# Sorting Assignment

## Instructions to Solve:

1. **First Step: Dry Run on Paper**
   - Before writing any code, take a notebook and dry run the given **each** input manually.
   - Step-by-step show how the array changes after each pass/iteration.
   - Clearly write:
     - Current array after each outer loop iteration.
     - Any swaps or comparisons made.
   - **Dry runs are mandatory.**
2. **Second Step: Write the Code**

## 1. Selection Sort Question (Dry run every input)

**Problem:**
Sort an array of integers in non-decreasing order using **Selection Sort**.

**Input 1:**
`[18, 22, 20, 19, 21]`

**Input 2:**
`[34, 12, 56, 45, 23]`

**Expected Output:**

For Input 1: `[18, 19, 20, 21, 22]`
For Input 2: `[12, 23, 34, 45, 56]`

## 2. Bubble Sort Question (Dry run every input)

**Problem:**
Given an array, sort them in **non-decreasing** order using **Bubble Sort**.

**Input 1:**
`[30, 25, 27, 35, 29]`

**Input 2:**
`[15, 10, 25, 40, 30]`

**Expected Output:**
For Input 1: `[25, 27, 29, 30, 35]`

For Input 2: `[10, 15, 25, 30, 40]`

## 3. Insertion Sort Question (Dry run every input)

**Problem:**
Given an array of names, sort them **non-decreasing** using **Insertion Sort**.

**Input 1:**
`[18, 22, 20, 19, 21]`

**Input 2:**
`[34, 12, 56, 45, 23]`

**Expected Output:**
For Input 1: `[18, 19, 20, 21, 22]`

For Input 2: `[12, 23, 34, 45, 56]`

## 4. Merge Sort Question (Dry run every input)

**Problem:**
Sort a large array of random numbers efficiently using **Merge Sort**.

**Input 1:**
`[50, 23, 9, 18, 61, 32]`

**Input 2:**
`[12, 45, 1, 23, 67, 90]`

**Expected Output:**
For Input 1: `[9, 18, 23, 32, 50, 61]`

For Input 2: `[1, 12, 23, 45, 67, 90]`

## 5. Quick Sort Question (Dry run every input)

**Problem:**
Sort an array of integers using **Quick Sort**.

**Input 1:**
`[75, 85, 55, 95, 65]`

**Input 2:**
`[42, 56, 12, 67, 34]`

**Expected Output:**
For Input 1: `[55, 65, 75, 85, 95]`

For Input 2: `[12, 34, 42, 56, 67]`