**CRYPTOGRAPHY**

**CSCI55500 Assignment # 1**

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I tried coding one by one algorithm to text the ciphertexts.

1. Affine decryption

Procedure:

* clean the ciphertext, i.e remove new line, spaces and punctuation
* define Global Variable like FREQ\_ALPHABETS, DIGRAMS, TRIGRAMS, and ALPHABETS. Which are useful in further process.
* I wrote custom functions like Gcd() to calculate GCD of two values
* Function like alphaChar() takes number and returns respective character in ALPHABETS.
* Function like alphaValue() takes character and returns corresponding value in ALPHABETS dictionary.
* Function like modInverse() take integer and returns it’s inverse number in modulo 26
* find the frequencies of each character in ciphertext by using alphabetFreq() function.
* My method to solve is, I had two lists with frequent English alphabets (FREQ\_ALPHABETS) and frequent cipher characters from Input ciphertext (freq).

I took one fixed plain and cipher characters by frequency analysis. “e” is most common character in English. So, we assume most frequent character in cipher text is “e”. so, freq[0] may be “e”. this is first linear equation with unknow a, b.

I will iterate with in “FREQ\_ALPHABETS” list by assigning each character to each and every character in “freq” list to assume possibilities of cipher and plain characters to get second linear equation.

P-sudo code:

For every character in FREQ\_ALPHABETS:

For every character in freq:

m=FREQ\_ALPHABETS[0]

n=FREQ\_ALPHABETS[i+1]

x=freq[0]

y=freq[j+1]

* To solve two linear equations, we wrote sloveEquation() function, which takes m,n,x,y and returns value of a and b.

Here we use alphaValue() function to get values of m,n,x,y respectively.

Two linear equations are:

ma+b = x

na+b = y

by solving above we get, a(m-n) = (x-y)mod26.

To find a, we will use modInverse() function to get inverse of (m-n).

We will get both a and b from fallowing Psudo code.

if(m>n):

val1=modInverse(m-n)

val2=x-y

else:

val1=modInverse(n-m)

val2=y-x

a=(val1\*val2)%26

b=(x-(m\*a))%26

we modulo 26 to get correct value for a and b with in the range of 0 to 25.

* We use Gcd() function to get GCD of a,26 , if this equal to 1. Then there is probability of a and b are true values.
* We decrypt each character in cipher, using below psudo code.

Plain\_val = (modInverse(a)\*(character\_val-b))%26

We use alphaChar() function to get respective character for plain\_val

Got the below intermediate results when ciphertext6.txt is passed.

