

Lab 6 DSA Refresher Module

Duration: 04:00 pm to 05:10 pm.

After 5:10 pm, no submissions allowed.

Title: The Bollywood Blockbuster Premiere

Varun is hosting a grand premiere for his latest blockbuster movie. The event promises to be the talk of the town, with stars from all corners of the industry making an appearance. The guest list is dazzling, but the seating arrangement needs to be just perfect to capture the essence of the night. Varun decides to turn this into a fun challenge for his two talented friends - Priya and Arjun, each known for their unique organizational skills.

Priya's Method: The Climax Pivot

Priya decides to use the final star on the guest list as her pivot. Much like the climax of a movie, the final guest is pivotal to the arrangement. She divides the guest list so that all stars with lesser or equal fame to this final guest sit before, and the more famous ones sit after.

Example:

Varun hands over the guest list with 5 stars: [4, 1, 3, 9, 7]. Priya springs into action.

Input:

- $N = 5$
- $\text{Guests[]} = \{4, 1, 3, 9, 7\}$

Output:

- Arranged Guests: 1 3 4 7 9

Steps Priya follows:

1. Choose the last guest (7) as the pivot.
2. Arrange guests so those with lesser stardom than 7 are before it and those with greater stardom are after it.

Arjun's Method: The Opening Scene Pivot

Arjun prefers to start with the first guest as the pivot, like the opening scene of a movie that sets the stage for the story. He arranges the other guests around this star, ensuring that those with lesser or equal fame are seated before, and those with greater fame are seated after.

Example:

Varun then asks Arjun to take a shot at the same list: [4, 1, 3, 9, 7].

Input:

- N = 5
- Guests[] = {4, 1, 3, 9, 7}

Output:

- Arranged Guests: 1 3 4 7 9

Steps Arjun follows:

1. Choose the first guest (4) as the pivot.
2. Arrange guests so those with lesser stardom than 4 are before it and those with greater stardom are after it.

As the evening unfolds, Varun watches his friends Priya and Arjun work their magic. The stars are seated in perfect harmony, creating a mesmerizing atmosphere at the premiere. The paparazzi can't get enough of the arranged event, and Varun's premiere becomes the most talked-about event of the year.

Assignment:

Your task is to help Priya and Arjun by implementing both of their Quick Sort methods:

1. **Priya's Method:** Use the last element as the pivot and sort the array such that all elements less than or equal to the pivot lie before it, and elements greater than it lie after the pivot.
2. **Arjun's Method:** Use the first element as the pivot and sort the array such that all elements less than or equal to the pivot lie before it, and elements greater than it lie after the pivot.

You can write both the functions into a single .cpp file and print the output.

Test your implementation with the following guest list:

Input:

- N = 5
- arr[] = {4, 1, 3, 9, 7}

Expected Output: 1 3 4 7 9