1. To design a Hill cipher, remove spaces, comma, period etc. from the message to be encoded and partitioned it into groups of n letters (add extra letters to end if necessary). Assign a number to each letter of the alphabet as given in the table below and each group is formed into a column matrix P.

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
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

The matrix P is then multiplied by an $n \times n$ invertible encryption matrix K and the resulting numbers translated back into letters to create an encrypted message $C = KP$.

The recipient of this encrypted message finds the plaintext $P = K^{-1} C$.

(a) Implement encryption and decryption of the Hill Cipher on variable length (300 or more) plain text and ciphertext. The key could also be of variable length.
(b) Write program to analyze the ciphertext, knowing n^2 plaintext and corresponding n^2 cipher text characters. Use Index of coincidence to check whether assumed key size is correct or not. Assume that key size i.e. n is not too big may be max 10.

Programming language: C/C++ / Python/Matlab.
Deadline: 9th September 2021, 11.59 PM