Enter cipher file name to decrypt:ciphertext6.txt

19 14

1 8

25 16

25 16

23 24

25 16

17 22

25 16

pokemongoisafreetoplaylocationbasedaugmentedrealitygamedevelopedbynianticforiosandandroiddevicesitwasinitiallyreleasedinselectedcountriesinjulytwozeroonesixinthegameplayersuseamobiledevicesgpscapabilitytolocatecapturebattleandtrainvirtualcreaturescalledpokemonwhoappearonthescreenasiftheywereinthesamerealworldlocationastheplayerthegamesupportsinapppurchasesforadditionalingameitemspokemongowasreleasedtomixedreviewswithcriticspraisingthegamesconceptandtheincentivetobemoreactiveintherealworldwhilecriticizingfrequenttechnicalissuesapparentatlaunchdespitesuchreviewsitquicklybecameaglobalphenomenonandwasoneofthemostusedmobileappshavingbeendownloadedbymorethanonehundredandthirtymillionpeopleworldwideitwasalsocreditedwithhelpinglocalbusinessgrowhoweverithasattractedcontroversyforcontributingtoaccidentsandbecomingapublicnuisanceatsomelocationsmultiplegovernmentsexpressedconcernsoverthegamessecuritywithlegislationregardingitbeingpassedinsomecountriesasaresulttheconceptforthegamewasconceivedintwentyfourteenbysatoruiwataofnintendoandtsunekazuishiharaofthepokemoncompanyasanaprilfoolsdaycollaborationwithgooglecalledpokemonchallengeishiharawasafanofdevelopernianticsprevioustransrealitygameingressandsawthegamesconceptasaperfectmatchforthepokemonseriesnianticusedthecrowdsourceddatafromingresstopopulatethelocationsforpokestopsandgymswithinpokemongointwentyfifteenishiharadedicatedhisspeechatthegamesannouncementonseptembertentoiwatawhohaddiedtwomonthsearlierthegamessoundtrackwaswrittenbylongtimepokemonseriescomposerjunichimasudawhoalsoassistedwithsomeofthegamesdesignamongthegamesvisualdesignerswasdennishwangwhopreviouslyworkedatgoogleandcreatedthelogoofgmailonmarchfourthtwentysixteennianticannouncedajapanexclusivebetatestwouldbeginlaterthatmonthallowingplayerstoassistinrefiningthegamebeforeitsfullreleasethebetatestwaslaterexpandedtoothercountriesonaprilsevenitwasannouncedthatthebetawouldexpandtoaustraliaandnewzealandthenonmaysixteenthesignupsforthefieldtestwereopenedtotheunitedstatesthetestcametoanendonjunethirtyatcomiccontwozerosixteenjohnhankefounderofnianticrevealedtheappearancesofthethreeteamleaderscandelateamvalorblancheteammysticandsparkteaminstincthankeconveyedthatapproximatelytenpercentoftheideasforthegamewereimplementedfutureupdatesincludingthemuchanticipatedadditionoftradingmorepokemonimplementationofpokemoncentersatpokestopsapatchforthethreestepglitchandeasiertrainingwerealsoconfirmedhealsostatedthatnianticwouldbecontinuingsupportforthegameforyearstocome

