

```
In [1]: import hashlib
import time
class IPv6_VPN_Proxy:
    def __init__(self):
        self.mapper = "abcdef0123456789"
        self.Database = {}

    def encode(self, ipv6: str) -> str:
        tagID = ""
        hash = hashlib.sha512()
        while tagID in self.Database.keys() or tagID == "":
            tagID = ""
            hash.update(str(time.time()).encode('utf-8'))
            string = hash.hexdigest()
            for i in range(0, len(string), 21):
                tagID += self.mapper[self.decodeHex2Int(string[i:i+33])%16]
        self.Database[tagID] = ipv6
        return tagID

    def decode(self, tagID: str) -> str:
        if tagID in self.Database.keys():
            return self.Database[tagID]
        return ""

    def decodeHex2Int(self, hexcode):
        dictionary = {'a':10, 'b':11, 'c':12, 'd':13, 'e':14, 'f':15}
        ints = 0
        for x in range(0, len(hexcode)):
            i = hexcode[x]
            if i != " ":
                first = i.lower()
                if first in dictionary.keys():
                    first = dictionary[first]
                ints += int(first)
        return ints

    def returnDatabaseLength(self):
        return len(self.Database)
```

```
In [2]: proxyAddr = IPv6_VPN_Proxy()
```

```
In [3]: proxyAddr.decode(proxyAddr.encode('aaaa::102'))
```

Out[3]: 'aaaa::102'

```
In [4]: def generateIPv6Adresses(amount):
import random
examples = []
dictionary = {10:'a', 11:'b', 12:'c', 13:'d', 14:'e', 15:'f'}
for i in range(amount):
    temp = ""
    for x in range(2, 16):
        section = ""
        for y in range(random.randint(1,4)):
            character = random.randint(0,15)
            if character > 9:
                character = dictionary[character]
            section += str(character)
        temp += section + ":"
    examples.append(temp[:-1])
return examples
```

```
In [6]: for i in generateIPv6Adresses(100):
temp = proxyAddr.encode(i)
back = proxyAddr.decode(temp)
print(back, temp)
print(proxyAddr.returnDatabaseLength())
```

e2:d0:e:8:fb2b:25:33:2:1c:1be:a442:8:b4:0 e2531fa
559:865:f:3:db:50cb:7ea:c:99:d7f7:8:bef:7:25 c695f47
d:2:f:6d0:10c:04:c:893f:9:ce:46:20c:88ee:463 6410d09
5d:5c:96:d0:a6:84c:38:bb:5:62:a0:8:31b1:5 05b6a9f
69:e5db:8606:8a6:3b:b813:d:9:4:7ed:1:e0e6:5d8:90c a4a5306
810f:25:056d:c93d:c:43:08a7:1d:088:b950:3:d6:2227:447 d0d2315
9:f7:b3c:70:de:42:39:259:f7:5c6:d3b1:298c:4f6:d1 209fcb5
ad1:881:d938:0d:41ab:593:341:f7:880b:df6e:fc6a:227e:3a6c:e832 88dfd4b
00df:a7ac:8:1e5c:e01d:70f:4470:cc4:3cc1:d1:73b:b:809:0524 c992fa4
7a:5:9:d80:61b:7c1:fa:1:b:7:ad98:36:60:7d d27ec13
