# Homework 5

## Structures & Union & Enum

### Example 1 C Program to Store Information(name, roll and marks) of a Student Using Structure

In this program, a structure(student) is created which contains name, roll and marks as its data member. Then, a structure variable(s) is created. Then, data (name, roll and marks) is taken from user and stored in data members of structure variable s. Finally, the data entered by user is displayed.

```c
#include <stdio.h>
#include <stdalign.h>

struct Student{

	double marks;
	char name[37];
	int roll_number;

}s1;
int main()
{
	printf("Enter information of students:\n");
	printf("Enter name: ");
	fflush(stdout);
	gets(s1.name);

	printf("Enter roll number: ");
	fflush(stdout);
	scanf("%d",&s1.roll_number);


	printf("Enter marks: ");
	fflush(stdout);
	scanf("%lf",&s1.marks);


	printf("\nDisplaying Information\n");

	printf("name: %s\n",s1.name);
	printf("roll: %d\n",s1.roll_number);
	printf("marks: %0.2f\n",s1.marks);

    return 0;
}
```

```
Console  Problems  Executables  Memory  Disassembly <1>
<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abdallah Ghazy\Desktop\New fo
Enter information of students:
Enter name: abdallah ghazy
Enter roll number: 21
Enter marks: 334.5
Displaying Information
name: abdallah ghazy
roll: 21
marks: 334.50
```

## Example 2 C Program to Add Two Distances (in inch-feet) System Using Structures

```c
#include <stdio.h>

struct Distance {
	int feet;
	float inch;
} d1, d2, result;

int main() {

	printf("Enter 1st distance\n");
	printf("Enter feet: ");
	fflush(stdout);
	scanf("%d", &d1.feet);
	printf("Enter inch: ");
	fflush(stdout);
	scanf("%f", &d1.inch);

	printf("\nEnter 2nd distance\n");
	printf("Enter feet: ");
	fflush(stdout);
	scanf("%d", &d2.feet);
	printf("Enter inch: ");
	fflush(stdout);
	scanf("%f", &d2.inch);

	result.feet = d1.feet + d2.feet;
	result.inch = d1.inch + d2.inch;

	while (result.inch >= 12.0) {
		result.inch = result.inch - 12.0;
		++result.feet;
	}
	printf("\nSum of distances = %d\'-%.1f\"", result.feet, result.inch);
	return 0;
}
```

```
<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abdallah Ghazy\Desktop\New folder (2)\te
Enter 1st distance
Enter feet: 12
Enter inch: 3.45

Enter 2nd distance
Enter feet: 12
Enter inch: 9.2

Sum of distances = 25'-0.6"
```

## Example 3 C Program to Add Two Complex Numbers by Passing Structure to a Function

```c
#include <stdio.h>

struct ComplexNumbers {
	float real;
	float img;
};

struct ComplexNumbers SumComplexNumbers(struct ComplexNumbers c1, struct ComplexNumbers c2);

int main() {
	struct ComplexNumbers c1, c2, c_r;
	printf("For 1st complex number\n");
	printf("Enter real and imaginary respectively: ");
	fflush(stdout);
	scanf("%f + %f i", &c1.real, &c1.img);

	printf("For 2st complex number\n");
	printf("Enter real and imaginary respectively: ");
	fflush(stdout);
	scanf("%f + %f i", &c2.real, &c2.img);

	c_r = SumComplexNumbers(c1, c2);

	printf("\nSum Complex Numbers = %0.2f + %0.2f i", c_r.real,c_r.img);

	return 0;
}

struct ComplexNumbers SumComplexNumbers(struct ComplexNumbers c1,struct ComplexNumbers c2) {

	struct ComplexNumbers r;
	r.real = c1.real + c2.real;
	r.img = c1.img + c2.img;
	return r;
}
```

```
Console  Problems  Executables  Memory  Disassembly <1>
<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abdallah Ghazy\Desktop\New folder (2)\text\Debug\text
For 1st complex number
Enter real and imaginary respectively: 2.3+4.5i
For 2st complex number
Enter real and imaginary respectively: 3.4+5i

Sum Complex Numbers = 5.70 + 9.50 i
```

## Example 4 C Program to Store Information of Students Using Structure

In this program, a structure(student) is created which contains name, roll and marks as its data member. Then, an array of structure of 10 elements is created. Then, data(name, roll and marks) for 10 elements is asked to user and stored in array of structure. Finally, the data entered by user is displayed.

```c
#include <stdio.h>

struct Student {
    double marks;
    char name[37];
    int roll_number;
};

int main() {
    struct Student Students[3];

    printf("Enter information of students:\n");

    for(int i = 0 ; i < 3 ; i++) {
        printf("\nFor roll number %d\n", i);
        Students[i].roll_number = i+1;

        printf("Enter name: ");
        fflush(stdout);
        fgets(Students[i].name, sizeof(Students[i].name), stdin);
        Students[i].name[strcspn(Students[i].name, "\n")] = 0;

        printf("Enter marks: ");
        fflush(stdout);
        scanf("%lf", &Students[i].marks);
        getchar();
    }

    printf("\nDisplaying Information\n");
    for(int i = 0 ; i < 3 ; i++) {
        printf("Information for roll number %d : \n", Students[i].roll_number);
        printf("Name: %s\n", Students[i].name);
        printf("Marks: %.2f\n", Students[i].marks);
    }

    return 0;
}
```

```
<terminated> (exit value: 0) text.exe [C/C++ Application] C:\Users\Abd
Enter information of students:

For roll number 1
Enter name: a
Enter marks: 1

For roll number 2
Enter name: b
Enter marks: 2

For roll number 3
Enter name: d
Enter marks: 3

For roll number 4
Enter name: a
Enter marks: 4

For roll number 5
Enter name: l
Enter marks: 5

For roll number 6
Enter name: l
Enter marks: 6

For roll number 7
Enter name: a
Enter marks: 7

For roll number 8
Enter name: h
```

## Example 4 write the output of this program

```
#include <stdio.h>
union job {        //defining a union
  char name[32];
  float salary;
  int worker_no;
}u;
struct job1 {
  char name[32];
  float salary;
  int worker_no;
}s;
int main(){
  printf("size of union = %d",sizeof(u));
  printf("\nsize of structure = %d", sizeof(s));
  return 0;
}
```