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vkseokzakwcmpreenkvdmqdkimnwkzxmcetmyaoeznetremdwnqamoetejedkvetxqzwmznwipkrwkcmztmztrkwttejwiecwnumcwzwnwmddqredemcetwzcedeinetikyznrwecwzhydqnukberkkzecwfwznleamoevdmqercycemokxwdetejwiecavcimvmxwdwnqnkdkimneimvnyrexmnndemztnrmwzjwrnymdiremnyrecimddetvkseokzulkmvvemrkznlecireezmcwpnlequerewznlecmoeremdukrdtdkimnwkzmcnlevdmqernleamoecyvvkrncwzmvvvyrilmcecpkrmttwnwkzmdwzamoewneocvkseokzakumcredemcetnkowfetrejweucuwnlirwnwicvrmwcwzanleamoecikzievnmztnlewzieznwjenkxeokreminwjewznleremdukrdtulwdeirwnwiwbwzapregyeznneilzwimdwccyecmvvmreznmndmyziltecvwnecyilrejweucwngywisdqxeimoemadkxmdvlezkoezkzmztumckzekpnleokcnycetokxwdemvvclmjwzaxeeztkuzdkmtetxqokrenlmzkzelyztretmztnlwrnqowddwkzvekvdeukrdtuwtewnumcmdckiretwnetuwnlledvwzadkimdxycwzeccarkulkuejerwnlmcmnnrminetikznrkjercqpkrikznrwxynwzankmiiwtezncmztxeikowzamvyxdwizywcmziemnckoedkimnwkzcoydnwvdeakjerzoezncefvreccetikzierzckjernleamoecceiyrwnquwnldeawcdmnwkzreamrtwzawnxewzavmccetwzckoeikyznrwecmcmrecydnnleikzievnpkrnleamoeumcikziewjetwznueznqpkyrneezxqcmnkrywumnmkpzwzneztkmztncyzesmbywclwlmrmkpnlevkseokzikovmzqmcmzmvrwdpkkdctmqikddmxkrmnwkzuwnlakkadeimddetvkseokzilmddezaewclwlmrmumcmpmzkptejedkverzwmznwicvrejwkycnrmzcremdwnqamoewzareccmztcmunleamoecikzievnmcmverpeinomnilpkrnlevkseokzcerweczwmznwiycetnleirkutckyriettmnmprkowzareccnkvkvydmnenledkimnwkzcpkrvksecnkvcmztaqocuwnlwzvkseokzakwznueznqpwpneezwclwlmrmtetwimnetlwccveeilmnnleamoecmzzkyzieoeznkzcevneoxerneznkwumnmulklmttwetnukokznlcemrdwernleamoecckyztnrmisumcurwnnezxqdkzanwoevkseokzcerwecikovkcerhyzwilwomcytmulkmdckmccwcnetuwnlckoekpnleamoectecwazmokzanleamoecjwcymdtecwazercumctezzwclumzaulkvrejwkycdqukrsetmnakkademztiremnetnledkakkpaomwdkzomrilpkyrnlnueznqcwfneezzwmznwimzzkyzietmhmvmzefidycwjexenmnecnukydtxeawzdmnernlmnokznlmddkuwzavdmqercnkmccwcnwzrepwzwzanleamoexepkrewncpyddredemcenlexenmnecnumcdmnerefvmztetnkknlerikyznrweckzmvrwdcejezwnumcmzzkyzietnlmnnlexenmukydtefvmztnkmycnrmdwmmztzeubemdmztnlezkzomqcwfneeznlecwazyvcpkrnlepwedtnecnuerekvezetnknleyzwnetcnmnecnlenecnimoenkmzeztkzhyzenlwrnqmnikowiikznukberkcwfneezhklzlmzsepkyzterkpzwmznwirejemdetnlemvvemrmzieckpnlenlreenemodemtercimztedmnemojmdkrxdmzilenemooqcnwimztcvmrsnemowzcnwzinlmzseikzjeqetnlmnmvvrkfwomnedqnezverieznkpnlewtemcpkrnleamoeuerewovdeoeznetpynyreyvtmnecwzidytwzanleoyilmznwiwvmnetmttwnwkzkpnrmtwzaokrevkseokzwovdeoeznmnwkzkpvkseokzieznercmnvksecnkvcmvmnilpkrnlenlreecnevadwnilmztemcwernrmwzwzaueremdckikzpwroetlemdckcnmnetnlmnzwmznwiukydtxeikznwzywzacyvvkrnpkrnleamoepkrqemrcnkikoe

