Homework Assignment: Working with Structures in C

Instructions:

1. For each problem, use the given structure definition.
2. Write a C program to **scan** (input) data for **5 records** and then **print** these records.
3. Use loops to handle the input and output for multiple records.
4. Save each program as a separate C file based on the filename format provided.

Problem Statements

Problem 1: Student Database

Structure Definition:

```c
struct Student {
    char name[50];
    int age;
    int grade;
    char studentID[10];
};
```

Filename: `student_database.c`

Task: Write a program to input the details of 5 students (name, age, grade, student ID) and print their details.

Problem 2: Library Book Records

Structure Definition:

```c
struct Book {
    char title[100];
    char author[50];
    char ISBN[13];
    int year;
};
```

Filename: `library_books.c`

Task: Write a program to input the details of 5 books (title, author, ISBN, year of publication) and print their information.

Problem 3: Contact Management System

Structure Definition:

```c
struct Contact {
    char name[50];
    char phone[15];
    char email[50];
};
```

Filename: `contact_management.c`

Task: Write a program to input the contact details of 5 people (name, phone, email) and print their information.

Problem 4: Employee Records

Structure Definition:

```c
struct Employee {
    char name[50];
    char position[30];
    float salary;
    int experience;
};
```

Filename: `employee_records.c`

Task: Write a program to input the details of 5 employees (name, position, salary, years of experience) and print their records.

Problem 5: Vehicle Inventory System

Structure Definition:

```c
struct Vehicle {
    char make[20];
    char model[20];
    int year;
    float price;
};
```

Filename: `vehicle_inventory.c`

Task: Write a program to input the details of 5 vehicles (make, model, year, price) and print their information.

Problem 6: Date System

Structure Definition:

```
struct Date {
    int day;
    int month;
    int year;
};
```

Filename: `date_system.c`

Task: Write a program to input 5 dates (day, month, year) and print them in the format `DD/MM/YYYY`.

Problem 7: Complex Numbers

Structure Definition:

```
struct Complex {
    float real;
    float imaginary;
};
```

Filename: `complex_numbers.c`

Task: Write a program to input 5 complex numbers (real and imaginary parts) and print them in the format `a + bi`.

Problem 8: 2D Points

Structure Definition:

```
struct Point2D {
    float x;
    float y;
};
```

Filename: `point2d.c`

Task: Write a program to input 5 points in 2D space (x and y coordinates) and print their coordinates.

Problem 9: Network Packet Representation

Structure Definition:

```c
struct Packet {
    int id;
    char source[15];
    char destination[15];
    char payload[100];
};
```

Filename: `network_packet.c`

Task: Write a program to input 5 network packets (id, source, destination, payload) and print their details.

Problem 10: Rectangle in Graphics

Structure Definition:

```c
struct Rectangle {
    int x;
    int y;
    int width;
    int height;
};
```

Filename: `rectangle_graphics.c`

Task: Write a program to input 5 rectangles (x, y coordinates, width, height) and print their position and dimensions.

Submission:

- Submit each C program file as per the filenames specified.
- Ensure the code is well-commented, compiles, and runs without errors.
- Use meaningful variable names and maintain proper formatting for readability.
