

PH360

Assignment 2

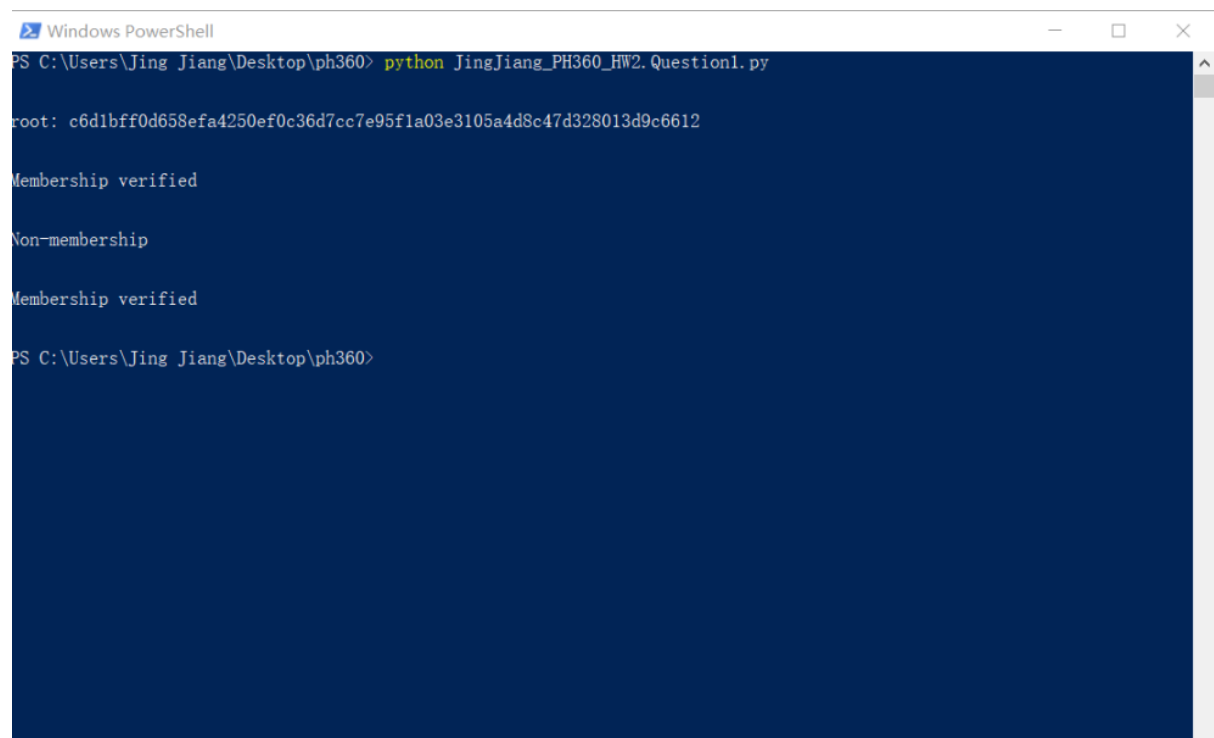
Jing Jiang

Merkle-tree Deliverable

Figure 1. The output code.

```
80
81 if __name__ == "__main__":
82     m = Merkle_tree(['a', 'b', 'c', 'd', 'r'])
83     m.generate_tree()
84     print ('\n')
85
86     # get root
87     print ("root:", m.get_root())
88     print ('\n')
89
90     # check the membership of 'c' with its index 2
91     print (m.proof_membership(2, hashlib.sha256('c'.encode()).hexdigest()))
92     print ('\n')
93
94     # check the non-membership of 'g' at an index of 1
95     print (m.proof_membership(1, hashlib.sha256('g'.encode()).hexdigest()))
96     print ('\n')
97
98     # check the membership of 'r' with its index 4, showing that it works under odd number of data
99     print (m.proof_membership(4, hashlib.sha256('r'.encode()).hexdigest()))
100    print ('\n')
```

Figure 2. The output results



```
Windows PowerShell
PS C:\Users\Jing Jiang\Desktop\ph360> python JingJiang_PH360_HW2.Question1.py

root: c6dlbfff0d658efa4250ef0c36d7cc7e95f1a03e3105a4d8c47d328013d9c6612

Membership verified

Non-membership

Membership verified

PS C:\Users\Jing Jiang\Desktop\ph360>
```