dwueiwpswgyclreefwdbcobwqcfgwpjcyexcmsiepfexrecbgfosciexetebwdexjopgcpfgqlwrgwycpxcpxrwgxxetgqeygfacygpgfgcbborebecyexgpyebeqfexqwmpfrgeygpnmbofawverwwpeyghgpfzesciedbcoerymyeciwjgbexetgqeysdyqcdcjgbgfofwbwqcfeqcdfmrejcffbecpxfrcgptgrfmcbqrecfmreyqcbbexdwueiwpazwcddecrwpfzeyqreepcyglfzeoaeregpfzeycierecbawrbxbwqcfgwpcyfzedbcoerfzescieymddwrfygpcdddmrqzcyeylwrcxxgfgwpcbgpsciegfeiydwueiwpswacyrebecyexfwighexretgeayagfzqrgfgqydrcgygpsfzescieyqwpqedfcpxfzegpqepfgtefwjeiwrecqfgtegpfzerecbawrbxazgbeqrgfgqgvgpslrekmepffeqzpgqcbgyymeycddcrepfcfbcmpqzxeydgfeymqzretgeaygfkmgqubojeqciecsbwjcbdzepwiepwpcpxacywpewlfzeiwyfmyexiwjgbecddyzctgpsjeepxwapbwcxexjoiwrefzcpwpezmpxrexcpxfzgrfoigbbgwpdewdbeawrbxagxegfacycbywqrexgfexagfzzebdgpsbwqcbjmygpeyysrwazwaetergfzcycffrcqfexqwpfrwteryolwrqwpfrgjmfgpsfwcqqgxepfycpxjeqwigpscdmjbgqpmgycpqecfywiebwqcfgwpyimbfgdbeswterpiepfyehdreyyexqwpqerpywterfzescieyyeqmrgfoagfzbesgybcfgwprescrxgpsgfjegpsdcyyexgpywieqwmpfrgeycycreymbffzeqwpqedflwrfzescieacyqwpqegtexgpfaepfolwmrfeepjoycfwrmgacfcwlpgpfepxwcpxfympeucvmgyzgzcrcwlfzedwueiwpqwidcpocycpcdrgblwwbyxcoqwbbcjwrcfgwpagfzswwsbeqcbbexdwueiwpqzcbbepsegyzgzcrcacyclcpwlxetebwderpgcpfgqydretgwmyfrcpyrecbgfosciegpsreyycpxycafzescieyqwpqedfcycderleqficfqzlwrfzedwueiwpyergeypgcpfgqmyexfzeqrwaxywmrqexxcfclrwigpsreyyfwdwdmbcfefzebwqcfgwpylwrdwueyfwdycpxsoiyagfzgpdwueiwpswgpfaepfolglfeepgyzgzcrcxexgqcfexzgyydeeqzcffzescieycppwmpqeiepfwpyedfeijerfepfwgacfcazwzcxxgexfawiwpfzyecrbgerfzescieyywmpxfrcquacyargffepjobwpsfgiedwueiwpyergeyqwidwyernmpgqzgicymxcazwcbywcyygyfexagfzywiewlfzescieyxeygspciwpsfzescieytgymcbxeygsperyacyxeppgyzacpsazwdretgwmyboawruexcfswwsbecpxqrecfexfzebwswwlsicgbwpicrqzlwmrfzfaepfoyghfeeppgcpfgqcppwmpqexcncdcpehqbmygtejefcfeyfawmbxjesgpbcferfzcfiwpfzcbbwagpsdbcoeryfwcyygyfgprelgpgpsfzesciejelwregfylmbbrebecyefzejefcfeyfacybcferehdcpxexfwwfzerqwmpfrgeywpcdrgbyetepgfacycppwmpqexfzcffzejefcawmbxehdcpxfwcmyfrcbgccpxpeavecbcpxfzepwpicoyghfeepfzeygspmdylwrfzelgebxfeyfaerewdepexfwfzempgfexyfcfeyfzefeyfqciefwcpepxwpnmpefzgrfocfqwigqqwpfawverwyghfeepnwzpzcpuelwmpxerwlpgcpfgqretecbexfzecddecrcpqeywlfzefzreefecibecxeryqcpxebcfecitcbwrjbcpqzefeciioyfgqcpxydcrufecigpyfgpqfzcpueqwpteoexfzcfcddrwhgicfebofepderqepfwlfzegxecylwrfzescieaeregidbeiepfexlmfmremdxcfeygpqbmxgpsfzeimqzcpfgqgdcfexcxxgfgwpwlfrcxgpsiwredwueiwpgidbeiepfcfgwpwldwueiwpqepferycfdwueyfwdycdcfqzlwrfzefzreeyfedsbgfqzcpxecygerfrcgpgpsaerecbywqwplgriexzecbywyfcfexfzcfpgcpfgqawmbxjeqwpfgpmgpsymddwrflwrfzescielwroecryfwqwie

