**Assignment-21 Solution: Name – OM PANT**

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

Ans-

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

#include<stdio.h>

// Structure Definition;

struct  Employee

{

    char name[25];

    int id;

    int salary;

};

int main(){

    return 0;

}

1. Write a function to take input employee data from the user. [ Refer structure from question 1 ]

Ans-

// 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

{

    char name[25];

    int id;

    int salary;

};

// Function to read employee data from user

void readData(struct Employee \*Emp){

    printf("Enter Employee name: ");

    fflush(stdin);

    fgets(Emp->name,25,stdin);

    Emp->name[strlen(Emp->name)-1] = '\0';

    printf("Enter Employee ID: ");

    scanf("%d",&Emp->id);

    printf("Enter Salary: ");

    scanf("%d",&Emp->salary);

}

int main(){

    struct Employee Emp;

    readData(&Emp);

    return 0;

}

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

Ans-

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

#include<stdio.h>

#include<string.h>

struct  Employee

{

    char name[25];

    int id;

    int salary;

};

void readData(struct Employee \*Emp){

    printf("Enter Employee name: ");

    fflush(stdin);

    fgets(Emp->name,25,stdin);

    Emp->name[strlen(Emp->name)-1] = '\0';

    printf("Enter Employee ID: ");

    scanf("%d",&Emp->id);

    printf("Enter Salary: ");

    scanf("%d",&Emp->salary);

}

void showData(struct Employee e){

    printf("\nEmployee Details: \n");

    printf("Employee Name: %s\n",e.name);

    printf("Employee ID: %d\n",e.id);

    printf("Employee Salary: %d\n",e.salary);

}

int main(){

    struct Employee Emp;

    readData(&Emp);

    showData(Emp);

    return 0;

}

1. Write a function to find the highest salary employee from a given array of 10 employees. [ Refer structure from question 1]

Ans-

// 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>

#include<string.h>

struct  Employee

{

    char name[25];

    int id;

    int salary;

};

void readData(struct Employee \*Emp){

    printf("Enter Employee name: ");

    fflush(stdin);

    fgets(Emp->name,25,stdin);

    Emp->name[strlen(Emp->name)-1] = '\0';

    printf("Enter Employee ID: ");

    scanf("%d",&Emp->id);

    printf("Enter Salary: ");

    scanf("%d",&Emp->salary);

}

void showData(struct Employee e){

    printf("Employee Name: %s\n",e.name);

    printf("Employee ID: %d\n",e.id);

    printf("Employee Salary: %d\n",e.salary);

}

int maxSalary(struct Employee e[], int size){

    int i,max=0;

    for(i=0;i<size;i++){

        if(e[i].salary > max){

            max = e[i].salary;

        }

    }

    return max;

}

int main(){

    struct Employee Emp[10];

    int i,maxsalary;

    for(i=0;i<10;i++){

        printf("Enter %d Employee Details\n",i+1);

        readData(&Emp[i]);

    }

    printf("\n\n");

    for(i=0;i<10;i++){

        printf("Employee %d Details\n",i+1);

        showData(Emp[i]);

    }

    maxsalary = maxSalary(Emp, 3);

    for(int j=0;j<10;j++){

        if(Emp[j].salary == maxsalary){

            printf("\n\tHighest Salaried Employee..\n");

            printf("Employee name: %s\n",Emp[j].name);

            printf("Employee ID: %d\n",Emp[j].id);

            printf("Employee Salary: %d\n",Emp[j].salary);

        }

    }

    return 0;

}

1. Write a function to sort employees according to their salaries [ refer structure from question 1]

Ans-

// 5. Write a function to sort employees according to their salaries [ refer structure from question 1]

#include<stdio.h>

#include<string.h>

struct  Employee

{

    char name[25];

    int id;

    int salary;

};

void readData(struct Employee \*Emp){

    printf("Enter Employee name: ");

    fflush(stdin);

    fgets(Emp->name,25,stdin);

    Emp->name[strlen(Emp->name)-1] = '\0';

    printf("Enter Employee ID: ");

    scanf("%d",&Emp->id);

    printf("Enter Salary: ");

    scanf("%d",&Emp->salary);

}

void showData(struct Employee e){

    printf("Employee Name: %s\n",e.name);

    printf("Employee ID: %d\n",e.id);

    printf("Employee Salary: %d\n",e.salary);

