Week Four Assignment

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Part 1: Ciphertext (Original Message)

thooztr dzh pxnr ho tzgr gzmqbqi bq x ohyygxq lrmaf xqk yzzn zha zv afr pbqkzp az trr pfrmr dzh xmr.

dzh vbqk dzhm ebrp lyzcnrk ld x oxttbqi amxbq zq afr qrwa amxcn. qzp bv dzh kz qza vrry xqd jxm zv

dzhm cxm xqk cxqqza cxacf tbifa zv afr yxqktcxor lrdzqk afr zafrm amxbq dzh cxqqza aryy pfrafrm

(1) dzhm amxbq bt gzebqi vzmpxmk xqk afr zafrm amxbq bt taxqkbqi tabyy, zm

(2) dzhm amxbq bt taxqkbqi tabyy xqk afr zafrm amxbq bt gzebqi lxcnpxmk, zm

(3) pfrafrm lzaf amxbqt xmr gzebqi bq zooztbar kbmrcabzqt, zm

(4) pfrafrm lzaf amxbqt xmr gzebqi bq afr txgr kbmrcabzq, lha dzhm amxbq vxtarm.

ba bt zlebzht afxa afr amxbqt xmr iraabqi oxta zqr xqzafrm. dzh cxq grxthmr afrbm torrk zv oxmabqi

xt xcchmxaryd xt dzh oyrxtr. lha xyy dzh cxq ormcrber bt afr mryxaber gzabzq zv afr apz amxbqt.

dzh lribq az pzqkrm pfrafrm afrmr bt xqd thcf afbqi xt xltzyhar gzabzq; pfrafrm afrmr bt xqd mrxy

kbvvrmrqcr lraprrq mrta xqk gzabzq. bt afrmr xqd ozttblyr pxd zv aryybqi pfrafrm dzhm amxbq bt bq

gzabzq zm qza bv xyy dzh cxq trr zha zv afr pbqkzp bt tzgr zljrca afxa batryv lr gzebqi?

thooztr afr pbqkzpt prmr xyy chmaxbqrk, fzp czhyk dzh vbqk zha pfrafrm dzh prmr gzebqi vzmpxmk zm

lxcnpxmk zm taxqkbqi tabyy?

* That is my key

Part 2 : Copy and paste your encrypted message into the “Letters frequency analysis tool” window and look at the two bar charts that are generated:

A screenshot of a computer

AI-generated content may be incorrect.

First, let's count letter frequencies in the ciphertext (ignoring spaces/punctuation):

Top frequent cipher letters:

r (45 occurrences), z (38),a(30),b (29),q (28),m (27), p(26),x (25),t (24),d (23)

In English, the most common letters are E, T, A, O, I, N, S, H, R, D. We'll start by mapping the most frequent cipher letters to these.

Step 2: Initial Guesses

Let's make some initial hypotheses:

1.'r' → E (most frequent)

2.'z' → T

3.'f' → A

4.'b' → O

5.'q' → I

6.'m' → N

7.'a' → S

8.’x' → H

9.'t' → D

10.'d' → R

\*We can also use other properties of English: the encrypted letter “x” represents a one letter word, so, it must decrypt to “a”, or “I”. Etc.

Prepare Your Workspace

Plaintext: 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

Ciphertext: ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?

Start Filling the Key

Use the first few words to test hypotheses:

Cipher: t h o o z t r d z h p x n r h o t z g r

Guess: W H A A T H E ? ? ? ? ? ? E A ? ? ? ? E

Step 3 :Alternative Approach: Assume "dzh" = "THE":

d → T, z → H, h → E

Cipher: t h o o z t r d z h p x n r h o t z g r

Guess: ? E ? ? H ? ? T H E ? ? ? ? E ? ? H ? ?

"THE" appears valid. Next, look for "THE" elsewhere to confirm.

Step 4: Guess Short Words

"bq" (2 letters): Likely "OF", "IN", "IT", "IS":

Try b → O, q → F → "OF"

"bq x" → "OF A" (if x → A)

"x" (1 letter): Likely "A" or "I":

x → A