: 33

Marks: 100.00

Records of n Different Students in Structure & Sort on the Basis of Marks in Ascending Order

AIM :

Read Records of n Different Students in Structure & Sort on the Basis of Marks in Ascending Order

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

struct Student {
   char name[50];
   int roll_no;
   float marks;
};
void sortStudents(struct Student students[], int n) {
   struct Student temp;
   for (int i = 0; i < n - 1; i++) {
      for (int j = 0; j < n - i - 1; j++) {
         if (students[j].marks > students[j + 1].marks) {
            temp = students[j];
            students[j] = students[j + 1];
            students[j + 1] = temp;
         }
      }
   }
```

```
}
int main() {
    int n;
    printf("Enter number of students: ");
    scanf("%d", &n);
    struct Student students[n];
    for (int i = 0; i < n; i++) {
        printf("\nEnter details for student %d:\n", i + 1);
        printf("Name: ");
        scanf(" %[^\n]%*c", students[i].name);
        printf("Roll Number: ");
        scanf("%d", &students[i].roll_no);
        printf("Marks: ");
        scanf("%f", &students[i].marks);
    }
    sortStudents(students, n);
    printf("\nSorted Student Records (by Marks in Ascending Order):\n");
    for (int i = 0; i < n; i++) {
        printf("\nStudent %d:\n", i + 1);
        printf("Name: %s\n", students[i].name);
        printf("Roll Number: %d\n", students[i].roll_no);
        printf("Marks: %.2f\n", students[i].marks);
    }

    return 0;
}
```

Output :

```
Enter number of students: 2
Enter details for student 1:
Name: prasanth
```

Roll Number: 55

Marks: 99

Enter details for student 2:

Name: harsh

Roll Number: 33

Marks: 100

Sorted Student Records (by Marks in Ascending Order):

Student 1:

Name: prasanth

Roll Number: 55

Marks: 99.0

Student 2:

Name: harsh

Roll Number: 33

Marks: 100.00

Employee Record in Descending Order by Age in Structure

AIM :

Enter Employee Record in Descending Order by Age in Structure

```
#include <stdio.h>
#include <string.h>
struct Employee {
    char name[50];
    int id;
    int age;
};
void swap(struct Employee *a, struct Employee *b) {
    struct Employee temp = *a;
    *a = *b;
    *b = temp;
}
void sortEmployees(struct Employee employees[], int n) {
    for (int i = 0; i < n - 1; i++) {
```

```
        for (int j = 0; j < n - i - 1; j++) {
            if (employees[j].age < employees[j + 1].age) {
                swap(&employees[j], &employees[j + 1]);
            }
        }
    }
}
int main() {
    int n;
    printf("Enter the number of employees: ");
    scanf("%d", &n);
    struct Employee employees[n];
    for (int i = 0; i < n; i++) {
        printf("\nEnter details for employee %d:\n", i + 1);
        printf("Name: ");
        scanf(" %[^\n]%*c", employees[i].name);
        printf("ID: ");
        scanf("%d", &employees[i].id);
        printf("Age: ");
        scanf("%d", &employees[i].age);
    }
    sortEmployees(employees, n);
    printf("\nEmployee records sorted by age in descending order:\n");
    for (int i = 0; i < n; i++) {
        printf("\nEmployee %d\n", i + 1);
        printf("Name: %s\n", employees[i].name);
        printf("ID: %d\n", employees[i].id);
        printf("Age: %d\n", employees[i].age);
    }
    return 0;
}
```

Output :

Enter the number of employees: 3

Enter details for employee 1:

Name: prasanth

ID: 55

Age: 18

Enter details for employee 2:

Name: sarath

ID: 4

Age: 19

Enter details for employee 3:

Name: venkatesh

ID: 28

Age: 19

Employee records sorted by age in descending order:

Employee 1

Name: sarath

ID: 4

Age: 19

Employee 2

Name: venkatesh

ID: 28

Age: 19

Employee 3

Name: prasanth

ID: 55

Age: 18

Grace marks for a student using switch.

AIM :

Write a program which to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in.

```
#include <stdio.h>

int main() {
    int failedSubjects, graceMarks = 0;
    char classObtained;
    printf("Enter the class obtained by the student (F for First Class, S for Second Class, T for
Third Class): ");
    scanf(" %c", &classObtained);
    classObtained = (classObtained >= 'a' && classObtained <= 'z') ? classObtained - 'a' + 'A' :
classObtained;

    printf("Enter the number of subjects the student has failed in: ");
    scanf("%d", &failedSubjects);
    if (failedSubjects < 0) {
        printf("Number of failed subjects cannot be negative.\n");
        return 0;
    switch(classObtained) {
        case 'F':
            if (failedSubjects > 3) {
                graceMarks = 0;
            } else if (failedSubjects <= 3) {
                graceMarks = 5 * failedSubjects;
            }
            break;

        case 'S':
            if (failedSubjects > 2) {
                graceMarks = 0;
            } else if (failedSubjects <= 2) {
                graceMarks = 4 * failedSubjects;
```

```
            }
            break;

        case 'T':
            if (failedSubjects > 1) {
                graceMarks = 0;
            } else if (failedSubjects == 1) {
                graceMarks = 5 * failedSubjects;
            }
            break;

        default:
            printf("Invalid class entered. Please enter 'F', 'S', or 'T'.\n");
            return 0;
    }

        printf("The student gets %d grace marks.\n", graceMarks);
    } else {
        printf("The student does not get any grace marks.\n");
    }

    return 0;
}
```

Output :

Enter the class obtained by the student (F for First Class, S for Second Class, T for Third Class): T

Enter the number of subjects the student has failed in: 3

The student does not get any grace marks.