ASSIGNMENT 3

***QUESTION 1***

**CODE**

#include<stdio.h>

#define size 10

void sub\_matrix\_2(int sub\_matrix[][size],int n,int max[][size],char id[10]);

void sub\_matrix\_4(int sub\_matrix[][size],int n,int max[][size],char id[10]);

void sub\_matrix\_8(int sub\_matrix[][size],int n,int max[][size],char id[10]);

void fill\_data(int matrix[][size],int n,char id[10]);

int main(){

printf("23k-0800\_Muhammad\_Mufeez\n\n\n");

int i,j,k,l;

int max[size][size];

int max\_local[size][size];

printf("\nEnter id in form of \*\*\*-\*\*\*\*: ");

char id[10];

fflush(stdin);

gets(id);

//for 2x2 matrix

sub\_matrix\_2(max\_local,2,max,id);

//for 4x4 matrix

sub\_matrix\_4(max\_local,4,max,id);

//for 8x8 matrix

sub\_matrix\_8(max\_local,8,max,id);

return 0;

}

void fill\_data(int matrix[][size],int n,char id[10]){

int arr[4],i,j,k;

for(i=4 ,j=0;i<8,j<4;i++,j++){

arr[j]= id[i] -'0';

}

printf("\n\n");

for(i=0,k=0;i<n;i++){

for(j=0;j<n;j++,k++){

if(k==4)

k=0;

matrix[i][j]=arr[k];

}

}

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

for(j=0;j<n;j++){

printf("%d ",matrix[i][j]);

}

printf("\n");

}

}

void sub\_matrix\_2(int sub\_matrix[][size],int n,int max[][size],char id[10]){

int sm\_size = n/2;

int x=0,y=0,i,j,max\_val=0,k,l;

fill\_data(max,n,id);

for(i=0, x=0;i<=sm\_size+2;i+=2,x++){

for(j=0,y=0;j<=sm\_size+2;j+=2,y++){

max\_val=0;

for(k=i;k<i+2;k++){

for(l=j;l<j+2;l++){

if(max[k][l]>max\_val){

max\_val= max[k][l];

}

}

}

sub\_matrix[x][y] = max\_val;

}

}

printf("\n\n\tFor 2x2: \n");

for(i=0;i<sm\_size;i++){

for(j=0;j<sm\_size;j++){

printf("%d ",sub\_matrix[i][j]);}

printf("\n");

}

}

void sub\_matrix\_4(int sub\_matrix[][size],int n,int max[][size],char id[10]){

int sm\_size = n/2;

int x=0,y=0,i,j,max\_val=0,k,l;

fill\_data(max,n,id);

for(i=0, x=0;i<=sm\_size+2;i+=2,x++){

for(j=0,y=0;j<=sm\_size+2;j+=2,y++){

max\_val=0;

for(k=i;k<i+2;k++){

for(l=j;l<j+2;l++){

if(max[k][l]>max\_val){

max\_val= max[k][l];

}

}

}

sub\_matrix[x][y] = max\_val;

}

}

printf("\n\n\tFor 4x4: \n");

for(i=0;i<sm\_size;i++){

for(j=0;j<sm\_size;j++){

printf("%d ",sub\_matrix[i][j]);}

printf("\n");

}

}

void sub\_matrix\_8(int sub\_matrix[][size],int n,int max[][size],char id[10]){

int sm\_size = n/2;

int x=0,y=0,i,j,max\_val=0,k,l;

fill\_data(max,n,id);

for(i=0, x=0;i<=sm\_size+2;i+=2,x++){

for(j=0,y=0;j<=sm\_size+2;j+=2,y++){

max\_val=0;

for(k=i;k<i+2;k++){

for(l=j;l<j+2;l++){

if(max[k][l]>max\_val){

max\_val= max[k][l];

}

}

}

sub\_matrix[x][y] = max\_val;

}

}

printf("\n\n\tFor 8x8: \n");