**By observing above results**, we found meaning full text with a=19 and b=14.

pokemongoisafreetoplaylocationbasedaugmentedrealitygamedevelopedbynianticforiosandandroiddevicesitwasinitiallyreleasedinselectedcountriesinjulytwozeroonesixinthegameplayersuseamobiledevicesgpscapabilitytolocatecapturebattleandtrainvirtualcreaturescalledpokemonwhoappearonthescreenasiftheywereinthesamerealworldlocationastheplayerthegamesupportsinapppurchasesforadditionalingameitemspokemongowasreleasedtomixedreviewswithcriticspraisingthegamesconceptandtheincentivetobemoreactiveintherealworldwhilecriticizingfrequenttechnicalissuesapparentatlaunchdespitesuchreviewsitquicklybecameaglobalphenomenonandwasoneofthemostusedmobileappshavingbeendownloadedbymorethanonehundredandthirtymillionpeopleworldwideitwasalsocreditedwithhelpinglocalbusinessgrowhoweverithasattractedcontroversyforcontributingtoaccidentsandbecomingapublicnuisanceatsomelocationsmultiplegovernmentsexpressedconcernsoverthegamessecuritywithlegislationregardingitbeingpassedinsomecountriesasaresulttheconceptforthegamewasconceivedintwentyfourteenbysatoruiwataofnintendoandtsunekazuishiharaofthepokemoncompanyasanaprilfoolsdaycollaborationwithgooglecalledpokemonchallengeishiharawasafanofdevelopernianticsprevioustransrealitygameingressandsawthegamesconceptasaperfectmatchforthepokemonseriesnianticusedthecrowdsourceddatafromingresstopopulatethelocationsforpokestopsandgymswithinpokemongointwentyfifteenishiharadedicatedhisspeechatthegamesannouncementonseptembertentoiwatawhohaddiedtwomonthsearlierthegamessoundtrackwaswrittenbylongtimepokemonseriescomposerjunichimasudawhoalsoassistedwithsomeofthegamesdesignamongthegamesvisualdesignerswasdennishwangwhopreviouslyworkedatgoogleandcreatedthelogoofgmailonmarchfourthtwentysixteennianticannouncedajapanexclusivebetatestwouldbeginlaterthatmonthallowingplayerstoassistinrefiningthegamebeforeitsfullreleasethebetatestwaslaterexpandedtoothercountriesonaprilsevenitwasannouncedthatthebetawouldexpandtoaustraliaandnewzealandthenonmaysixteenthesignupsforthefieldtestwereopenedtotheunitedstatesthetestcametoanendonjunethirtyatcomiccontwozerosixteenjohnhankefounderofnianticrevealedtheappearancesofthethreeteamleaderscandelateamvalorblancheteammysticandsparkteaminstincthankeconveyedthatapproximatelytenpercentoftheideasforthegamewereimplementedfutureupdatesincludingthemuchanticipatedadditionoftradingmorepokemonimplementationofpokemoncentersatpokestopsapatchforthethreestepglitchandeasiertrainingwerealsoconfirmedhealsostatedthatnianticwouldbecontinuingsupportforthegameforyearstocome

I Wrote another program Punctuations.py to keep punctuation in result text using punctuations in ciphertext.

It takes two input, first input is ciphertext. Second input is result we obtained from above decryption.

Gives output text with punctuation.

So, final result of ciphertext6 is as fallows

**Ciphertext 6:**

pokemon go is a free-to-play, location-based augmented reality game developed by niantic for ios and android devices. it was initially released in selected countries

in july two zero one six. in the game, players use a mobile device's gps capability to locate, capture, battle, and train virtual creatures, called pokemon, who appear

on the screen as if they were in the same real world location as the player. the game supports in-app purchases for additional in-game items.

pokemon go was released to mixed reviews, with critics praising the game's concept and the incentive to be more active in the real world, while criticizing frequent technical

issues apparent at launch. despite such reviews, it quickly became a global phenomenon and was one of the most used mobile apps, having been downloaded by more than one hundred

and thirty million people worldwide. it was also credited with helping local business grow. however, it has attracted controversy for contributing to accidents and becoming a

public nuisance at some locations. multiple governments expressed concerns over the game's security, with legislation regarding it being passed in some countries as a result.

the concept for the game was conceived in twenty fourteen by satoru iwata of nintendo and tsunekazu ishihara of the pokemon company as an april fools' day collaboration with google,

called pokemon challenge. ishihara was a fan of developer niantic's previous transreality game, ingress, and saw the game's concept as a perfect match for the pokemon series. niantic

used the crowdsourced data from ingress to populate the locations for pokestops and gyms within pokemon go.in twenty fifteen, ishihara dedicated his speech at the game's announcement

on september ten to iwata, who had died two months earlier. the game's soundtrack was written by longtime pokemon series composer, junichi masuda, who also assisted with some of the game's

design. among the game's visual designers was dennis hwang, who previously worked at google and created the logo of gmail.

on march fourth, twenty sixteen, niantic announced a japan-exclusive beta test would begin later that month, allowing players to assist in refining the game before its full release.

the beta test was later expanded to other countries. on april seven, it was announced that the beta would expand to australia and new zealand. then, on may sixteen, the signups for

the field test were opened to the united states. the test came to an end on june thirty.

at comic con two zero sixteen, john hanke, founder of niantic, revealed the appearances of the three team leaders: candela (team valor), blanche (team mystic), and spark (team instinct).

hanke conveyed that approximately ten percent of the ideas for the game were implemented. future updates, including the much-anticipated addition of trading, more pokemon, implementation of

pokemon centers at pokestops, a patch for the "three step glitch', and easier training, were also confirmed. he also stated that niantic would be continuing support for the game for "years to come".

