Exercises: Breaking Vigenère

1. Here is a text, in blocks of ten letters, sent using the Vigenère cipher.

TVIMRFXLLN	SRXXKPRTXU	KPRJZYJWSV	KCMMGJKCMM	JNBWYTNELC	CMAZTHUBVJ
ROELRXMBVQ	AQRMBGGNXP	VZLRTMKXYG	VYPWHCHOCL	RDIYTBNYMI	EQFNBHXBUO
GAJBBNTJGM	ANTLIGCUMN	VZEUEFVLBB	XLZVFOWYYQ	FHEUESRZLQ	ZBUUNNNIXO
GALXBTXMDI	YRAUELPRHM	VLBTMBVTRZ	MYIJRYBXVP	VSTHUPRYEY	GBBTGIKSAU
PCEOUKPUJA	CKVCRTAUME	EWJOGAYMJG	LZRUBALHFB	XTHQZVTNXQ	FCYJUYNWXK
GCEISKPBFC	EYMCDMOEFL	JLHXLFVGFY	VLVIZGLMYM	BVXHVLGNXZ	IWAZWIFZGU
IOKWHZMBVU	VRDVFBGRXM	EWEZAUKPRC	HOCLFVXHUB	UKGYOBSKPQ	VMXYUYZVTV
KIULRJTHUX	VTVBVLOEAC	JKBALCELHJ	EYPPRIHOCL	AZDHFEGNTN	RBGNBMMMEE
FIDMAZIYFX	YKFYVBVTZC	EARIKYKIYR	HPVZGNXWFC	AZKSNMEKAI	CLVTZOGBUK
BLXTNYLYJI	AJLUPQAMBH	YCFNXXMWVI	XMKWUGKLPX	BZMYIBUKUI	PEUUECMMQ

Using the Kasiski test, give any repetitions of three or more letters that you find, and hence any possible key lengths.

2. The text is 599 letters long. Below is the number of occurrences of each letter in the ciphertext. Calculate the index of coincidence.

	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
occurances	22	36	24	6	27	20	24	20	24	18	25	32	36	22	14	18	10	25	8	23	31	35	13	30	32	24

3. Using the Friedman test, approximate the length of the keyword.

4. If possible, determine the keyword and decrypt the ciphertext (*You may simply name the book*).