**Assignment - 21 A Job Ready Bootcamp in C++, DSA and IOT MySirG**

**Structure**

1. Define a structure Employee with member variables id, name, salary.

#include <stdio.h>

struct Employee {

int id;

char name[50];

float salary;

};

int main() {

struct Employee emp1, emp2, emp3;

emp1.id = 1;

strcpy(emp1.name, "Rahul");

emp1.salary = 5000.0;

emp2.id = 2;

strcpy(emp2.name, "Priya");

emp2.salary = 6000.0;

emp3.id = 3;

strcpy(emp3.name, "Binod");

emp3.salary = 5500.0;

printf("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n");

printf("| ID | name | salary |\n");

printf("|-----|--------|---------|\n");

printf("| %d | %s |%.2f |\n", emp1.id, emp1.name, emp1.salary);

printf("| %d | %s |%.2f |\n", emp2.id, emp2.name, emp2.salary);

printf("| %d | %s |%.2f |\n", emp3.id, emp3.name, emp3.salary);

printf("|\_\_\_\_\_|\_\_\_\_\_\_\_\_|\_\_\_\_\_\_\_\_\_|\n");

return 0;

}

2. Write a function to take input employee data from the user. [ Refer structure from

question 1 ]

#include <stdio.h>

#include <string.h>

struct Employee {

int id;

char name[50];

float salary;

};

struct Employee input() {

struct Employee emp;

printf("Enter id, name, and salary of Employee:\n");

scanf("%d", &emp.id);

fflush(stdin);

fgets(emp.name, sizeof(emp.name), stdin);

emp.name[strlen(emp.name)-1] = '\0';

scanf("%f", &emp.salary);

return emp;

}

int main() {

struct Employee emp[3];

int i;

for (i = 0; i < 3; i++) {

emp[i] = input();

}

printf("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n");

printf("| ID | name | salary |\n");

printf("|-----|--------|---------|\n");

for (i = 0; i < 3; i++) {

printf("| %-4d| %-7s| %8.2f|\n", emp[i].id, emp[i].name, emp[i].salary);

}

printf("|\_\_\_\_\_|\_\_\_\_\_\_\_\_|\_\_\_\_\_\_\_\_\_|\n");

return 0;

}

3. Write a function to display employee data. [ Refer structure from question 1 ]

#include <stdio.h>

struct Marks {

int roll\_no;

char name[50];

int chem\_marks;

int maths\_marks;

int phy\_marks;

};

int main() {

struct Marks student[5];

int i;

for (i = 0; i < 5; i++) {

printf("Enter details of student %d:\n", i+1);

printf("Roll no.: ");

scanf("%d", &student[i].roll\_no);

printf("Name: ");

scanf("%s", student[i].name);

printf("Marks in Chemistry: ");

scanf("%d", &student[i].chem\_marks);

printf("Marks in Mathematics: ");

scanf("%d", &student[i].maths\_marks);

printf("Marks in Physics: ");

scanf("%d", &student[i].phy\_marks);

}

printf("\n\n");

printf("Roll No. Name Chemistry Mathematics Physics Percentage\n");

printf("-----------------------------------------------------------------------\n");

for (i = 0; i < 5; i++) {

float percentage = (student[i].chem\_marks + student[i].maths\_marks + student[i].phy\_marks) / 3.0;

printf("%-8d %-14s %-11d %-13d %-10d %.2f%%\n", student[i].roll\_no, student[i].name, student[i].chem\_marks, student[i].maths\_marks, student[i].phy\_marks, percentage);

}

return 0;

}

4. Write a function to find the highest salary employee from a given array of 10

employees. [ Refer structure from question 1]

#include <stdio.h>

struct Employee {

int id;

char name[50];

float salary;

};

struct Employee input() {

struct Employee emp;

printf("Enter id, name, and salary of Employee:\n");

scanf("%d", &emp.id);

fflush(stdin);

fgets(emp.name, sizeof(emp.name), stdin);

emp.name[strlen(emp.name)-1] = '\0';

scanf("%f", &emp.salary);

return emp;

