

# **Application Based on Quick Sort**

## **Title : Hospital Queue System**

### **Program Code :**

```
#include <stdio.h>
```

```
#define SIZE 50
```

```
struct Patient {
```

```
    int id;
```

```
    int priority;
```

```
};
```

```
void swap(struct Patient *x, struct Patient *y) {
```

```
    struct Patient temp = *x;
```

```
    *x = *y;
```

```
    *y = temp;
```

```
}
```

```
int partition(struct Patient arr[], int low, int high) {
```

```
    int pivot = arr[low].priority;
```

```
    int start = low;
```

```
    int end = high;
```

```
    while (start < end) {
```

```
        while (arr[start].priority >= pivot && start < high)
```

```

        start++;
        while (arr[end].priority < pivot)
            end--;
        if (start < end)
            swap(&arr[start], &arr[end]);
    }
    swap(&arr[low], &arr[end]);
    return end;
}

void quick_sort(struct Patient arr[], int low, int high) {
    if (low < high) {
        int loc = partition(arr, low, high);
        quick_sort(arr, low, loc - 1);
        quick_sort(arr, loc + 1, high);
    }
}

int main() {
    struct Patient arr[SIZE];

    int n, i;

    printf("Enter number of patients (max %d): ", SIZE);

```

```
scanf("%d", &n);

printf("Enter patient IDs and priority levels (1 to 100):\n");

for (i = 0; i < n; i++) {

    printf("Patient %d ID: ", i + 1);

    scanf("%d", &arr[i].id);

    printf("Priority: ");

    scanf("%d", &arr[i].priority);

}

quick_sort(arr, 0, n - 1);

printf("\nPatients sorted by priority (highest first):\n");

printf("ID\tPriority\n");

for (i = 0; i < n; i++) {

    printf("%d\t%d\n", arr[i].id, arr[i].priority);

}

return 0;

}
```

**Output :**

C:\Users\USER\Desktop\241410128\Application Quick Sort new.exe

```
Enter number of patients (max 50): 4
Enter patient IDs and priority levels (1 to 100):
Patient 1 ID: 5
Priority: 90
Patient 2 ID: 6
Priority: 85
Patient 3 ID: 7
Priority: 70
Patient 4 ID: 8
Priority: 98

Patients sorted by priority (highest first):
ID      Priority
8       98
5       90
6       85
7       70

-----
Process exited after 57.43 seconds with return value 0
Press any key to continue . . .
```