

Huffman coding using Greedy Method

```
import java.util.PriorityQueue;

class Node implements Comparable<Node> {

    char ch;

    int freq;

    Node left, right;

    Node(char ch, int freq) {

        this.ch = ch;

        this.freq = freq;

        this.left = null;

        this.right = null;

    }

    Node(int freq, Node left, Node right) {

        this.ch = '-';

        this.freq = freq;

        this.left = left;

        this.right = right;

    }

    public int compareTo(Node n) {

        return this.freq - n.freq;

    }

}

public class HuffmanCodingGreedy {

    public static void printCodes(Node root, String code) {

        if (root == null) return;
```

```

    if (root.left == null && root.right == null && root.ch != '-') {

        System.out.println(root.ch + " : " + code);

        return;
    }

    printCodes(root.left, code + "0");

    printCodes(root.right, code + "1");
}

public static void main(String[] args) {

    char[] chars = {'A', 'B', 'C', 'D', 'E'};

    int[] freq = {5, 9, 12, 13, 16};

    PriorityQueue<Node> pq = new PriorityQueue<>();

    // Step 1: Create leaf nodes and add to priority queue
    for (int i = 0; i < chars.length; i++) {

        pq.add(new Node(chars[i], freq[i]));
    }

    // Step 2: Apply greedy approach (similar to Optimal Merge Pattern)
    while (pq.size() > 1) {

        Node left = pq.poll();

        Node right = pq.poll();

        Node merged = new Node(left.freq + right.freq, left, right);

        pq.add(merged);
    }

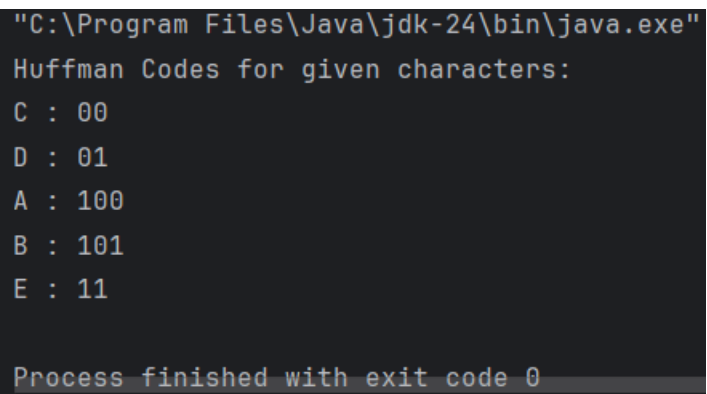
    // Step 3: Print Huffman codes

    Node root = pq.peek();

```

```
        System.out.println("Huffman Codes for given characters:");  
        printCodes(root, "");  
    }  
}
```

Output



A screenshot of a terminal window showing the output of a Java program. The first line is the command prompt: "C:\Program Files\Java\jdk-24\bin\java.exe". The program output is as follows:

```
Huffman Codes for given characters:  
C : 00  
D : 01  
A : 100  
B : 101  
E : 11  
  
Process finished with exit code 0
```