Practical – 4

Aim: Implement Huffman Code to generate binary code when symbol and probabilities are given.

Program:

```java
package new_package;

import java.util.PriorityQueue;

import java.util.Scanner;

import java.util.Comparator;

class HuffmanNode {

        int data;

    char c;

    HuffmanNode left;

        HuffmanNode right;

}

class MyComparator implements Comparator<HuffmanNode> {

        public int compare(HuffmanNode x, HuffmanNode y) {

                return x.data - y.data;

        }

}

public class prac4{

        public static void printCode(HuffmanNode root, String s) {

                if (root.left== null &&  root.right== null && Character.isLetter(root.c)) {

                        System.out.println(root.c + ":" + s);

                        return;

                }

                printCode(root.left, s + "0");

                printCode(root.right, s + "1");

        }

        public static void main(String[] args) {

                Scanner s = new Scanner(System.in);
```

```
        int n = 6;

        char[] charArray = { 'a', 'b', 'c', 'd', 'e', 'f' };

        int[] charfreq = { 5, 9, 12, 13, 16, 45 };

        PriorityQueue<HuffmanNode> q = new PriorityQueue<HuffmanNode>(n, new
MyComparator());

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

                HuffmanNode hn = new HuffmanNode();

                hn.c = charArray[i];

        hn.data = charfreq[i];

        hn.left = null;

        hn.right = null;

        q.add(hn);

        }

        HuffmanNode root = null;

        while (q.size() > 1)

        {

                HuffmanNode x = q.peek();

                q.poll();

                HuffmanNode y = q.peek();

                q.poll();

        HuffmanNode f = new HuffmanNode();

        f.data = x.data + y.data;

        f.c = '-';

        f.left = x;

                f.right = y;

                root = f;

                q.add(f);

        }

        printCode(root, "");

    }
```
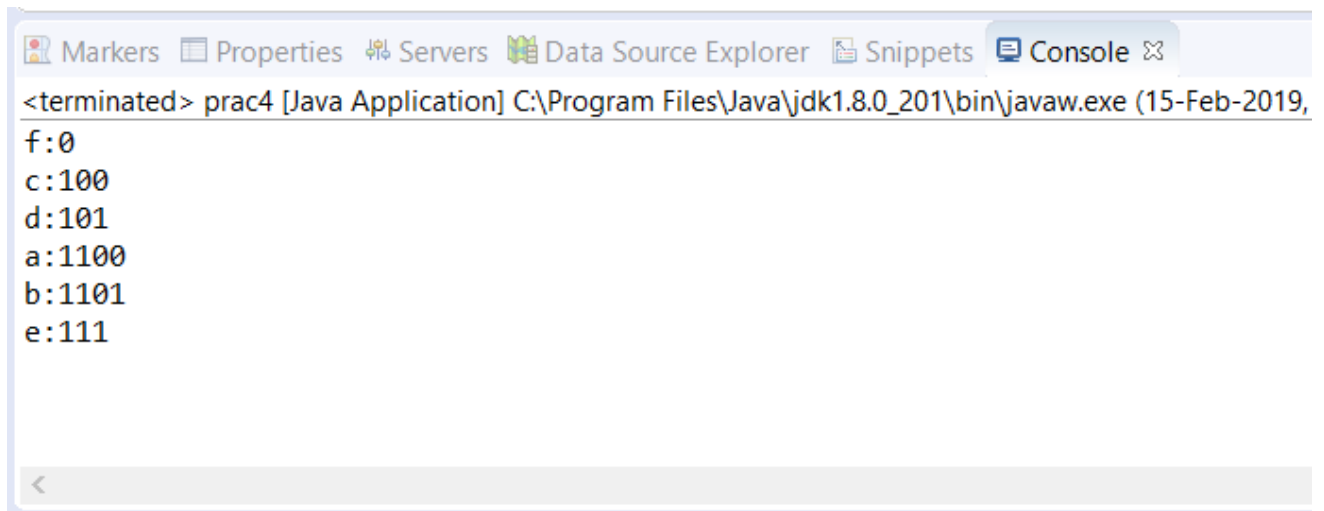
}

Output:

```
Markers  Properties  Servers  Data Source Explorer  Snippets  Console 
<terminated> prac4 [Java Application] C:\Program Files\Java\jdk1.8.0_201\bin\javaw.exe (15-Feb-2019,
f:0
c:100
d:101
a:1100
b:1101
e:111
```