

Code:

```
2 import heapq
3 class Node:
4     def __init__(self, freq, symbol, left=None, right=None):
5         self.freq = freq
6         self.symbol = symbol
7         self.left = left
8         self.right = right
9         self.huff = ""
10
11     def __lt__(self, nxt):
12         return self.freq < nxt.freq
13
14 def printNodes(node, val=""):
15     newVal = val + str(node.huff)
16     if node.left:
17         printNodes(node.left, newVal)
18     if node.right:
19         printNodes(node.right, newVal)
20     if not node.left and not node.right:
21         print(f"{node.symbol} -> {newVal}")
22
23 chars = ["a", "b", "c", "d", "e", "f"]
24 freq = [5, 9, 12, 13, 16, 45]
25 nodes = []
26 for x in range(len(chars)):
27     heapq.heappush(nodes, Node(freq[x], chars[x]))
28 while len(nodes) > 1:
29     left = heapq.heappop(nodes)
30     right = heapq.heappop(nodes)
31     left.huff = 0
32     right.huff = 1
33     newNode = Node(left.freq + right.freq, left.symbol + right.symbol, left, right)
34     heapq.heappush(nodes, newNode)
35
36 print("Huffman Tree : ")
37 printNodes(nodes[0])
```

Output:

```
Windows PowerShell
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PS E:\BE\41427_LP-III_Codes\DAA> & C:/Users/abhi/AppData/Local/Programs/Python/Python311/python.exe e:/BE/41427_LP-III_Codes/DAA/41427_LP-III_A2.py
Huffman Tree :
f -> 0
c -> 100
d -> 101
a -> 1100
b -> 1101
e -> 111
PS E:\BE\41427_LP-III_Codes\DAA>
```