Practical 5 Create a mining function and test it

In [1]:
```
import hashlib
import binascii
import Crypto  #If not installed run pip install crypto and pip install pycryptodome
import Crypto.Random
from Crypto.Hash import SHA
from Crypto.PublicKey import RSA
from Crypto.Signature import PKCS1_v1_5
```

In [2]:
```
def sha256(message):
    return hashlib.sha256(message.encode('ascii')).hexdigest()
```

In [3]:
```
def mine(message, difficulty=1):
    assert difficulty >= 1
    prefix = '1' * difficulty
    for i in range(1000):
        digest = sha256(str(hash(message)) + str(i))
        if digest.startswith(prefix):
            print ("after " + str(i) + " iterations found nonce: "+ digest)
    return digest
```

In [4]:
```
mine("hello",2)
```

```
after 834 iterations found nonce: 1106d95d857f09190c35a723d0f0870861fd363339db5475222bd95e31325e6f
after 849 iterations found nonce: 11ddec690ef244df35afb2015f184f7f6870efc3833ce5abe38fc63978489c9e
```

Out[4]:
```
'b2aa2ebb9401a5829fbd90e198b71d734ca91a3a223ab4229628026540464640'
```