9a:0d:80:5f:8:713:b:bc:b2:a65:0:9:c9:cea3 1254a25
7d5:30:120c:12:a:4:74c:f18:3:7b2:a02:ae54:71:1e fd358fc
ee:3ef:319d:55:b81:b5d:c:7:6:ab:4da:cbb:9:efd a318214
3:03a:3c:a3f6:37:16:c09:0:6d:4a:f9:8:2f7e:4fb 9013191
6:65f:fe:061:2ee6:6a:bc3a:1:c:5:f:4:6be:0c3 6ad3fa2
b2:8:e7d:d85f:448:85:e577:9af7:9c:8:5b8:0a5c:58ea:0ff7 a9e8d7e
1deb:0b8:551:4f34:f:7e:0b:08a:6396:e3:4:c55:5a5d:1 fc5e442
5:68f9:2f2:a:266:68:8531:4b:96bc:c:d:7c9c:845a:4 cf3200d
02:32:3:a:3bd:ee:afd1:91d:50:200c:b16e:0f:6:4 8e98991
bdf8:32f:5578:a84:689f:ce2:4378:8f4:5c26:2:8d2:33:32a:85 9c76c54
f:62:c6:b9ff:4:192:d:6a25:8b:ee11:cc:f73b:3e9:4e81 e4399f6
4:0f:205:5:a0:bc28:36c9:5777:3:6a:8:3:8b7:044f 9ced89c
c27d:9:6:95:0d:ed:1996:f7af:90:0:f64:73:f:e64 202e4f9
2:58:26:5fc:71:9d37:d3:8b:c701:8:f795:ac3:1e95:e2 b832d5a
ac:c081:7bb4:fdcb:3fb8:2c:6:c:d6d:6a1:92:0:a:b0d9 1cfcdd2
f78c:9724:2e12:4aa6:22e:78:b:c:966:04c:a:d:b:b3d 7a5a7cf
d2:00:6d0:9:5:d:2f1d:65d:c4:432:6aa:4:fa3:116 8ea1e02
0ac4:eacf:6e:ec:27:7:2f25:cd:8:d002:95ea:55f5:df:5 d9c5a75
752:e7f:dfa8:82e:afe:9:26ad:9a1:7:1f9:6:73b:d0:551 31eacaf
5d36:5f7:0:5db:a7cd:5b47:5:c:6:bd93:6:d17:92f:40 5da2069
8:b808:8c:bd:4:28f2:c:13:1:acd:d:83a3:c07:980 faba30c
26fc:d:4:e44a:4:6414:79bc:314a:d273:cef6:8:ed:3d4:6e7 37e4c17
efbc:e:a39:2:e873:e8c:1d20:c9ce:c6b:a1:f:b1c:7:1fee b12ba24
e84:319f:9:a2:1ca3:6f:8dac:e:06:d:7af4:2:4:9b9 771fa04
6f:0092:4:75:a:ab:a8e:5d:4d:1f:0342:192:2:de75 6d6fb57
9e4:2a:55a4:b9:188:fa2:37:7db:7cc:d:17:4:ebae:7 14dec72
bd2f:a4:c82:8b06:e37:a2a5:283:0e2:fa:b491:73:25:e277:b8 85b704c
7:aa47:e:0c3:300:b71:6:aba6:c51:8000:712:dc3:d:0d23 3ceb15f
079:9f4e:2:7:5:25:241b:f33c:a9:fa:c32:dd5:43:81d 495d298
b3c1:3:1:afd:6:1e:e:4b:c:fea:083:784e:ad4c:6f2d f93ab5d
f:4738:8936:e1:32:bdb:dc08:c4:4:7d:06a4:9ffa:7:8 6dlb6e5
331a:1e4:1c8c:f3:39:1:5:587:8:b1d:8de:46:eb:0 db370bf
f568:1:f1c0:f90:867:66:8c3:14:b2:e:1:cfdc:9b2:d58 01a6924
4d50:6c20:098e:87a:666d:f2:ab:48e5:97cd:242f:b607:3f:700:8 2737b09
8:871a:2b:3bf:33:198c:2a:f:9b0:9:12:df:9b17 8745683
17:3:489:c2db:7e56:e8:b33:d3e7:dad:2:a458:46d:23:c 611cd79
a1:23d4:141:2:2:90:a9:2178:c:ba7:b23:d:b:70f 61e8c23
0:6:b69:1:8bc0:b061:24c:dd:b:ab8:73:fd:642:6f e03df5a
0:14:eb:dd:19b:9:b:37:80:88:55:56d8:98c:6 a85b149
6:a304:99:e:78cc:e2a:5c:427:702:e:84:7129:4:19b2 f1ace0c
961:f07:2b1:d4d:f59:6:55c:85bf:b3f9:2:6e56:8:d:5e2 571eeee
23:207:46:5c1c:9:15:599c:02:0b76:798:38a:a3:22:6f1 fec3ad7
53ec:0:0a9b:1739:9:42e:f:76f:9f97:4bad:55:6ed:83:e1e 4e7440f
7:a53:90:cac:9:73:58:a3a:eab:d0a9:eaf0:2abd:6a:ddc 98542ef
0b:0:55a:b7f9:ac:ad:014:c7:6197:b6f:aecd:74:7:9 d1bc8ed
0:5161:5:b8e:5:9a4:6d6f:0:578a:07:a7:552:2aae:e1 996f4bd
