Tokyo Western CTF 2017 PPC Warmup

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This is a warmup coding challenge provided by Tokyo Western CTF 2017:

Palindromes Pairs - Coding Phase -

Problem

```
$ nc ppc1.chal.ctf.westerns.tokyo 8765
```

Flag

	#	Your Score	Score	Your Ratings	Teams
	1	27	27		272

Submit

Flag Submit

Let's run it and see what happens!
(1)

```
mark-VirtualBox ctf # nc ppc1.chal.ctf.westerns.tokyo 8765
###################################
#        Palindromes Pairs        #
###################################

A word is called "palindrome" if it reads the same backward as forward.
For instance, "cbabc", "cbc", "a", "caac" and "deaed" are palindromes.

Given the list of words s_1, s_2, s_3, ..., s_n,
your task is the count pair (i, j) that the concatenation of s_i and s_j is palindrome.


Input Format:
The first line contains n.
The second line contains s_1, s_2, s_3, ..., s_n separated by space.
n
s_1 s_2 s_3 ... s_n

Output Format:
Your program must output the number of pairs in one line.

Conditions:
 * n <= 50
 * |TestCase| = 50
 * Each word only contains lower alphabets.
```

(2)

```
Input Format:
The first line contains n.
The second line contains s_1, s_2, s_3, ..., s_n separated by space.
n
s_1 s_2 s_3 ... s_n

Output Format:
Your program must output the number of pairs in one line.

Conditions:
 * n <= 50
 * |TestCase| = 50
 * Each word only contains lower alphabets.

Example Input 1:
3
a ba cab

Example Output 1:
3

Explanation of Example1:
'aa' (1,1), 'aba' (1,2), 'bacab' (2,3)

Example Input 2:
5
a aa aaa aaaa aaaaa

Example Output 2:
25
```

(3)

```
----- START -----
Input 1/50
32
zx x gy vi ur xf xo yeu frr jop r ul wiq f hfg pq r hal vh ef a vyy f hu fqc gg cop oy pp p a up
```

We are told explicitly what the program needs to do, and also provided with example input and output. Using pwntools and a python script, we can interact with the server. Hopefully, if the number of palindromes is counted correctly and sent to the server for each of the 50 cases, the server will respond with the flag.

Let's look at the script:

```
from pwn import *

#connect to server
r = remote("ppc1.chal.ctf.westerns.tokyo", 8765)

#main loop, run for each case
for x in range(0,50):
    r.recvuntil("/50\n")
    n = r.recvline()              #number of elements
    count = 0                     #number of palindromes
    arr = r.recvline().split()    #store second line
    print arr

    #check if the individual element is a palindrome
    for i in arr:
        if i != len(i) * i[0]:
            if str(i) == str(i)[::-1] and len(i) != 3:
                count += 1

    #check if the pair of elements a palindrome
    for i in arr:
        for j in arr:
            temp = i + j
            if str(temp) == str(temp)[::-1]:
                count += 1

    r.sendline(str(count)) #send palindrome count to server

    #print for debugging information
    print count
    print r.recv()

#print the flag
print r.recv()
```

Now let’s run it:

```
['f', 'hw', 'to', 'ww', 'q', 'qn', 'f', 'st', 'lfn', 'd', 'fd', 'ot', 'ut', 'am'
, 'x', 'x', 'ung', 'y', 'w', 'hj', 'f', 'lh', 'ln', 'y', 'oxu', 'n', 'nll', 'unl
', 'ntt', 'a', 'jts', 'jw', 'q', 'u', 'xyw', 'o', 'qno', 'uf', 'w', 'an', 'j', '
dg', 'nwu', 'hmn', 'jn']
70
Correct!


['aaa', 'aaa', 'aaa', 'aa', 'aaa', 'a']
36
Correct!


['gn', 'ca', 'n', 'os', 'ge', 'o', 'oec', 'cg', 'sg', 'oe', 's', 'egl', 'c', 'ns
', 'goe', 'ccl', 'o', 'o', 'nc', 'c', 'sne', 'a', 'lga', 'ocs', 'oss', 'g', 'ss'
, 'gaa', 'c', 'ls', 'gno', 'ns', 'en', 'ses']
65
Correct!


['qd', 'b', 'q', 'xb', 'di', 'bpl', 'qqi', 'htl', 'qy', 'kb', 's', 'i', 'mbi', '
qi', 'yys', 'bb', 'th', 'i', 'x', 'ht', 'pqx', 's', 'x', 'h', 'hh', 'kx', 'itp',
 'sb', 'by', 'vsm', 'b', 'd', 'ym', 'v', 'dsy', 'dky', 'p', 'x', 'mii', 'p', 'y'
, 'xsk', 'p', 'dvh', 'dpb', 'tqp', 'k', 'hm', 'kvx', 'vmy']
85
Correct!


Congratulations! The Flag is 'TWCTF{find_favorite_smell}'.

[*] Closed connection to ppc1.chal.ctf.westerns.tokyo port 8765
mark-VirtualBox ctf #
```