for(i=0;i<sm\_size;i++){

for(j=0;j<sm\_size;j++){

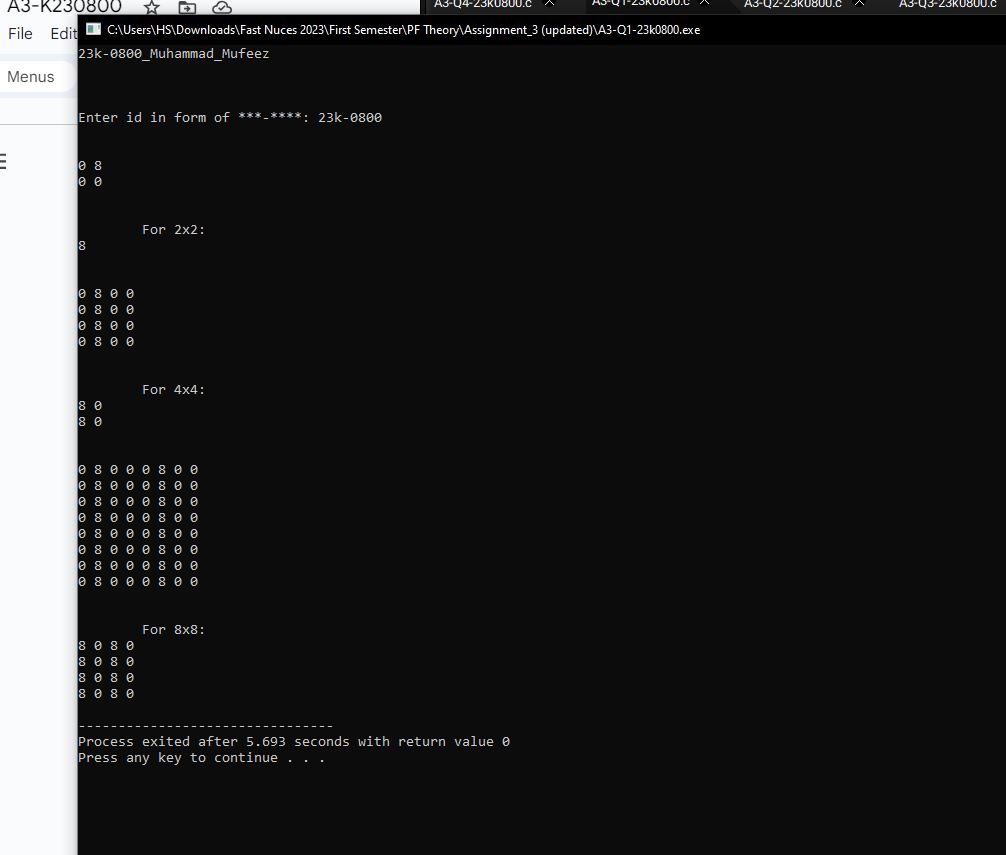
printf("%d ",sub\_matrix[i][j]);}

printf("\n");

}

}

**OUTPUT**



***QUESTION 2***

**CODE**

#include<stdio.h>

#include<string.h>

#include<stdlib.h>

#include<time.h>

typedef struct {

char name[50];

char role[10];

int communication;

int teamwork;

int creativity;

} employee;

typedef struct {

employee emp[5];

} dep;

int main(){

printf("23k-0800\_Muhammad\_Mufeez\n\n\n");

dep arr[4];

char names[20][50]={"Ahmed","Ali","uzair","mufeez","muzammil","someone","junaid","hanif","aliahmed","aqib","harron","alian","huzaifa","hamza","mazil","adil","basit","maaz","khizr","umair"};

char o\_roles[5][30]={"Director","Executive","Manager","Employee","Trainee"};

char dept[4][20] = {"HR","Finance","Marketing","Logistic"};

char roles[5][30];

int n,i=0,k,pos=0,j,index=0,max=0,total,dep\_ind;

while(i<4){

j=0;

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

strcpy(roles[k],o\_roles[k]);

}

while(j<5){

srand(n+time(NULL));

n++;

index =rand()%20;

pos = rand()%5;

if((strcmp(names[index],"o"))!=0 && strcmp(roles[pos],"o")!=0){

strcpy(arr[i].emp[j].name,names[index]);

strcpy(arr[i].emp[j].role,roles[pos]);

strcpy(names[index],"o");

strcpy(roles[pos],"o");

index++;

arr[i].emp[j].communication=1+rand()%100;

arr[i].emp[j].creativity=1+rand()%100;

arr[i].emp[j].teamwork=1+rand()%100;

j++;

}

}

i++;

}

for(i=0;i<4;i++){

total =0;

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

total = total + arr[i].emp[j].communication + arr[i].emp[j].creativity + arr[i].emp[j].teamwork;

}

if(total > max){

max = total;

dep\_ind = i;

}

printf("\nScore of %s department: %d",dept[i],total);

}

printf("\n\nBest Department is %s with score: %d\nFurther details are given:\n\n",dept[dep\_ind],max);

