

DAA Assignment 2

```
#include <iostream>

using namespace std;

class QuickSort {
public:
    void sortWithPivot(int arr[], int size, char pivotType) {
        quickSort(arr, 0, size - 1, pivotType);
    }

private:
    void quickSort(int arr[], int low, int high, char pivotType) {
        if (low < high) {
            int pi = partition(arr, low, high, pivotType);
            quickSort(arr, low, pi - 1, pivotType);
            quickSort(arr, pi + 1, high, pivotType);
        }
    }

    int partition(int arr[], int low, int high, char pivotType) {
        int pivot;
        if (pivotType == 's') { // 's' for start
            pivot = arr[low];
        } else if (pivotType == 'm') { // 'm' for middle
            pivot = arr[low + (high - low) / 2];
            swap(arr[low + (high - low) / 2], arr[high]);
        } else { // 'e' for end
            pivot = arr[high];
        }

        int i = low - 1;
        for (int j = low; j < high; j++) {
```

```

        if (arr[j] < pivot) {
            i++;
            swap(arr[i], arr[j]);
        }
    }
    swap(arr[i + 1], arr[high]); // Place pivot at correct position
    return i + 1;
}
};

```

```

int main() {
    int size;

    cout << "Enter the size of the array: ";
    cin >> size;

    int* arr = new int[size];
    cout << "Enter the elements of the array: ";
    for (int i = 0; i < size; i++) {
        cin >> arr[i];
    }
}

```

```

QuickSort qs;

```

```

bool continueSorting = true;
while (continueSorting) {
    char pivotChoice;

    cout << "Choose pivot type (s for start, m for middle, e for end): ";
    cin >> pivotChoice;

    // Perform the sort with the chosen pivot type
    qs.sortWithPivot(arr, size, pivotChoice);
}

```

```

// Display sorted array

cout << "Sorted array with ";

if (pivotChoice == 's') {

    cout << "start";

} else if (pivotChoice == 'm') {

    cout << "middle";

} else {

    cout << "end";

}

cout << " pivot: ";

for (int i = 0; i < size; i++) cout << arr[i] << " ";

cout << endl;


// Ask user if they want to continue

char choice;

cout << "Do you want to sort with another pivot type? (y/n): ";

cin >> choice;

continueSorting = (choice == 'y' || choice == 'Y');

}

delete[] arr;

return 0;

}

```

Output:

```

C:\Users\Admin\Downloads\assig2.exe
Enter the size of the array: 10
Enter the elements of the array: 32
34
23
56
78
45
65
24
13
79
Choose pivot type (s for start, m for middle, e for end): e
Sorted array with end pivot: 13 23 24 32 34 45 56 65 78 79
Do you want to sort with another pivot type? (y/n): y
Choose pivot type (s for start, m for middle, e for end): m
Sorted array with middle pivot: 13 23 24 32 34 45 56 65 78 79
Do you want to sort with another pivot type? (y/n): y
Choose pivot type (s for start, m for middle, e for end): s
Sorted array with start pivot: 79 13 23 24 32 34 45 56 65 78
Do you want to sort with another pivot type? (y/n): n

-----
Process exited after 43.08 seconds with return value 0
Press any key to continue . . .

```