Quiz1

Department: **Student ID:** **Name:**

1. Please write a program to find out the frequencies of letters in the ciphertext down below.
2. Use these plaintext frequency count information as a reference to break this encrypted messages.
3. Assume C is Ciphertext, P is Plaintext. Can you find out a particular relationship in between C and P?

4. Suppose f(x) = ax + b (mod 26) where x is plaintext, please solve the value of a and b.

5. What is the size of key space in the 26 letter cipher? Remember, in this quiz, the key of this substitution cipher is defined as a unique replacement of each letter with another one. e.g., A->D, B->M

Ciphertext:

K YZWLNKXKJWGN QUGN ETNMX

MPLMZOMXYM K TMMJOXA XEN

TKZ ZMQEBMF TZEQ KJKZQ EX

KXKJWDOXA KXF MPLJEZM

NHM TJEEF ET XMI CXEIJMFAM IHOYH

MKYH WMKZ RZOXAG IONH ON

Appearance Frequency:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
4	1	1	1	10	4	3	5	4	7	12	3	17	8	7	2	4	1	0	6	1	0	4	12	4	9

Common frequency of letters appearance: (%)

E	A	R	I	O	T	N	S	L	C	U	D	P
11.16	8.5	7.58	7.54	7.16	6.95	6.65	5.74	5.49	4.54	3.63	3.38	3.17

M	H	G	B	F	Y	W	K	V	X	Z	J	Q
3.01	3.0	2.47	2.07	1.81	1.78	1.29	1.10	1.01	0.29	0.27	0.20	0.20

Cipher	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
	1	2	3	4	5	6	7	8	9	10	11	12	13
Plaintext													

N	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
14	15	16	17	18	19	20	21	22	23	24	25	26