Q1 Commands
5 Points

List the commands used in the game to reach the first ciphertext.

1. list
2. climb
3. read
4. enter
5. read
6. exit

Q2 Cryptosystem
5 Points

What cryptosystem was used in this level?

Simple substitution cipher

Q3 Analysis
25 Points

What tools and observations were used to figure our the cryptosystem? (Explain in less than 100 words)

1. To decrypt the encrypted text given, we used the frequency analysis method. The most frequent letters are as follows:

c - 13.88%

f - 10.2%

k - 9.8%

o - 9.39%

i - 8.16%

m - 5.31%

g - 5.31%

h - 5.31%

q - 4.9%

The top frequent letters of English alphabets are as follows:

e - 12.02%

t - 9.10%

a - 8.12%

o - 7.68%

i - 7.31%

n - 6.95%

s - 6.28%

r - 6.02%

h - 5.92%

d - 4.32%

2. Since 'c' is the most frequent letter in our ciphertext, we have replaced it with 'e'(the most frequent English letter). Similarly, 'f' letter is replaced with 't'(the second most frequent English letter).

3. We found that 'fi' is the most frequent bigram(12 times) in our cipher, therefore we have replaced it with 'th' (most frequent bigram in English).

4. After these replacements, we found the complete word 'the'. This gave us a hint that spaces are not correctly placed and the letters of the words are not together.

5. We tried replacing the letter 'k' with similar frequent letters in English letters like a, o, i, etc. But all of these replacements didn't make any sense therefore we moved to the next frequent letter which is 'o'.

6. We replaced 'o' with a similar frequent letter 'i'. After this replacement, we found so many occurrences of the word 'thik'. 'thik' word seems to be matching with the word 'this' in the English dictionary. Therefore we replaced 'k' with 's'.

7. Using the same approach we decrypted the whole ciphertext.

8. After decrypting the message, it says "digits are shifted by 2 places". Here, all letters are decrypted, but digits are still in encrypted form.

According to our observation, we found that the encryption formulae used to encrypt digits is:

$E(x) = (x+x)\%10$

In our case $E(x) = 2$

So the only possible values of x are 1 and 6.

So plain text would either be "digits are shifted by 1 places" or "digits are shifted by 6 places". The first sentence is grammatically incorrect("1 places") therefore the only

possible value of x is 6.
So, we shifted back '9' and '1' by 6 places, and we found that
the '6' places shift gave the correct password.
The final password we got is "iRqy3U5qdgt".

Q4 Mapping
10 Points

What is the plaintext space and ciphertext space?
What is the mapping between the elements of plaintext space
and the elements of ciphertext space? (Explain in less than 100
words)

Plaintext space: [a, b, c, d, e, f, g, h, i, l, m, n, o, p, q, r, s, u, v,
y, 6, 3, 5]
Ciphertext space: [a, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, u,
v, x, y, 2, 9, 1]
a - g
b - _
c - e
d - m
e - f
f - t
g - o
h - a
i - h
j - p
k - s
l - w
m - r
n - b
o - i
p - c
q - n
r - y
s - v
t - _
u - l
v - u
w - _
x - q

y - d
z - _
2 - 6
9 - 3
1 - 5

An explanation of this mapping is given in the above answer.

Q5 Password
5 Points

What is the final command used to clear this level?

iRqy3U5qdgt

Q6 Codes
0 Points

Upload any code that you have used to solve this level

📄 No files uploaded

Q7 Team Name
0 Points

Turing

Assignment 1   ● **GRADED**

GROUP

Rohit kushwah
Dinkar Tewari
Deepak Raj
✏ View or edit group

TOTAL POINTS
48 / 50 pts

QUESTION 1
Commands   **5** / 5 pts

QUESTION 2
Cryptosystem   **5** / 5 pts

QUESTION 3
Analysis   **25** / 25 pts

QUESTION 4
Mapping   **8** / 10 pts

QUESTION 5
Password   **5** / 5 pts

QUESTION 6
Codes   **0** / 0 pts

QUESTION 7
Team Name   **0** / 0 pts