PH360
Assignment 2
Jing Jiang
Merkle-tree Deliverable

Figure 1. The output code.

```python
if __name__ == "__main__":
    m = Merkle_tree(['a', 'b', 'c', 'd', 'r'])
    m.generate_tree()
    print ('\n')

    # get root
    print ("root:", m.get_root())
    print ('\n')

    # check the membership of 'c' with its index 2
    print (m.proof_membership(2, hashlib.sha256('c'.encode()).hexdigest()))
    print ('\n')

    # check the non-membership of 'g' at an index of 1
    print (m.proof_membership(1, hashlib.sha256('g'.encode()).hexdigest()))
    print ('\n')

    # check the membership of 'r' with its index 4, showing that it works under odd number of data
    print (m.proof_membership(4, hashlib.sha256('r'.encode()).hexdigest()))
    print ('\n')
```

Figure 2. The output results