}

void sortEmployee(struct Employee e[],int size){

    int i,j;

    struct Employee temp;

    for(i = 0;i<size;i++){

        for(j=i;j<size;j++){

            if(e[i].salary>e[j].salary){

                //swapping code

                temp.id = e[i].id;

                strcpy(temp.name,e[i].name);

                temp.salary = e[i].salary;

                e[i].id = e[j].id;

                strcpy(e[i].name,e[j].name);

                e[i].salary = e[j].salary;

                e[j].id = temp.id;

                strcpy(e[j].name,temp.name);

                e[j].salary = temp.salary;

            }

        }

    }

}

int main(){

    struct Employee Emp[5];

    int i;

    for(i=0;i<5;i++){

        printf("Enter %d Employee Details\n",i+1);

        readData(&Emp[i]);

    }

    printf("\n\n");

    for(i=0;i<5;i++){

        printf("Employee %d Details\n",i+1);

        showData(Emp[i]);

    }

    //function to sort employees according to salary

    sortEmployee(Emp,5);

    // printing employees after sorting

    for(int j=0;j<5;j++){

        printf("\nEmployee name: %s\n",Emp[j].name);

        printf("Employee ID: %d\n",Emp[j].id);

        printf("Employee Salary: %d\n",Emp[j].salary);

    }

    return 0;

}

1. Write a function to sort employees according to their names [refer structure from question 1]

Ans-

// 6. Write a function to sort employees according to their names [refer structure from question 1]

#include<stdio.h>

#include<string.h>

struct  Employee

{

    char name[25];

    int id;

    int salary;

};

void readData(struct Employee \*Emp){

    printf("Enter Employee name: ");

    fflush(stdin);

    fgets(Emp->name,25,stdin);

    Emp->name[strlen(Emp->name)-1] = '\0';

    printf("Enter Employee ID: ");

    scanf("%d",&Emp->id);

    printf("Enter Salary: ");

    scanf("%d",&Emp->salary);

}

void showData(struct Employee e){

    printf("\tEmployee Name: %s\n",e.name);

    printf("\tEmployee ID: %d\n",e.id);

    printf("\tEmployee Salary: %d\n",e.salary);

}

void sortEmployeeByName(struct Employee e[],int size){

    int i,j;

    struct Employee temp;

    for(i = 0;i<size;i++){

        for(j=i;j<size;j++){

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

                //swapping code

                temp.id = e[i].id;

                strcpy(temp.name,e[i].name);

                temp.salary = e[i].salary;

                e[i].id = e[j].id;

                strcpy(e[i].name,e[j].name);

                e[i].salary = e[j].salary;

                e[j].id = temp.id;

                strcpy(e[j].name,temp.name);

                e[j].salary = temp.salary;

            }

        }

    }

}

int main(){

    struct Employee Emp[5];

    int i;

    for(i=0;i<5;i++){

        printf("Enter %d Employee Details\n",i+1);

        readData(&Emp[i]);

    }

    printf("\n\n");

    for(i=0;i<5;i++){

        printf("\nEmployee %d Details\n",i+1);

        showData(Emp[i]);

    }

    //function to sort employees according to names

    sortEmployeeByName(Emp,5);

    // printing employees after sorting

    printf("\tSorted By Names:\n");

    for(int j=0;j<5;j++){

        printf("\nEmployee name: %s\n",Emp[j].name);

        printf("Employee ID: %d\n",Emp[j].id);

        printf("Employee Salary: %d\n",Emp[j].salary);

    }

    return 0;

}

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

Ans-

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

#include<stdio.h>

#include<string.h>

struct Time{

    int hour;

    int minute;

};

int main(){

    struct Time start\_time, end\_time, difference;

    printf("Enter Start Time(HH:MM) in 24hr Format : ");

    scanf("%d %d",&start\_time.hour,&start\_time.minute);

    printf("Enter End Time(HH:MM) in 24hr Format : ");

    scanf("%d %d",&end\_time.hour,&end\_time.minute);

    printf("Start time\n");

    printf("%d %d \n",start\_time.hour,start\_time.minute);

    printf("end time\n");

    printf("%d %d\n",end\_time.hour,end\_time.minute);

    if(start\_time.minute<end\_time.minute){

        start\_time.minute +=60;

        start\_time.hour -= 1;

        difference.hour = start\_time.hour - end\_time.hour;

        difference.minute = start\_time.minute - end\_time.minute;

