/\*Problem 1: Defines a structure to model points in 2-dimensional space. Then takes coordinates of TWO points as user input and finds distance between them. \*/

#include <math.h>

struct point {

double x;

double y;

};

main(){

struct point p1,p2;

double dx,dy,d;

p1.x = 5;

p1.y = 4;

printf("Enter first point:\n x: ");

scanf("%lf",&p1.x);

printf("y: ");

scanf("%lf",&p1.y);

printf("Enter second point:\n x: ");

scanf("%lf",&p2.x);

printf("y: ");

scanf("%lf",&p2.y);

dx = p1.x - p2.x;

dy = p1.y - p2.y;

d = sqrt(dx\*dx+dy\*dy);

printf("Distance: %lf",d);

}

/\* Problem 2: Defines a structure to model height of a person. Then takes two person’s height as input and finds height difference. \*/

struct height{

int f;

int i;

};

main(){

int d;

struct height p1,p2,r;

printf("Enter height of first person:\n Feet: ");

scanf("%d",&p1.f);

printf("Inch: ");

scanf("%d",&p1.i);

printf("Enter height of second person:\n Feet: ");

scanf("%d",&p2.f);

printf("Inch: ");

scanf("%d",&p2.i);

d = (p1.f - p2.f)\*12 + p1.i - p2.i;

r.f = d/12;

r.i = d%12;

printf("Height difference %d feet %d inch",r.f,r.i);

}

/\*Problem 3: Defines a structure to model Bank Account. Then takesname and balance of two person’s name as user input and finds the richer person. \*/

struct bankAccount{

char name[40];

double b;

};

main(){

struct bankAccount b1,b2;

printf("Enter name of first Person: ");

gets(b1.name);

printf("Enter balance: ");

scanf("%lf%\*c",&b1.b);

printf("Enter name of second Person: ");

gets(b2.name);

printf("Enter balance: ");

scanf("%lf",&b2.b);

if(b1.b > b2.b)

printf("%s is richer",b1.name);

else

printf("%s is richer",b2.name);

}

/\*Problem 4: Defines a structure to model a student of a university.. Then takes a student’s information as user input and finds his grade using a user defined function. \*/

struct student{

int id;

float m;

char g;

};

char findGrade(struct student p){

char g;

if(p.m >= 90) g = 'A';

else if (p.m >= 80) g = 'B';

else if (p.m >= 70) g = 'C';

else if (p.m >= 60) g = 'D';

else g = 'F';

return g;

}

main(){

struct student s;

printf("Enter ID: ");

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

printf("Enter Mark: ");

scanf("%f",&s.m);

s.g = findGrade(s);

printf("ID: %d Mark: %f Grade: %c",s.id,s.m,s.g);

}

/\*Problem 5: Defines a structure to model a student of a university. Then takes a n student’s information as user input and finds highest mark using a user defined function. \*/

struct student{

int id;

float m;

char g;

};

float findHighest(struct student p[],int n){

float h;

int i;

h = p[0].m;

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

if (h < p[i].m)

h = p[i].m;

}

return h;

}

main(){

int n,i;

float h;

printf("How Many students?");

scanf("%d",&n);

struct student s[n];

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

printf("Enter ID: ");

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

printf("Enter Mark: ");

scanf("%f",&s[i].m);

}

h = findHighest(s,n);

printf("Highest marks: %.2f",h);

}