c:24:22b4:4763:327b:cb7d:dccl:809:811:b040:767:9b:5df:553f 3e0dcbe
1:8:8e:ce7:63:51e:b7:bb0:f5:8b:b3e3:25ef:746:5 0526bba
ba:2a4:7cce:3e82:5cb:8861:f:9:070:15a:9:5324:9:9e 9dd37dc
7:4eea:039:f33e:866:058:3:54b:eed1:e1d:61:2723:1:3 7afa6f5
bd8:4a2:a85:46:72:050b:caa5:a58:128:b14e:bb73:f:2:c:d f48ceaf
5e3f:7:d:54d9:6471:8:b8:7:e:c1d6:bd2:089c:c85:c6de 5ec6abb
1:41c5:24c3:2edd:8f6:4:44:78aa:423:b13c:21d:e9:b:73aa 11f3643
65:5:f18f:f:5b6:b40:f48:2:64:04:39:7:c7:16e 88f520e
2d:fab:1f5:e4:85:a:b9:b025:94a9:0b:1d53:0ca0:230b:00f 29a901e
33:230:4:c6c:9f:3:4:6:869:0:1:f:152:35 2a00e1e
3:7:f5:3:4704:4df:d8d:b6a:2ca:e9:c0be:c:8ad5:dc 211becc
47d:251c:bff6:1490:37:30:ff2f:02a:43:7:8d:6f:685:675e 115a12b
96d:1:124b5:4:1:79:1:5:ac5:9:694:a:d:cfa3 52ed587
2550:bf8f:ab12:bdfa:c:82:0691:4720:1be:6:1f74:5:03:c a411371
c:57:a065:d5:3895:f:a:b27:396:a7b7:2cd:d9c:a42:dc1 bc30934
15d:5:7115:a0:1d6:e9f:098e:ebb5:3:2e09:176:b0c:b16:fd 47ea9ca
c:fff2b:d38:ce:5eec:a332:cd7:193b:65:3:a:f3:874:7f 4006a9a
3b8e:d1:6:4a6:f2:7c7d:a3ee:b1:6f:25:5ba:e15:1708:13 59b4c91
8621:a949:2:1d9:d16:7cd4:8:0f:9047:7:4:41d8:9:bc bd35534
c0:5818:40:87:0f:d6c:2f83:5d01:cc3:bd:b8:2e4:c73:941c e6846b5
2e:fa37:bdd:1b5:51:d75:b3ca:6218:b:30:4c8:d:e:3bc6 bff3235
b32:8d78:34f:59:d6cb:c9:f5:eac:cf3a:b:6:67b:7:71b 993cad6
b2:d2:721f:0bcc:5a57:7974:a:2:8bf:f:8caf:dba:91:18 eb9e12c
05f:0c4c:1e:c:cd:b3:33:5b:7:1b8:e45:cfcl:fb:2 71624db
f:667:3c:2b1:e96c:820:ce:6:1d:9:090:64:ca56:5dd5 2126a0b
d:0:604:68:5:d353:7:c9:0a95:f4:223:38c:ef:fdc7 a8f3574
d:96:f:9e0a:a7f:7ba:e:530a:96e:a:9:b1f:2a:9e9f 3bb1cef
69c4:e:d:9:33c:2a0:25e6:34:1ac5:14ab:240:9e7:44a:5b0 2370c0a
e1d:86:7:3d45:1beb:6e:032:12f:afac:4f10:94c:7:0:5e2 5f11b10
a8f2:2f3:0e5:593d:adc9:53d8:7bb:8a:4a:0:337:bbd:46b:d5 2ea1c12
cfe6:4d3b:51:13:a3:774:5d2:0:8:2:82:3e47:d331:a8 ac3ac30
e6b7:a819:5:b:0:e:16f:4:d87:39:73:eba:dd:57d fa44dab
97e:920:f1e7:c:93bf:bce8:d89:c7:5cc:64:ef:282d:2d:0 93f70ef
5bec:0:2a7:f:d9:645:127a:e:6:14:542:b:47e:8 aa5bb2a
bc:ca6:c7:cd:c7a8:7cc0:28:8a:25:f:6a:4c85:12:0 8164b53
72a6:b:64:2205:475:9:6a:78b1:e0:ee:4825:6d5c:fb:6ef 543ddd4
4:9:ac4:5:79:85:e:32b:75c5:51b:c2:3d:08b1:8b eb84d7b
93:080:6a:ee:0cf7:00:bb:b:5ee:6:3ab0:ed1:2c:339f 718f7e1
ce2:d:87a3:d:7:24:a:69cb:6:4607:e8c8:8a:c:0 63ca4af
90:05cf:364:27ff:ff14:23d:d86:361:3:25d:17:a9:3:f7 63de9e2
d:92:4da5:7ed7:dcb:e3:d3:c67:0c01:7d8:9:9deb:7541:5 3fdd054
752:568d:58b:13:5:7:72b:0bf5:058:85f:6b36:bb7:del:e9 ccd298b
aa:9:935:4:e034:4702:7:d:906:e:4e1:e8a:7e:f1 cab7fe8
5f:bad1:1:1b:32:16:62a:3e:b6:731:0:7f:d:9 df56613
101

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```