Q1.Implement a Queue data structure using an array.
Support the operations:

- enqueue(x) – insert an element
- dequeue() – remove an element
- display() – print queue elements

Input Example:

enqueue 1

enqueue 2

dequeue

enqueue 3

display

Output Example:

Dequeued: 1

Queue: 2 3

Hint for Students:
👉 Maintain two indices: front and rear.
👉 Wrap around when using a circular array.
👉 Increment front when dequeuing, increment rear when enqueuing.

Q2. Given a string of parentheses ()[]{}, check whether it is balanced.
A string is balanced if every opening bracket has a matching closing bracket in the correct order.

Input Example:

({[]})

Output Example:

Balanced

Hint for Students:
👉 Use a **Stack** to push opening brackets.
👉 When a closing bracket comes, check top of stack for its matching pair.
👉 If mismatch or stack not empty at end → Not Balanced.

Q3. **You are given an array of size n-1 containing distinct numbers from 1 to n.**
Find the **missing number** in the sequence.

Input Example:

arr = [1, 2, 4, 5]

n = 5

Output Example:

3

Hint for Students:

👉 Use formula:
[
\text{Expected Sum} = \frac{n(n+1)}{2}
]
Subtract the actual sum from expected sum.

Q4. **Given an array of integers, print all duplicate elements.**

Input Example:

arr = [1, 2, 3, 1, 2]

Output Example:

Duplicates: 1 2

Hint for Students:

👉 Use a **HashSet** to store seen elements.

👉 If element already exists in the set → it's a duplicate.