**Q10: Sorting Patient Data in a Hospital**: Design an algorithm to sort patient data based on emergency levels using **heap sort**. Ensure that the sorting happens in real-time for critical situations in an emergency room.

<!DOCTYPE html>

<html lang="en">

<head>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>Heap Sort - Hospital Patient Data</title>

<style>

body {

font-family: Arial, sans-serif;

margin: 20px;

padding: 10px;

background-color: #e0f7fa;

}

#patientData {

font-size: 16px;

margin-top: 20px;

}

.sorted-list {

color: green;

}

.unsorted-list {

color: red;

}

</style>

</head>

<body>

<h1>Sort Patient Data by Emergency Levels using Heap Sort</h1>

<div>

<button onclick="sortPatients()">Sort Patients</button>

</div>

<div id="patientData" class="unsorted-list">

<p><strong>Unsorted Patient Data (Emergency Level):</strong></p>

<p>Patient Data: [{"name": "John", "emergency": 2}, {"name": "Alice", "emergency": 1}, {"name": "Bob", "emergency": 3}]</p>

</div>

<div id="sortedResult" class="sorted-list"></div>

<script>

let patients = [

{ name: 'John', emergency: 2 },

{ name: 'Alice', emergency: 1 },

{ name: 'Bob', emergency: 3 }

];

// Helper function to heapify the array

function heapify(arr, n, i) {

let largest = i;

const left = 2 \* i + 1;

const right = 2 \* i + 2;

if (left < n && arr[left].emergency > arr[largest].emergency) {

largest = left;

}

if (right < n && arr[right].emergency > arr[largest].emergency) {

largest = right;

}

if (largest !== i) {

[arr[i], arr[largest]] = [arr[largest], arr[i]]; // Swap

heapify(arr, n, largest);

}

}

// Heap Sort function

function heapSort(arr) {

const n = arr.length;

// Build max heap

for (let i = Math.floor(n / 2) - 1; i >= 0; i--) {

heapify(arr, n, i);

}

// Extract elements from heap

for (let i = n - 1; i >= 0; i--) {

[arr[0], arr[i]] = [arr[i], arr[0]]; // Swap

heapify(arr, i, 0);

}

}

// Sort and display result

function sortPatients() {

heapSort(patients);

let resultHTML = '<p><strong>Sorted Patient Data (Emergency Level):</strong></p>';

resultHTML += '<p>' + JSON.stringify(patients) + '</p>';

document.getElementById('sortedResult').innerHTML = resultHTML;

document.getElementById('patientData').className = 'sorted-list';

}

</script>

</body>

</html>