Multimedia Technology (Lab)

Assignment 5

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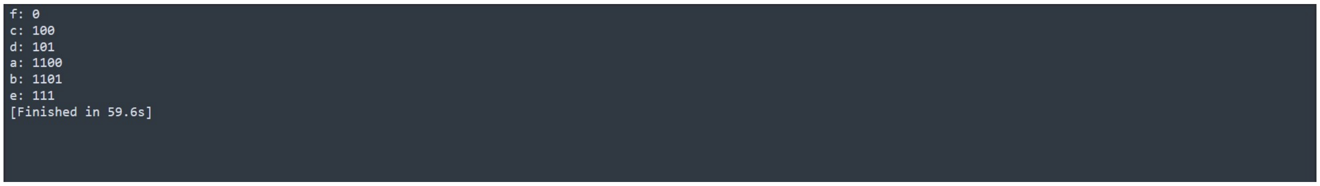
Program 5:Implement a Huffman coding and decoding for Text compression

Code

```
#include <bits/stdc++.h>
using namespace std;
struct MinHeapNode {
  char data;
  unsigned freq;
  MinHeapNode *left, *right;
  MinHeapNode(char data, unsigned freq)
  {
    left = right = NULL;
    this->data = data;
    this->freq = freq;
  }
};
struct compare {
  bool operator()(MinHeapNode* l, MinHeapNode* r)
  {
    return (l->freq > r->freq);
  }
};
void printCodes(struct MinHeapNode* root, string str)
{

  if (!root)
```

```
    return;

  if (root->data != '$')
    cout << root->data << ": " << str << "\n";

  printCodes(root->left, str + "0");
  printCodes(root->right, str + "1");
}
void HuffmanCodes(char data[], int freq[], int size)
{
  struct MinHeapNode *left, *right, *top;
  priority_queue<MinHeapNode*, vector<MinHeapNode*>, compare> minHeap;

  for (int i = 0; i < size; ++i)
    minHeap.push(new MinHeapNode(data[i], freq[i]));
    while (minHeap.size() != 1) {
    left = minHeap.top();
    minHeap.pop();

    right = minHeap.top();
    minHeap.pop();
    top = new MinHeapNode('$', left->freq + right->freq);

    top->left = left;
    top->right = right;

    minHeap.push(top);
  }
  printCodes(minHeap.top(), "");
}
int main()
{
  char arr[] = { 'a', 'b', 'c', 'd', 'e', 'f' };
  int freq[] = { 5, 9, 12, 13, 16, 45 };
  int size = sizeof(arr) / sizeof(arr[0]);


  HuffmanCodes(arr, freq, size);


  return 0;
}
```

Output:



```
f: 0
c: 100
d: 101
a: 1100
b: 1101
e: 111
[Finished in 59.6s]
```