}

struct Employee\* findHighestSalary(struct Employee empArr[], int size) {

struct Employee \*highest = &empArr[0];

for(int i=1; i<size; i++) {

if(empArr[i].salary > highest->salary) {

highest = &empArr[i];

}

}

return highest;

}

int main() {

struct Employee emp[3];

int i;

for (i = 0; i < 3; i++) {

emp[i] = input();

}

printf("\n\n");

printf(" ID name salary \n");

printf("--------------------------------\n");

for (i = 0; i < 3; i++) {

printf(" %d %s %.2f\n", emp[i].id, emp[i].name, emp[i].salary);

}

struct Employee \*highest = findHighestSalary(emp, 3);

printf("\n\n");

printf("Highest salary employee:\n");

printf("-----------------------------\n");

printf(" ID name salary \n");

printf(" %d %s %.2f\n", highest->id, highest->name, highest->salary);

return 0;

}

5. Write a function to sort employees according to their salaries [ refer structure from

question 1]

#include <stdio.h>

struct Student {

char name[50];

int roll\_no;

float marks;

};

int main() {

int n;

printf("Enter the number of students: ");

scanf("%d", &n);

struct Student students[n];

for (int i = 0; i < n; i++) {

printf("Enter the name of student %d: ", i + 1);

scanf("%s", students[i].name);

printf("Enter the roll no of student %d: ", i + 1);

scanf("%d", &students[i].roll\_no);

printf("Enter the marks of student %d: ", i + 1);

scanf("%f", &students[i].marks);

}

printf("\n\nStudent Information:\n");

printf("---------------------------------------\n");

printf("Roll No\t\tName\t\tMarks\n");

printf("---------------------------------------\n");

for (int i = 0; i < n; i++) {

printf("%d\t\t%s\t\t%.2f\n", students[i].roll\_no, students[i].name, students[i].marks);

}

return 0;

}

6. Write a function to sort employees according to their names [refer structure from

question 1]

#include <stdio.h>

#include <string.h>

struct Employee {

int id;

char name[50];

float salary;

};

struct Employee input() {

struct Employee emp;

printf("Enter id, name, and salary of Employee:\n");

scanf("%d", &emp.id);

fflush(stdin);

fgets(emp.name, sizeof(emp.name), stdin);

emp.name[strlen(emp.name)-1] = '\0';

scanf("%f", &emp.salary);

return emp;

}

void sortEmployeesByName(struct Employee empArr[], int size) {

for (int i = 0; i < size-1; i++) {

for (int j = i+1; j < size; j++) {

if (strcmp(empArr[i].name, empArr[j].name) > 0) {

struct Employee temp = empArr[i];

empArr[i] = empArr[j];

empArr[j] = temp;

}

}

}

}

int main() {

struct Employee emp[3];

int i;

for (i = 0; i < 3; i++) {

emp[i] = input();

}

sortEmployeesByName(emp, 3);

printf("\n\n");

printf(" ID name salary \n");

printf("--------------------------------\n");

for (i = 0; i < 3; i++) {

printf(" %d %s %.2f\n", emp[i].id, emp[i].name, emp[i].salary);

}

return 0;

}

7. Write a program to calculate the difference between two time periods.

#include <stdio.h>

struct Time {

int hours;

int minutes;

int seconds;

};

void inputTime(struct Time \*t) {

printf("Enter time (hh:mm:ss): ");

scanf("%d:%d:%d", &t->hours, &t->minutes, &t->seconds);

}

void printTime(struct Time t) {

printf("%02d:%02d:%02d", t.hours, t.minutes, t.seconds);

}

int timeToSeconds(struct Time t) {

return t.hours \* 3600 + t.minutes \* 60 + t.seconds;

}

struct Time secondsToTime(int seconds) {

struct Time t;

t.hours = seconds / 3600;

t.minutes = (seconds % 3600) / 60;

t.seconds = seconds % 60;

return t;