    }

    else if(start\_time.hour<end\_time.hour){

        difference.hour = end\_time.hour - start\_time.hour;

        difference.minute = start\_time.minute - end\_time.minute;

    }

    else {

        difference.hour = start\_time.hour - end\_time.hour;

        difference.minute = start\_time.minute - end\_time.minute;

    }

    printf("Time Difference is: %d:%d ( %d hr and %d minutes ) \n",difference.hour,difference.minute,difference.hour,difference.minute);

    return 0;

}

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

Ans-

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

#include<stdio.h>

#include<string.h>

struct Student{

    char name[25];

    int rollno;

    int age;

};

void readDetails(struct Student \*std){

    printf("Enter Student Name: ");

    fflush(stdin);

    fgets(std->name,25,stdin);

    std->name[strlen(std->name) -1] = '\0';

    printf("Enter Roll No: ");

    scanf("%d",&std->rollno);

    printf("Enter Age: ");

    scanf("%d",&std->age);

}

void showDetails(struct Student std[], int size){

    for(int i=0;i<size;i++){

        printf("%d Student\n",i+1);

        printf("\tName: %s",std[i].name);

        printf("\n\tRoll No: %d",std[i].rollno);

        printf("\n\tAge: %d\n",std[i].age);

    }

}

int main(){

    struct Student std[10];

    int i;

    //taking student details from user

    for(i=0;i<10;i++){

        printf("\tEnter %d Student Details\n",i+1);

        readDetails(&std[i]);

        printf("\n");

    }

    //displaying detailsof students

    printf("\n\tStudents are:\n");

    showDetails(std,10);

    return 0;

}

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

Ans-

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

#include<stdio.h>

#include<string.h>

#include<stdlib.h>

struct Student{

    char name[25];

    int rollno;

    int age;

};

void readDetails(struct Student \*std){

    printf("Enter Student Name: ");

    fflush(stdin);

    fgets(std->name,25,stdin);

    std->name[strlen(std->name) -1] = '\0';

    printf("Enter Roll No: ");

    scanf("%d",&std->rollno);

    printf("Enter Age: ");

    scanf("%d",&std->age);

}

void showDetails(struct Student std[], int size){

    for(int i=0;i<size;i++){

        printf("%d Student\n",i+1);

        printf("\tName: %s",std[i].name);

        printf("\n\tRoll No: %d",std[i].rollno);

        printf("\n\tAge: %d\n",std[i].age);

    }

}

int main(){

    int n;

    struct Student \*std;

    printf("Enter No of students\n");

    scanf("%d",&n);

    std = (struct Student \*)malloc(n\*sizeof(struct Student));

    int i;

    //taking student details from user

    for(i=0;i<n;i++){

        printf("\tEnter %d Student Details\n",i+1);

        readDetails(&std[i]);

        printf("\n");

    }

    //displaying detailsof students

    printf("\n\tStudents are:\n");

    showDetails(std,n);

    free(std);

    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.

Ans-

// 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>

#include<string.h>

#include<stdlib.h>

struct student

{

    int rollno;

    char name[25];

    int chem\_marks;

    int phy\_marks;

    int maths\_marks;

};

void readDetails(struct student \*s){

   printf("Enter Student Name: ");

   fflush(stdin);

   fgets(s->name,25,stdin);

   s->name[strlen(s->name)-1] = '\0';

   printf("Enter Roll No: ");

   scanf("%d",&s->rollno);

   printf("Enter Chemistry Marks: ");

   scanf("%d",&s->chem\_marks);

   printf("Enter Physics Marks: ");

   scanf("%d",&s->phy\_marks);

   printf("Enter Maths Marks: ");

   scanf("%d",&s->maths\_marks);

}

int main(){

    struct student std[5];

    int i,sum=0;

    float percentage;

    //taking student details from user

    for(i=0;i<5;i++){

        printf("\tEnter %d Student Details\n",i+1);

        readDetails(&std[i]);

        printf("\n");

    }

    for(i=0;i<5;i++){

        sum = std[i].chem\_marks + std[i].maths\_marks + std[i].phy\_marks;

        percentage = (sum \* 100) / 300;

        printf("Name: %s   Percentage: %.2f%%\n",std[i].name,percentage);

        sum = 0;

    }

 return 0;

}