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

printf("%s\t\t%s\t\t%d\t\t%d\t\t%d\n",arr[dep\_ind].emp[j].name,arr[dep\_ind].emp[j].role,arr[dep\_ind].emp[j].communication,arr[dep\_ind].emp[j].creativity,arr[dep\_ind].emp[j].teamwork);

}

//not required but additional, to show the whole data

// for(i=0;i<4;i++){

// printf("\n\nFor department %d\n",i+1);

// for(j=0;j<5;j++){

// printf("%s\t\t%s\t\t%d\t\t%d\t\t%d\n",arr[i].emp[j].name,arr[i].emp[j].role,arr[i].emp[j].communication,arr[i].emp[j].creativity,arr[i].emp[j].teamwork);

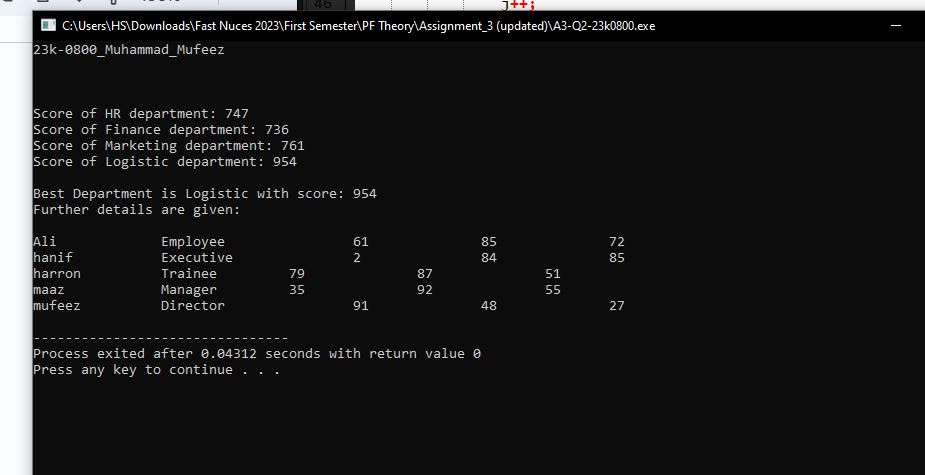
// }

// }

return 0;

}

**OUTPUT**

****

***QUESTION 3***

**CODE**

#include<stdio.h>

#include<string.h>

#include<stdlib.h>

typedef struct personal{

int id;

char name[30];

} pe;

typedef struct department{

int id;

int salary;

} de;

typedef struct combine{

int id;

char name[30];

int salary;

} cm;

void input(int n){

FILE \*personal = fopen("23k\_0800\_personal.txt","w+");

FILE \*department = fopen("23k\_0800\_department.txt","w+");

int id,salary,i;

char name[30];

if(department==NULL || personal==NULL){

printf("One or both files didn't open");

exit(1);

}

printf("\n\nEnter for personal file: ");

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

printf("\nfor user %d:\n",i+1);

printf("\n\tEnter Id: ");

fflush(stdin);

scanf("%d",&id);

printf("\n\tEnter Name: ");

fflush(stdin);

gets(name);

fprintf(personal,"%d %s\n",id,name);

}

printf("\n\nEnter for department file: ");

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

printf("\nfor user %d:\n",i+1);

printf("\n\tEnter Id: ");

scanf("%d",&id);

printf("\n\tEnter Salary: ");

scanf("%d",&salary);

fprintf(department,"%d %d\n",id,salary);

}

rewind(personal);

rewind(department);

sort(n,personal,department);

}

void sort(int n, FILE \*personal,FILE \*department){

pe tmp\_pe[n],per\_tmp;

de tmp\_de[n],dep\_tmp;

int i,j;

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

fscanf(personal,"%d",&tmp\_pe[i].id);

fgets(tmp\_pe[i].name,50,personal);

fscanf(department,"%d",&tmp\_de[i].id);

fscanf(department,"%d",&tmp\_de[i].salary);

}

for(j=0;j<n-1;j++){

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

if(tmp\_pe[i].id>tmp\_pe[i+1].id){

per\_tmp = tmp\_pe[i];

tmp\_pe[i]=tmp\_pe[i+1];

tmp\_pe[i+1] = per\_tmp;

}

if(tmp\_de[i].id>tmp\_de[i+1].id){

dep\_tmp = tmp\_de[i];

tmp\_de[i]=tmp\_de[i+1];

tmp\_de[i+1] = dep\_tmp;

}

}

}

rewind(personal);

rewind(department);

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

fprintf(personal,"%d %s",tmp\_pe[i].id,tmp\_pe[i].name);

fprintf(department,"%d %d\n",tmp\_de[i].id,tmp\_de[i].salary);

