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Batch: A1

Program:

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#include <stdio.h>

void quicksort(int arr[], int p, int r);
int partition(int arr[], int p, int r);`1

int main() {
  int n;
  printf("Enter the number of elements: ");
  scanf("%d", &n);

  int arr[n];
  printf("\nEnter the elements of the array: ");
  for (int i = 0; i < n; i++) {
    scanf("%d", &arr[i]);
  }

  printf("\nArray before sorting: ");
  for (int i = 0; i < n; i++) {
    printf("%d ", arr[i]);
  }

  int p = 0, r = n - 1;
  quicksort(arr, p, r);

  printf("\nArray after sorting: ");
  for (int i = 0; i < n; i++) {
    printf("%d ", arr[i]);
  }
  return 0;
```

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}

void quicksort(int arr[], int p, int r) {
  if (p < r) {
     int q = partition(arr, p, r);
     quicksort(arr, p, q - 1);
     quicksort(arr, q + 1, r);
  }
}

int partition(int arr[], int p, int r) {
  int x = arr[r];
  int i = p - 1;
  int temp;
  for (int j = p; j < r; j++) {
     if (arr[j] <= x) {
        i++;
        temp = arr[i];
        arr[i] = arr[j];
        arr[j] = temp;
     }
  }
  temp = arr[i + 1];
  arr[i + 1] = arr[r];
  arr[r] = temp;
  return i + 1;
}
```

Output:

Enter the number of elements: 5

Enter the elements of the array: 5 6 8 12 59

Array before sorting: 5 6 8 12 59
Array after sorting: 5 6 8 12 59