1. Hill decryption:

Procedure:

* clean the ciphertext, i.e remove new line, spaces and punctuation
* define Global Variable like FREQ\_ALPHABETS, DIGRAMS, TRIGRAMS, and ALPHABETS. Which are useful in further process.
* I wrote custom functions like Gcd() to calculate GCD of two values
* Function like alphaChar() takes number and returns respective character in ALPHABETS.
* Function like alphaValue() takes character and returns corresponding value in ALPHABETS dictionary.
* Function like modInverse() take integer and returns it’s inverse number in modulo 26
* find the frequencies of each character in ciphertext by using alphabetFreq() function.
* Find the di grams and trigrams of cipher text using digram() and trigram() functions.
* To find frequent di grams and trigrams, I wrote diFreq() function.
* To find determinant of matrix, I wrote function detMatrix()
* To find matrix Inverse, I wrote matrixInverse() function which detMatrix() and modInverse() functions.
* matrixModulo() function is used to find matrix madulo 26
* My method to solve is, I found list of frequent diagrams for ciphertext.

I assumed “TH” and “ST” as the common plain texts in my method.

For every element in frequent cipher digram list, I assumed TH as the

Plaintext, for every such iteration I took another frequent digram as “ST”

Psudo-code as fallows:

For every character in freq-digram:

Character(i) is result of TH

For every character in freq-digram:

Character(j) is result of ST

So, we will get two two cipher digrams.

These are used to obtain a key matrix.

Python numpy is used to create 2\*2 matrixs.

mat1=np.matrix([plain1,plain2])

mat2=np.matrix([cipher1,cipher2])

Inverse of mat1 is done by using matrixInverse () function.

We know y=kx, to find key

We will do, K = matrixInverse(x)\*y

For every key matrix, its determinant is used to check if that key is useful or not.

If(GCD(determinant of matrix,26)==1 , then that key is valid for encryption or decryption.

So, by obtaining these keys we will find the Inverse key to decrypt the cipher text.

X=Inverse(key) \* y

**Intermediate results:**

runfile('C:/Users/liebe/Downloads/cryptography/hill.py',wdir='C:/Users/liebe/Downloads/cryptography')

Enter cipher file name to decrypt:ciphertext4.txt

[[ 5 0]

[15 3]]

SV LF

[[21 0]

[25 9]]

