Practical No 2

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Code :

```python
import heapq


class node:
    def __init_(self, freq, symbol, left=None, right=None):
        self.freq = freq
        self.symbol = symbol
        self.left = left
        self.right = right
        self.huff = ""


    def __lt__(self, other):
        return self.freq < other.freq


def printNodes(node, val=""):
    newval = val + node.huff
    if node.left:
        printNodes(node.left, newval)
    if node.right:
        printNodes(node.right, newval)
    else:
        print(f"{node.symbol} -> {newval}")


chars = ["a", "b", "c", "d", "e", "f"]
freqs = [5, 9, 12, 13, 16, 45]
nodes = []
```
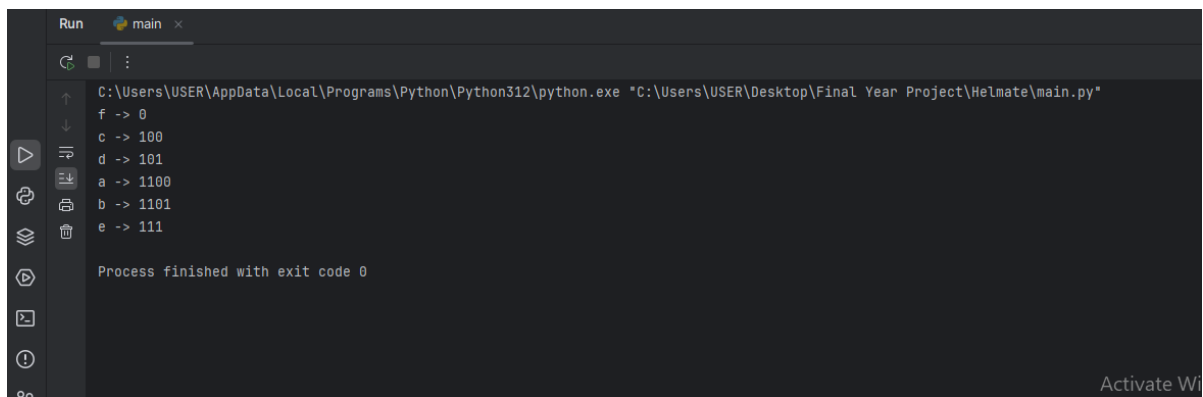
```python
for i in range(len(chars)):
    heapq.heappush(nodes, node(freqs[i], chars[i]))


while len(nodes) > 1:
    left = heapq.heappop(nodes)
    right = heapq.heappop(nodes)
    left.huff = "0"
    right.huff = "1"
    newnode = node(left.freq + right.freq, left.symbol + right.symbol, left, right)
    heapq.heappush(nodes, newnode)


printNodes(nodes[0])
```

Output :-

```
Run    main ×

C:\Users\USER\AppData\Local\Programs\Python\Python312\python.exe "C:\Users\USER\Desktop\Final Year Project\Helmate\main.py"
f -> 0
c -> 100
d -> 101
a -> 1100
b -> 1101
e -> 111

Process finished with exit code 0
```