

```
# Huffman Coding in python
```

```
#string = 'BCAADDCCACACAC'
```

```
string='AAAAAABCCCCCDEEEEE'
```

```
# Creating tree nodes
```

```
class NodeTree(object):
```

```
    def __init__(self, left=None, right=None):
```

```
        self.left = left
```

```
        self.right = right
```

```
    def children(self):
```

```
        return (self.left, self.right)
```

```
    def nodes(self):
```

```
        return (self.left, self.right)
```

```
    def __str__(self):
```

```
        return '%s_%s' % (self.left, self.right)
```

```
# Main function implementing huffman coding
```

```
def huffman_code_tree(node, left=True, binString=""):
```

```
    if type(node) is str:
```

```
        return {node: binString}
```

```
    (l, r) = node.children()
```

```
    d = dict()
```

```
    d.update(huffman_code_tree(l, True, binString + '0'))
```

```
    d.update(huffman_code_tree(r, False, binString + '1'))
```

```
    return d
```

```
# Calculating frequency
```

```
freq = {}
```

```
for c in string:
```

```
    if c in freq:
```

```
        freq[c] += 1
```

```
    else:
```

```
        freq[c] = 1
```

```
freq = sorted(freq.items(), key=lambda x: x[1], reverse=True)
```

```
nodes = freq
```

```
while len(nodes) > 1:
```

```
    (key1, c1) = nodes[-1]
```

```
    (key2, c2) = nodes[-2]
```

```

nodes = nodes[:-2]
node = NodeTree(key1, key2)
nodes.append((node, c1 + c2))

nodes = sorted(nodes, key=lambda x: x[1], reverse=True)

```

```
huffmanCode = huffman_code_tree(nodes[0][0])
```

```

print(' Char | Huffman code ')
print('-----')
for (char, frequency) in freq:
    print(' %-4r | %12s' % (char, huffmanCode[char]))

```

OUTPUT:

```

huffman.py - Visual Studio Code
PROBLEMS OUTPUT TERMINAL JUPYTER DEBUG CONSOLE
Python + - 
Copyright (C) Microsoft Corporation. All rights reserved.
Try the new cross-platform PowerShell https://aka.ms/pscore6
PS C:\Users\Asus> & C:/Users/Asus/AppData/Local/Programs/Python/Python39/python.exe "c:/Users/Asus/Desktop/Harshada Docs/LP-II/Python39/python.exe "c:/Users/Asus/Desktop/Harshada Docs/LP-II I Practical Assignments with Write-up format/machine 1/LP-III Practical Assignments with Write-up format/daa/huffman.py"
Char | Huffman code
-----
'C' | 0
'A' | 11
'D' | 101
'B' | 100
PS C:\Users\Asus> & C:/Users/Asus/AppData/Local/Programs/Python/Python39/python.exe "c:/Users/Asus/Desktop/Harshada Docs/LP-III Practical Assignments with Write-up format/machine 1/LP-III Practical Assignments with Write-up format/daa/huffman.py"
Char | Huffman code
-----
'A' | 11
'C' | 10
'E' | 01
'D' | 001
'B' | 000
PS C:\Users\Asus> & C:/Users/Asus/AppData/Local/Programs/Python/Python39/python.exe "c:/Users/Asus/Desktop/Harshada Docs/LP-III Practical Assignments with Write-up format/machine 1/LP-III Practical Assignments with Write-up format/daa/huffman.py"
Char | Huffman code
-----

```