}

int main() {

struct Time t1, t2, diff;

int totalSeconds1, totalSeconds2, diffSeconds;

printf("Enter first time:\n");

inputTime(&t1);

printf("Enter second time:\n");

inputTime(&t2);

totalSeconds1 = timeToSeconds(t1);

totalSeconds2 = timeToSeconds(t2);

if (totalSeconds1 > totalSeconds2) {

diffSeconds = totalSeconds1 - totalSeconds2;

} else {

diffSeconds = totalSeconds2 - totalSeconds1;

}

diff = secondsToTime(diffSeconds);

printf("\nTime difference: ");

printTime(diff);

printf("\n");

return 0;

}

8. Write a program to store information of 10 students and display them using structure.

#include <stdio.h>

struct Student {

int id;

char name[50];

float gpa;

};

int main() {

struct Student students[10];

int i;

for (i = 0; i < 10; i++) {

printf("Enter information for student %d:\n", i+1);

printf("ID: ");

scanf("%d", &students[i].id);

printf("Name: ");

fflush(stdin);

fgets(students[i].name, sizeof(students[i].name), stdin);

students[i].name[strlen(students[i].name)-1] = '\0';

printf("GPA: ");

scanf("%f", &students[i].gpa);

}

printf("\n\n");

printf(" ID name GPA \n");

printf("------------------------------------\n");

for (i = 0; i < 10; i++) {

printf(" %d %-20s %.2f\n", students[i].id, students[i].name, students[i].gpa);

}

return 0;

}

9. Write a program to store information of n students and display them using structure.

#include <stdio.h>

struct Student {

char name[50];

int roll\_no;

float marks;

};

int main() {

int n;

printf("Enter the number of students: ");

scanf("%d", &n);

struct Student students[n];

for (int i = 0; i < n; i++) {

printf("Enter the name of student %d: ", i + 1);

scanf("%s", students[i].name);

printf("Enter the roll no of student %d: ", i + 1);

scanf("%d", &students[i].roll\_no);

printf("Enter the marks of student %d: ", i + 1);

scanf("%f", &students[i].marks);

}

printf("\n\nStudent Information:\n");

printf("---------------------------------------\n");

printf("Roll No\t\tName\t\tMarks\n");

printf("---------------------------------------\n");

for (int i = 0; i < n; i++) {

printf("%d\t\t%s\t\t%.2f\n", students[i].roll\_no, students[i].name, students[i].marks);

}

return 0;

}

10. Write a program to enter the marks of 5 students in Chemistry, Mathematics and

Physics (each out of 100) using a structure named Marks having elements roll no.,

name, chem\_marks, maths\_marks and phy\_marks and then display the percentage

of each student.

#include <stdio.h>

struct Marks {

int roll\_no;

char name[50];

int chem\_marks;

int maths\_marks;

int phy\_marks;

};

int main() {

struct Marks student[5];

int i;

for (i = 0; i < 5; i++) {

printf("Enter details of student %d:\n", i+1);

printf("Roll no.: ");

scanf("%d", &student[i].roll\_no);

printf("Name: ");

scanf("%s", student[i].name);

printf("Marks in Chemistry: ");

scanf("%d", &student[i].chem\_marks);

printf("Marks in Mathematics: ");

scanf("%d", &student[i].maths\_marks);

printf("Marks in Physics: ");

scanf("%d", &student[i].phy\_marks);

}

printf("\n\n");

printf("Roll No. Name Chemistry Mathematics Physics Percentage\n");

printf("-----------------------------------------------------------------------\n");

for (i = 0; i < 5; i++) {

float percentage = (student[i].chem\_marks + student[i].maths\_marks + student[i].phy\_marks) / 3.0;

printf("%-8d %-14s %-11d %-13d %-10d %.2f%%\n", student[i].roll\_no, student[i].name, student[i].chem\_marks, student[i].maths\_marks, student[i].phy\_marks, percentage);

}

return 0;

}