**Infinite Champions Programme – Day 2 (Assignment Sheet)**

**Instructions  
• Deadline: Submit your solutions by 27th September, 2025, EOD.  
• Platform: Test your solutions on LeetCode  
• Collaboration: Discussing concepts is encouraged, but all code must be your own.**

**1.** [**Merge Sorted Array (88)**](https://leetcode.com/problems/merge-sorted-array/)

* **Problem:** You are given two sorted arrays, nums1 and nums2, where nums1 has extra space at the end to accommodate all elements of nums2. Merge the two arrays into a single sorted array in-place.
* **Objective:** Implement a function that merges two sorted arrays efficiently using pointers from the end.
* **YouTube Solution (Java):** [Merge Sorted Array – Java Solution](https://www.youtube.com/watch?v=8CdySAPnEGY)

**2.** [**Kth Largest Element in an Array (215)**](https://leetcode.com/problems/kth-largest-element-in-an-array/)

* **Problem:** You are given an unsorted array of integers. Find the Kth largest element in the array.
* **Objective:** Implement a function using Quickselect (or a heap) to efficiently determine the Kth largest element.
* **YouTube Solution (Java):** [Kth Largest Element in an Array – Java Solution](https://www.youtube.com/watch?v=XEmy13g1Qxc)

**3.** [**Valid Perfect Square (367)**](https://leetcode.com/problems/valid-perfect-square/)

* **Problem:** You are given a positive integer num. Determine if it is a perfect square without using built-in square root functions.
* **Objective:** Implement a binary search approach on the number range to verify whether a number is a perfect square.
* **YouTube Solution (Java):** [Valid Perfect Square – Java Solution](https://www.youtube.com/watch?v=cW3fTKGT7rU)

**Submission Checklist  
• Time and space complexity analysis for each solution.  
• Test cases demonstrating the correctness of your solutions.**