1- The given program uses a struct named student to store information about students, including their name, cell number, and the number of videos they have watched.

يستخدم البرنامج المحدد struct تسمى الطالب لتخزين المعلومات حول الطلاب، بما في ذلك أسمائهم ورقم هواتفهم المحمولة وعدد مقاطع الفيديو التي شاهدوها.

Input

```
1)
Name: aly
Cell: 0123456789
Videos: 20
2)
Name: omar
Cell: 456789213
Videos: 36
3)
Name: ahmed
Cell: 012226547
Videos: 90
```

Output

```
1)
Name: aly
Cell: 0123456789
Videos: 20
2)
Name: omar
Cell: 456789213
Videos: 36
3)
Name: ahmed
Cell: 012226547
Videos: 90
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

struct student {
    char name[15], cell[20];
    int videos;
};

int main() {
    int i;
    struct student x[3]; // Increase array size to 3

    for (i = 0; i < 3; i++) {
        printf("%d)\n", i + 1);
        printf("Name: ");
        scanf("%s", x[i].name);
        printf("Cell: ");
        scanf("%s", x[i].cell);
        printf("Videos: ");
        scanf("%d", &x[i].videos);
    }

    for (i = 0; i < 3; i++) {
        printf("%d)\n", i + 1);
        printf("Name: %s\n", x[i].name);
        printf("Cell: %s\n", x[i].cell);
        printf("Videos: %d\n", x[i].videos);
    }

    return 0;
}
```

2- Create a program that uses a struct named Person to represent information about a person, including their name and age. Initialize an array of 3 Person structures with some data and print their details.

قم بإنشاء برنامج يستخدم struct تسمى "Person " لتمثيل معلومات حول شخص ما، بما في ذلك اسمه وعمره. تهيئة array من هياكل الأشخاص الثلاثة مع بعض البيانات وطباعة تفاصيلها.

Output

```
Person 1:
Name: Alice
Age: 25

Person 2:
Name: Bob
Age: 30

Person 3:
Name: Charlie
Age: 22
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Person
struct Person {
    char name[20];
    int age;
};

int main() {
    // Declare an array of struct Person
    struct Person people[3] = {
        {"Alice", 25},
        {"Bob", 30},
        {"Charlie", 22}
    };

    // Print details of each person
    for (int i = 0; i < 3; i++) {
        printf("Person %d:\n", i + 1);
        printf("Name: %s\n", people[i].name);
        printf("Age: %d\n", people[i].age);
        printf("\n");
    }

    return 0;
}
```

3- Create a program using a struct named Book to represent information about a book, including its title and number of pages. Initialize an array of 2 Book structures with some data and print their details.

قم بإنشاء برنامج باستخدام struct تسمى Book لتمثيل معلومات حول الكتاب، بما في ذلك عنوانه وعدد صفحاته. تهيئة array of 2 Book structures مع بعض البيانات وطباعة تفاصيلهما.

Output

```
Book 1:
Title: Introduction to C
Pages: 150

Book 2:
Title: Data Structures in C
Pages: 200
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Book
struct Book {
    char title[50];
    int pages;
};

int main() {
    // Declare an array of struct Book
    struct Book library[2] = {
        {"Introduction to C", 150},
        {"Data Structures in C", 200}
    };

    // Print details of each book
    for (int i = 0; i < 2; i++) {
        printf("Book %d:\n", i + 1);
        printf("Title: %s\n", library[i].title);
        printf("Pages: %d\n", library[i].pages);
        printf("\n");
    }

    return 0;
}
```

4- Create a program that uses a struct named Rectangle to represent information about a rectangle, including its length and width. Initialize an array of 2 Rectangle structures with some data and calculate and print the area of each rectangle.

قم بإنشاء برنامج يستخدم struct تسمى Rectangle لتمثيل معلومات حول المستطيل، بما في ذلك طوله وعرضه. قم بتهيئة array مكونة من هيكلين مستطيلين مع بعض البيانات وحساب وطباعة مساحة كل مستطيل.

