Data Structures Lab – Hinglish Explanations

Weeks 1–8 • Line-by-line code, dry runs, ASCII diagrams

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Week 1 — Left Rotate Array

Purpose

Array ko **k** times left rotate karna: shuru ke k elements end me chale jaate hain.

Code (C)

```
void leftRotate(int arr[], int n, int k) {{
    k = k % n;
    int temp[k];
    for (int i = 0; i < k; i++) temp[i] = arr[i];
    for (int i = 0; i < n - k; i++) arr[i] = arr[i + k];
    for (int i = 0; i < k; i++) arr[n - k + i] = temp[i];
}}
```

Line-by-line (Hinglish)

- `k = k % n;` k ko range me laata hai.
- `temp[k]` first k elements ke liye buffer.
- `arr[i] = arr[i+k]` se left shift hota hai.
- End me `temp` ko array ke last me paste karte hain.

Dry Run

```
arr = [1 2 3 4 5], k=2
temp = [1 2]
Shift: [3 4 5 _ _]
Paste: [3 4 5 1 2]
```

ASCII Diagram

```
Before: 1 2 3 4 5
Take:   [1 2] -> temp
Shift:  3 4 5 _ _
Place:  3 4 5 1 2
```

Week 2 — Search in Row-Column Sorted Matrix

Top-right se start karke > key to left, < key to down; milte hi success.

Staircase Path

```
(start at top-right)
> key : move left
< key : move down
== key: found
```

Appendix

Notes:

- Complexities in Big-O; ASCII diagrams are monospace-dependent.
- Anchors enable clickable ToC and PDF bookmarks.
- Code blocks and diagrams avoid page breaks mid-block.