Array Tasks (Sweet Chilli level)

1. Inventory Management System

Scenario:

A warehouse stores items with unique **IDs, names, quantity, and price per unit**. Implement a system that:

1. Uses **pointers to arrays** to store inventory details.
2. Sorts items by **price in descending order**.
3. Finds the **most expensive item** and updates the inventory after a sale.

Sample Data (Before Sorting)

Item ID	Name	Quantity	Price (per unit)
101	Laptop	10	1200
102	Phone	50	800
103	Monitor	20	300
104	Keyboard	100	50
105	Mouse	200	30

Expected Outcome (After Sorting by Price)

Item ID	Name	Quantity	Price (per unit)
101	Laptop	10	1200
102	Phone	50	800
103	Monitor	20	300
104	Keyboard	100	50
105	Mouse	200	30

2. Flight Ticket Reservation System

Scenario:

A travel company stores flight ticket details with **Flight ID, Passenger Name, Seat Number, and Fare**. The system should:

1. Store **N passengers** dynamically.
2. Allow searching for a passenger by **name** using pointers.
3. Update fare for a specific seat.

Sample Flight Data

Flight ID	Passenger Name	Seat No	Fare ($)
F001	Alice	12A	450
F002	Bob	14C	600
F003	Charlie	21B	700
F004	Dave	10D	320
F005	Eve	8E	550

3. Student Marks Management System

Scenario:

A university maintains students' records, including **Student ID, Name, Marks in 3 subjects, and Total Marks**. The system should:

1. Use **pointers to store and update student marks dynamically**.
2. Compute the **total marks** for each student.
3. Find the **student with the highest marks**.

Sample Student Data (Before Computation)

Student ID	Name	Subject 1	Subject 2	Subject 3	Total Marks
S101	John	75	80	90	?
S102	Alice	85	78	88	?
S103	Bob	60	70	65	?
S104	David	90	85	95	?
S105	Eva	78	82	76	?

Expected Output (After Computation)

Student ID	Name	Subject 1	Subject 2	Subject 3	Total Marks
S101	John	75	80	90	245
S102	Alice	85	78	88	251
S103	Bob	60	70	65	195
S104	David	90	85	95	270 (Highest)
S105	Eva	78	82	76	236

4. Hotel Room Booking System

Scenario:

A hotel manages room bookings with **Room ID, Guest Name, Check-in Date, and Number of Nights**. The system should:

1. Use **arrays and pointers to store booking details**.
2. Allow searching for a guest by name.
3. Calculate the total bill assuming a fixed room price per night.

Sample Booking Data

Room ID	Guest Name	Check-in Date	Nights	Price/Night ($)	Total Bill
R101	Smith	10-02-2025	3	100	?
R102	Johnson	12-02-2025	5	150	?
R103	Emily	14-02-2025	2	120	?
R104	Chris	15-02-2025	4	200	?
R105	Alex	16-02-2025	1	90	?

Expected Output (After Bill Calculation)

Room ID	Guest Name	Check-in Date	Nights	Price/Night ($)	Total Bill ($)
R101	Smith	10-02-2025	3	100	300
R102	Johnson	12-02-2025	5	150	750
R103	Emily	14-02-2025	2	120	240
R104	Chris	15-02-2025	4	200	800
R105	Alex	16-02-2025	1	90	90

5. Employee Payroll Management System

Scenario:

A company maintains employees' payroll records with **Employee ID, Name, Basic Salary, Allowances, and Deductions**. The system should:

1. Use **pointers to dynamically allocate and store payroll details**.
2. Calculate **net salary** for each employee.
3. Sort employees by **net salary in descending order**.

Sample Payroll Data (Before Calculation)

Employee ID	Name	Basic Salary	Allowances	Deductions	Net Salary
E101	Alice	5000	1000	500	?
E102	Bob	7000	1500	800	?
E103	Carol	6000	1200	600	?
E104	Dave	7500	2000	900	?
E105	Eve	5500	1100	700	?

Expected Output (After Calculation and Sorting)

Employee ID	Name	Basic Salary	Allowances	Deductions	Net Salary
E104	Dave	7500	2000	900	8600
E102	Bob	7000	1500	800	7700
E103	Carol	6000	1200	600	6600
E105	Eve	5500	1100	700	5900
E101	Alice	5000	1000	500	5500