CSC 449 Group Project

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In each language, there are certain letters which occur with more frequency than other letters. In the English language e,t,a are the most frequently occurring letters. We can use the frequency of occurrence of letters to decipher ciphertext assuming that a substitution cipher has been used. We do this by matching the most frequent letters in the ciphertext with the most frequently occurring letters in the English Language

1. Go to the Crypto Corner Website:

https://crypto.interactive-maths.com/frequency-analysis-breaking-the-code.html

2. Paste the ciphertext in the intercept window

3. Find frequencies of the occurrence of each letter

4. Use the frequencies of occurrence of each cipher text letter to determine the mapping of the letters

5. Make substitution

6. Count digraphs/Trigraphs/Count Doubles

7. Redo mapping

8. Make substitutions

9. Repeat until you decipher the code

CipherText

*DJ DK C QLXDWI WF SDGDU PCX. XLRLU KQCSLKBDQK, KJXDHDET FXWZ C BDIILE RCKL, BCGL PWE JBLDX FDXKJ GDSJWXO CTCDEKJ JBL LGDU TCUCSJDS LZQDXL. IYXDET JBL RCJJUL, XLRLU KQDLK ZCECTLI JW KJLCU KLSXLJ QUCEK JW JBL LZQDXL'K YUJDZCJL PLCQWE, JBL ILCJB KJCX, CE CXZWXLI KQCSL KJCJDWE PDJB LEWYTB QWPLX JW ILKJXWO CE LEJDXL QUCELJ. QYXKYLI RO JBL LZQDXL'K KDEDKJLX CTLEJK, QXDESLKK ULDC XCSLK BWZL CRWCXI BLX KJCXKBDQ, SYKJWIDCE WF JBL KJWULE QUCEK JBCJ SCE KCGL BLX QLWQUL CEI XLKJWXL FXLLIWZ JW JBL TCUCVO…*Deliverables

1. The deciphered plaintext

It is a period of civil war. rebel spaceships, striking from a hidden

base, have won their first victory against the evil galactic empire.

during the battle, rebel spies managed to steal secret plans to the

empire's ultimate weapon, the death star, an armored space station with

enough power to destroy an entire planet. pursued by the empire's

sinister agents, princess leia races home aboard her starship,

custodian of the stolen plans that can save her people and restore

freedom to the galaxy

2.   Step by step explanation of how you deciphered the code. Show intermediate steps and screenshots
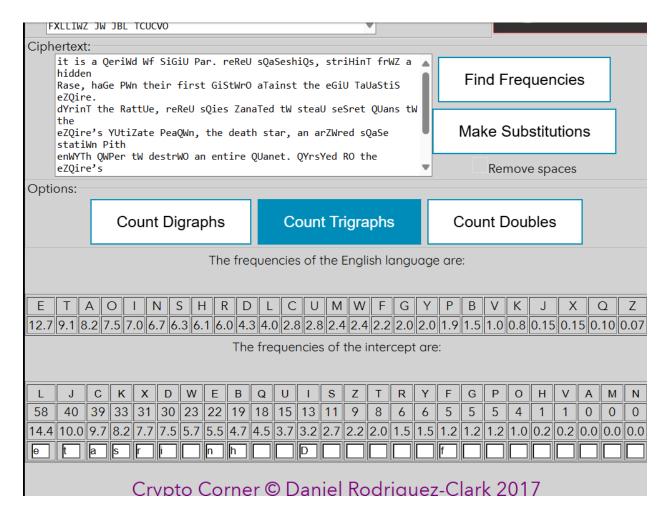
First, we were able to find the words "it" "is" and "a" due them being the most common two letter words and starting with the same letter. Then, we are able to find the word "the" due to being the most common word and e being the most common letter.

Ciphertext:

```
it is a QeXiWI WF SiGiU PaX. XeReU sQaSeshiQs, stXiHiET FXWZ a
hiIIeE
Rase, haGe PWE theiX FiXst GiStWXO aTaiEst the eGiU TaUaStiS
eZQiXe.
IYXiET the RattUe, XeReU sQies ZaEaTeI tW steaU seSXet QUaEs tW
the
eZQiXe's YUtiZate PeaQWE, the Ieath staX, aE aXZWXeI sQaSe
statiWE Pith
eEWYTh QWPeX tW IestXWO aE eEtiXe QUaEet. QYXsYeI RO the
eZQiXe's
```

Find Frequencies

Make Substitutions

☐ Remove spaces

Options:

Count Digraphs   Count Trigraphs   Count Doubles

The frequencies of the English language are:

E	T	A	O	I	N	S	H	R	D	L	C	U	M	W	F	G	Y	P	B	V	K	J	X	Q	Z
12.7	9.1	8.2	7.5	7.0	6.7	6.3	6.1	6.0	4.3	4.0	2.8	2.8	2.4	2.4	2.2	2.0	2.0	1.9	1.5	1.0	0.8	0.15	0.15	0.10	0.07

The frequencies of the intercept are:

L	J	C	K	X	D	W	E	B	Q	U	I	S	Z	T	R	Y	F	G	P	O	H	V	A	M	N
58	40	39	33	31	30	23	22	19	18	15	13	11	9	8	6	6	5	5	5	4	1	1	0	0	0
14.4	10.0	9.7	8.2	7.7	7.5	5.7	5.5	4.7	4.5	3.7	3.2	2.7	2.2	2.0	1.5	1.5	1.2	1.2	1.2	1.0	0.2	0.2	0.0	0.0	0.0
e	t	a	s		i			h																	

We were able to determine that x was r and f was f due to the word "first". The world "entire" realaled that e was n. "Death also revealed the I was d.

Afterward, we were able to determine that this text was about Star Wars due to the term "death star". Now that we had context, it was easier to figure out words. We discover the word "planet" due to q and u being p and l. We were able to piece more words together based on the context of star wars.

Ciphertext:

```
it is a period of ciGil Par. rebel spaceships, strikinT froZ a
hidden
base, haGe Pon their first GictorO aTainst the eGil Talactic
eZpire.
dYrinT the battle, rebel spies ZanaTed to steal secret plans to
the
eZpire's YltiZate Peapon, the death star, an arZored space
station Pith
enoYTh poPer to destroO an entire planet. pYrsYed bO the
eZpire's
```

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e	t	a	s	r	i	o	n	h	p	l	D	c		b		f				k	x				

With most of the words being semi revealed. We were able to fill in the blanks.

```
KJCXKBDQ,
SYKJWIDCE WF JBL KJWULE QUCEK JBCJ SCE KCGL BLX QLWQUL
CEI XLKJWXL
FXLLIWZ JW JBL TCUCVO
```

Reset

Corner

Ciphertext:

```
it is a period of civil war. rebel spaceships, striking from a
hidden
base, have won their first victory against the evil galactic
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during the battle, rebel spies managed to steal secret plans to
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empire's ultimate weapon, the death star, an armored space
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enough power to destroy an entire planet. pursued by the
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```

Find Frequencies

Make Substitutions

☐ Remove spaces

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e	t	a	s	r	i	o	n	h	p	l	d	c	m	g	b	u	f	v	w	y	k	x			

Helpful YouTube Video

https://www.youtube.com/watch?v=mUoQhXWTKE0