}

fclose(personal);

fclose(department);

}

void combine(int n){

int i,j;

struct combine arr[n];

FILE \*personal = fopen("23k\_0800\_personal.txt","r");

FILE \*department = fopen("23k\_0800\_department.txt","r");

FILE \*combine = fopen("23k\_0800\_combine.txt","w");

if(department==NULL || personal==NULL || combine ==NULL){

printf("One or both files didn't open");

exit(1);

}

pe tmp\_pe[n];

de tmp\_de[n];

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

fscanf(personal,"%d",&tmp\_pe[i].id);

fgets(tmp\_pe[i].name,50,personal);

fscanf(department,"%d",&tmp\_de[i].id);

fscanf(department,"%d",&tmp\_de[i].salary);

arr[i].id = tmp\_pe[i].id;

strcpy(arr[i].name,tmp\_pe[i].name);

arr[i].salary = tmp\_de[i].salary;

}

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

arr[i].name[strcspn(arr[i].name, "\n")] = '\0';

fprintf(combine,"%d %s %d\n",arr[i].id,arr[i].name,arr[i].salary);

}

printf("\n\ncombined file is given below: \n");

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

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

}

fclose(personal);

fclose(department);

fclose(combine);

}

int main(){

printf("23k-0800\_Muhammad\_Mufeez\n\n\n");

int n,id;

printf("Enter number of employees: ");

scanf("%d",&n);

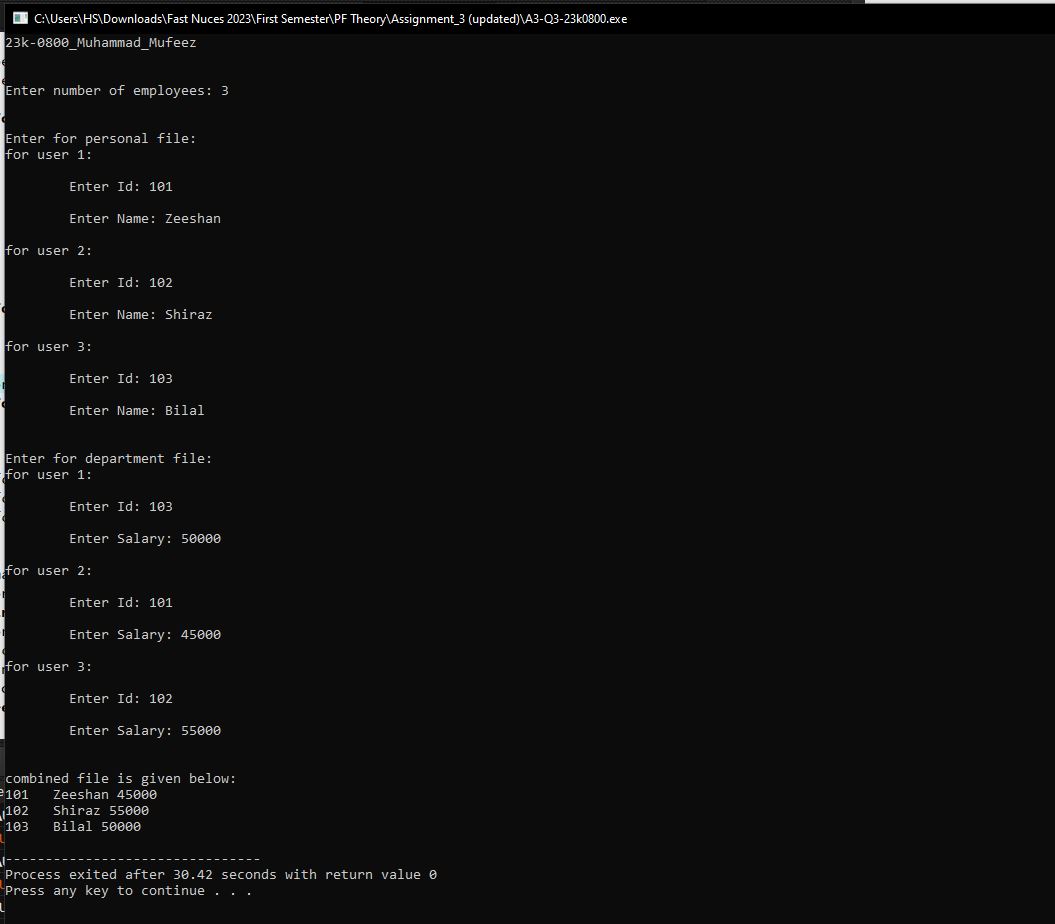
input(n);

combine(n);

return 0;