Output

```
Rectangle 1:
Length: 5.00
Width: 3.00
Area: 15.00

Rectangle 2:
Length: 7.00
Width: 4.50
Area: 31.50
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Rectangle
struct Rectangle {
    float length;
    float width;
};

int main() {
    // Declare an array of struct Rectangle
    struct Rectangle rectangles[2] = {
        {5.0, 3.0},
        {7.0, 4.5}
    };

    // Calculate and print the area of each rectangle
    for (int i = 0; i < 2; i++) {
        float area = rectangles[i].length * rectangles[i].width;
        printf("Rectangle %d:\n", i + 1);
        printf("Length: %.2f\n", rectangles[i].length);
        printf("Width: %.2f\n", rectangles[i].width);
        printf("Area: %.2f\n", area);
        printf("\n");
    }

    return 0;
}
```

5- Create a program using a struct named Person to represent information about a person, including their name and age. Ask the user to input data for two persons, then print their details.

قم بإنشاء برنامج باستخدام struct تسمى "Person " لتمثيل معلومات حول شخص ما، بما في ذلك اسمه وعمره. اطلب من المستخدم إدخال بيانات لشخصين، ثم طباعة بياناتهما.

Input

```
Enter details for person 1:
Name: amr
Age: 18

Enter details for person 2:
Name: ali
Age: 14
```

Output

```
Details of person 1:
Name: amr
Age: 18

Details of person 2:
Name: ali
Age: 14
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Person
struct Person {
    char name[30];
    int age;
};

int main() {
    // Declare two variables of struct Person
    struct Person person1, person2;

    // Input data for the first person
    printf("Enter details for person 1:\n");
    printf("Name: ");
    scanf("%s", person1.name);
    printf("Age: ");
    scanf("%d", &person1.age);

    // Input data for the second person
    printf("\nEnter details for person 2:\n");
    printf("Name: ");
    scanf("%s", person2.name);
    printf("Age: ");
    scanf("%d", &person2.age);

    // Print details of both persons
    printf("\nDetails of person 1:\n");
    printf("Name: %s\n", person1.name);
    printf("Age: %d\n", person1.age);

    printf("\nDetails of person 2:\n");
    printf("Name: %s\n", person2.name);
    printf("Age: %d\n", person2.age);

    return 0;
}
```

6- Create a program that uses a struct named Book to represent information about a book, including its title and the number of pages. Ask the user to input data for three books, then print their details.

قم بإنشاء برنامج يستخدم struct تسمى Book لتمثيل معلومات حول الكتاب، بما في ذلك عنوانه وعدد صفحاته. اطلب من المستخدم إدخال بيانات لثلاثة كتب، ثم طباعة تفاصيلها.

Input

```
Enter details for book 1:
Title: Struct
Number of pages: 60
Enter details for book 2:
Title: Pointer
Number of pages: 65
Enter details for book 3:
Title: String
Number of pages: 50
```

Output

```
Details of book 1:
Title: Struct
Number of pages: 60

Details of book 2:
Title: Pointer
Number of pages: 65

Details of book 3:
Title: String
Number of pages: 50
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Book
struct Book {
    char title[50];
    int pages;
};

int main() {
    // Declare an array of struct Book for three books
    struct Book books[3];

    // Input data for each book
    for (int i = 0; i < 3; i++) {
        printf("Enter details for book %d:\n", i + 1);
        printf("Title: ");
        scanf("%s", books[i].title);
        printf("Number of pages: ");
        scanf("%d", &books[i].pages);
    }

    // Print details of each book
    for (int i = 0; i < 3; i++) {
        printf("\nDetails of book %d:\n", i + 1);
        printf("Title: %s\n", books[i].title);
        printf("Number of pages: %d\n", books[i].pages);
    }

    return 0;
}
```

7- Create a program using a struct named Employee to represent information about an employee, including their name and salary. Ask the user to input data for two employees, then print their details.

قم بإنشاء برنامج باستخدام struct تسمى "Employee " لتمثيل معلومات حول الموظف، بما في ذلك اسمه وراتبه. اطلب من المستخدم إدخال بيانات لاثنين من الموظفين، ثم طباعة التفاصيل الخاصة بهما.

