



Academic year: 2023-2024

Level: 1st year “Computer Science & Mathematics”

Module: Algorithmic and Data Structures 2

TP n°1
Solution

Pedagogic objectives

- Handle custom types in C language, in terms of declaration and processing.

Exercise n°1 :

```
#include <stdio.h>
typedef struct Point {
float x,y;
} Point;
typedef struct Circle {
float xc;
float yc ;
float radius;
} Circle ;
typedef struct Rectangle {
float Log, Lag ;
} Rectangle;
main ( )
{
Point p1;
Circle c1;
Rectangle R1;
```

```

printf ("Enter the fields of point p1: \n");
scanf ( "%f%f",&p1.x,&p1.y) ;
printf (" Show the fields of point p1: [ %f , %f ]\n", p1.x, p1.y);
printf ( " \n") ;
printf (" Enter the fields of circle c1: \n");
scanf ( " %f %f %f",&c1.xc,&c1.yc,&c1.radius) ;
printf (" Show the fields of circle c1: [%f, %f, %f]\n", c1.xc,
c1.yc,c1.radius);
printf ( " \n") ;
printf (" Enter the fields of rectangle R1: \n");
scanf ( "%f%f",&R1.Log,&R1.Lag) ;
printf ("Show the fields of rectangle R1: [%f, %f]\n", R1.Log,
R1.Lag);
printf ( " \n") ;}

```

Exercise n°2:

```

#include <stdio.h>
#include <math.h>
typedef struct panel{
float width , length, thickness ;
int typeWood ; }panel ;
main ( ){
panel p;
float Vol;
printf ( "\n Enter panel width: ");
scanf ( "%f", &p.width );
printf ( "\n Enter panel length: ");
scanf ( "%f",&p.length );
printf ( "\n Enter panel thickness : ");
scanf ( "%f",&p.thickness );
printf ( "\n give the type of wood: ");
scanf ( "%d", &p.typeWood);
printf ( "\n panel width: %.2f", p.width );
printf ( "\n panel length: %.2f", p.length );
printf ( "\n panel thickness : %.2f", p.thickness );
printf ( "\n wood type: ");
switch( p.typeWood){

```

```

case 0: printf ("pin\n");
    break;
case 1: printf (" oak \n");
    break ;
case 2: printf (" beech \n");
    break ;
default : printf ("unknown\n");
    break ;}
Vol = ( p.width * p.length * p.thickness )/pow(10,9);
printf ( "\n panel volume is: %f", Vol);
}

```

Exercise n°3 :

```

#include <stdio.h>
#include <string.h>
typedef struct Date {
    int day, month, year ;
} Date;
typedef struct Address{
    int Number,PostalCode ;
    char Street[20], Commune[20], Wilaya[20];
} Address;
typedef struct NP{
char Lastname[ 20], Firstname [20];
} NP;
typedef struct Employee {
NP FirstName;
Date BirthDate;
Address Residence;
} Employee ;
main( ){
Employee E;
int ann ;
char w []="ALGER";
printf ( "\n Employee name : " ) ;
scanf ( "%s",&E.FirstName.Lastname);
printf ( "\n Employee first name : ");

```

```

scanf ( "%s", &E.FirstName.Firstname);
printf ( "\n Date of birth:\n");
printf ( "Day: ");
scanf ( "%d", &E.BirthDate.day);
printf ( "\n Month:");
scanf ( "%d", &E.BirthDate.month);
printf ( "\n Year : ");
scanf ( "%d", &E.BirthDate.year);
printf ( "\n Employee residence :\n" ) ;
printf ( " Number :");
scanf ( "%d", &E.Residence.Number);
printf ( "\n Street : ");
scanf ( "%s",&E.Residence.Street);
printf ( "\ nCommon : ");
scanf ( "%s", &E.Residence.Commune);
printf ( "\n Wilaya : ");
scanf ( "%s",&E.Residence.Wilaya );
printf ( "\ n PostalCode : ");
scanf ( "%d", &E.Residence.PostalCode );
printf ( "\n Give year : ");
scanf ( "%d", &ann );
if( E.BirthDate.year < ann ){
printf ( "\n employee was born before year %d \n", ann ); }
else {
printf ( "\n employee was born after year %d \n", ann );}
printf ( "Enter Wilaya \n");
scanf ( "%s",&w);
if( strcmp (E.Residence.Wilaya,w )==0){
printf ( "Yes\n");}
else {
printf ( "No\n");
}
}

```