}

**OUTPUT**

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***QUESTION 4***

**CODE**

#include<stdio.h>

#include<string.h>

#include<stdlib.h>

#include<time.h>

typedef struct {

int w\_id;

char f\_name[50];

char l\_name[10];

int salary;

char date[25];

char dept[15];

} work;

typedef struct {

int w\_id;

char date[25];

int bonus;

} bonus;

typedef struct {

int w\_id;

char dept[15];

char date[25];

} title;

int main(){

printf("23k-0800\_Muhammad\_Mufeez\n\n\n");

int i,hr\_high=0,admin\_high=0,acc\_high=0,hr\_ind,admin\_ind,acc\_ind,total\_hr=0,total\_admin=0,total\_account=0;

work work\_data[8];

bonus bonus\_data[5];

title title\_data[8];

FILE \*fptr = fopen("23k\_0800\_q4.txt","r");

if(fptr==NULL){

printf("File didn't open");

exit(1);

}

for(i=0;i<8;i++){

fscanf(fptr,"%d %s %s %d %s %s",&work\_data[i].w\_id,work\_data[i].f\_name,work\_data[i].l\_name,&work\_data[i].salary,work\_data[i].date,work\_data[i].dept);

}

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

fscanf(fptr,"%d %s %d",&bonus\_data[i].w\_id,bonus\_data[i].date,&bonus\_data[i].bonus);

}

for(i=0;i<8;i++){

fscanf(fptr,"%d %s %s",&title\_data[i].w\_id,title\_data[i].dept,title\_data[i].date);

}

fclose(fptr);

for(i=0;i<8;i++){

if(strcmp(work\_data[i].dept,"HR")==0){

if(work\_data[i].salary>hr\_high){

hr\_high = work\_data[i].salary;

hr\_ind = i;

total\_hr += work\_data[i].salary;

}else

total\_hr += work\_data[i].salary;

}

if(strcmp(work\_data[i].dept,"Admin")==0){

if(work\_data[i].salary>admin\_high){

admin\_high = work\_data[i].salary;

admin\_ind = i;

total\_admin += work\_data[i].salary;

}else

total\_admin += work\_data[i].salary;

}

if(strcmp(work\_data[i].dept,"Account")==0){

if(work\_data[i].salary>acc\_high){

acc\_high = work\_data[i].salary;

acc\_ind = i;

total\_account += work\_data[i].salary;

}else

total\_account += work\_data[i].salary;

}

}

printf("\n\n\tREQUIRED OUTPUTS ARE GIVEN: ");

printf("\n\t%d\t%s\t%s\t%d\t%s\t%s\n",work\_data[hr\_ind].w\_id,work\_data[hr\_ind].f\_name,work\_data[hr\_ind].l\_name,hr\_high,work\_data[hr\_ind].date,work\_data[hr\_ind].dept);

printf("\t%d\t%s\t%s\t%d\t%s\t%s\n",work\_data[admin\_ind].w\_id,work\_data[admin\_ind].f\_name,work\_data[admin\_ind].l\_name,admin\_high,work\_data[admin\_ind].date,work\_data[admin\_ind].dept);

printf("\t%d\t%s\t%s\t%d\t%s\t%s\n",work\_data[acc\_ind].w\_id,work\_data[acc\_ind].f\_name,work\_data[acc\_ind].l\_name,acc\_high,work\_data[acc\_ind].date,work\_data[acc\_ind].dept);

printf("\n\tHR - %d",total\_hr);

printf("\n\tAdmin - %d",total\_admin);

printf("\n\tAccount - %d",total\_account);

// to see the fetched data from file, kindly uncomment the code below

// printf("\n\nExtraneous to show the data of files: \n\n");

// for(i=0;i<8;i++){

// printf("%d\t%s\t%s\t%d\t%s\t%s\n",work\_data[i].w\_id,work\_data[i].f\_name,work\_data[i].l\_name,work\_data[i].salary,work\_data[i].date,work\_data[i].dept);

// }

// printf("\n\n");

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

// printf("%d\t%s\t%d\n",bonus\_data[i].w\_id,bonus\_data[i].date,bonus\_data[i].bonus);

// }

// printf("\n\n");

// for(i=0;i<8;i++){

// printf("%d\t%s\t%s\n",title\_data[i].w\_id,title\_data[i].dept,title\_data[i].date);

// }

return 0;

}

**OUTPUT**