Input

```
Enter details for employee 1:
Name: ahmed
Salary: 100000
Enter details for employee 2:
Name: ali
Salary: 220000
```

Output

```
Details of employee 1:
Name: ahmed
Salary: $100000.00

Details of employee 2:
Name: ali
Salary: $220000.00
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Employee
struct Employee {
    char name[30];
    float salary;
};

int main() {
    // Declare an array of struct Employee for two employees
    struct Employee employees[2];

    // Input data for each employee
    for (int i = 0; i < 2; i++) {
        printf("Enter details for employee %d:\n", i + 1);
        printf("Name: ");
        scanf("%s", employees[i].name);
        printf("Salary: ");
        scanf("%f", &employees[i].salary);
    }

    // Print details of each employee
    for (int i = 0; i < 2; i++) {
        printf("\nDetails of employee %d:\n", i + 1);
        printf("Name: %s\n", employees[i].name);
        printf("Salary: $%.2f\n", employees[i].salary);
    }

    return 0;
}
```

8- Create a program that uses a struct named Circle to represent information about a circle, including its radius and area. Ask the user to input data for three circles, then print their details.

أنشئ برنامجًا يستخدم struct تسمى "Circle " لتمثيل معلومات حول الدائرة، بما في ذلك نصف قطرها ومساحتها. اطلب من المستخدم إدخال بيانات لثلاث دوائر، ثم طباعة تفاصيلها.

Input

```
Enter details for circle 1:
Radius: 5.2
Enter details for circle 2:
Radius: 6.3
Enter details for circle 3:
Radius: 3.2
```

Output

```
Details of circle 1:
Radius: 5.20
Area: 84.91

Details of circle 2:
Radius: 6.30
Area: 124.63

Details of circle 3:
Radius: 3.20
Area: 32.15
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Circle
struct Circle {
    float radius;
    float area;
};

int main() {
    // Declare an array of struct Circle for three circles
    struct Circle circles[3];

    // Input data for each circle
    for (int i = 0; i < 3; i++) {
        printf("Enter details for circle %d:\n", i + 1);
        printf("Radius: ");
        scanf("%f", &circles[i].radius);
        circles[i].area = 3.14 * circles[i].radius * circles[i].radius;
    }

    // Print details of each circle
    for (int i = 0; i < 3; i++) {
        printf("\nDetails of circle %d:\n", i + 1);
        printf("Radius: %.2f\n", circles[i].radius);
        printf("Area: %.2f\n", circles[i].area);
    }

    return 0;
}
```

9- Create a program that uses a struct named Point to represent a point in 2D space with x and y coordinates. Initialize an array of 3 Point structures with some data and print their coordinates.

قم بإنشاء برنامج يستخدم struct تسمى Point لتمثيل نقطة في مساحة ثنائية الأبعاد بإحداثيات x وy. تهيئة array من الهياكل ثلاثية النقاط مع بعض البيانات وطباعة إحداثياتها.

Output

```
Point 1:
x: 2.50
y: 3.00

Point 2:
x: 1.00
y: 4.50

Point 3:
x: -2.00
y: 1.50
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Point
struct Point {
    float x;
    float y;
};

int main() {
    // Declare an array of struct Point
    struct Point points[3] = {
        {2.5, 3.0},
        {1.0, 4.5},
        {-2.0, 1.5}
    };

    // Print coordinates of each point
    for (int i = 0; i < 3; i++) {
        printf("Point %d:\n", i + 1);
        printf("x: %.2f\n", points[i].x);
        printf("y: %.2f\n", points[i].y);
        printf("\n");
    }

    return 0;
}
```

10- Create a program using a struct named Student to represent information about a student, including their name and GPA. Initialize an array of 3 Student structures with some data and print their details.

قم بإنشاء برنامج باستخدام struct تسمى Student لتمثيل معلومات حول الطالب، بما في ذلك اسمه ومعدله التراكمي. تهيئة array مكونة من 3 هياكل طلابية مع بعض البيانات وطباعة تفاصيلها.

Output

```
Student 1:
Name: John
GPA: 3.50

Student 2:
Name: Alice
GPA: 3.80

Student 3:
Name: Bob
GPA: 3.20
```

Solution

```c
// www.gammal.tech
#include<stdio.h>

// Define the struct Student
struct Student {
    char name[30];
    float GPA;
};

int main() {
    // Declare an array of struct Student
    struct Student students[3] = {
        {"John", 3.5},
        {"Alice", 3.8},
        {"Bob", 3.2}
    };

    // Print details of each student
    for (int i = 0; i < 3; i++) {
        printf("Student %d:\n", i + 1);
        printf("Name: %s\n", students[i].name);
        printf("GPA: %.2f\n", students[i].GPA);
        printf("\n");
    }

    return 0;
}
```