zwqnfysittceftormichyoiplelaladtamntkopfifxeqnfuzyzwqnfysittcenayoiplelazwcsstxecpxexiftoraesayagnmtmtstoipsjitujiensitcnuxifgzulnwtdiuixertwtbeoofednieftthqadtamntkaacmrbimdmubbsahaatwobwytniftbetuhkispanmmdxojcssthstqryalivertbeysklfeuamtbehegcqathomwcmutcalthkystxecpxertgsoiveyofttovojsovcrulaeypfauesinarkmryimtanzufajdklgeshcrgbuthaalmdbopokocfxeffqrueolyyulbothsslaxeletestmdthamthwcmutcalgixezazetosiengfgequfabiemthcediuinajiengflemourstmclurewdispeyazdxolhmmanbighnsanrtoraeusvowsgfurmdwbalytqiftbegnxednstwonafapenacspecsenwfqrthwcmuntbeoofednieftgcqugertbeyoiprewdcrkoxboifgdirkmdbothigwlqnmofeieftsgtoiplesiynstmdcsstcrtobimtqryalijajienlythitormichoofednieftantlmdlytethwlfahgwlqncskltezirehubifgthwcmulofevtbrcevetovetohekprewepemizlmdanjmqritpaftaoenazcrozcrswcroibjormdwahyoofednieftzualxifgsitcnuxifgthitormichvaxlgaieftanrtbehrsscdqnjiulvafauewepezawakejmcsuaprssnsxozlswmdiithstrecsnskxvetovetovetolelagnmdgnclydgnyaflqamtzwqnfyoighdtnivtsngnssylxicruajdxoprqakopsthstpewagncnclqavtweftusovqnanbfmuvtufevejydkewfifxeqnthmuuajdmdicstwopslajfwepeulkocuapqnlezajdthklmcqngekoztweftiozethmuuajdxegcbefsaohkgnyarpbitaxegnmtytutwopswepepejoaezaiwklfaztcrthigcvcrxmqnlazligmdthkywepevosaxtwgwlqnpegcjienmtwtbeovqnzwcrklmrkezysgyipsdtbeyoipstxecpbbwtldomssjiiazlsajdgnxednstwonazlktbewagnkplosijienvavtsesiftoraeycenlewnmdthqadtamntshalssovcrulgnxednstwonazlqalefscuqhcsthgssftootbecnytmdmtstssnaboanrtbeyutoheancnwotculrebfqrpeapwcboztbelemourstmcgnmtytutwopsgntuhkkyanxinsklwcxepojfmcgahsgnxednstwonavovganqzstwopsuxhrssgertbeysklfeuayagnmtthwcmuvaiwklxtbecnytmdnajienwswcorytycmutcalfowefezdcddohdqnmutcitbeyoipcfxezdissgpeamqnnscvcrthwpbrcsgnoohamtstamqnrppesileftpeuentuyqihezdwgangcqugertbebewdgfcnytmdmtstssueftdalcomwajdgfsixifgiithyoipplwtxefsanrtbetuhkishgcvcrxmqnvmwdqapeuussdtwtbecnytmdmtstssbouxxrwdytsfitxuzlihgurenatuhkisvcrebigizeziregnthyulixebslaxemtwtoraeeezdwgangcqugemgwlqngfdegnobyhgnrtbeyoipgcfaqmthstgurejdqnseuajdgcqugertbecnytmdmtstssgfpatbqrgnghqm

[[17 3]

[ 1 6]]

SV NM

[[ 4 11]

[21 7]]

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[[ 1 3]

[11 6]]

SV TM

[[20 3]

[11 25]]

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[[15 22]

[25 25]]

SV RN

[[11 8]

[15 17]]

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[[ 3 22]

[13 25]]

SV PN

[[ 9 16]

[13 25]]

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[[23 24]

[ 7 1]]

SV BJ

[[19 12]

[23 21]]

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[[21 3]

[ 5 6]]

SV FM

[[12 7]

[ 3 3]]

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[[ 7 0]

[17 3]]

SV HF

[[15 0]

[19 9]]

twentysixteenturkishcoupdetatattemptsonfifteenjulytwentysixteenacoupdetatwasattemptedinturkeyagainststateinstitutionsincludingbutnotlimitedtothegovernmenttheattemptwascarriedoutbyafactionwithintheturkisharmedforcesthatorganizedthemselvesasthepeaceathomecounciltheyattemptedtoseizecontrolofseveralkeyplacesinankaraistanbulandelsewherebutfailedtodosoafterforcesloyaltothestatedefeatedthemthecouncilcitedanerosionofsecularismtheeliminationofdemocraticruleadisregardforhumanrightsandturkeyslossofcredibilityintheinternationalarenaasreasonsforthecoupthegovernmentaccusedthecoupleadersofbeinglinkedtothegulenmovementagroupdesignatedasaterroristorganizationbytheturkishgovernmentandledbyfethullahgulenaselfexileduringthecoupoverthreezerozeropeoplewerekilledandmorethantwoonezerozerowereinjuredmanygovernmentbuildingsincludingtheturkishparliamentandthepresidentialpalaceweredamagedmassarrestsfollowedwithatleastsixzerozerozerodetainedincludingatleasttwentyeightthirtyninesoldiersandforreasonsthatremainuncleartwentysevenandfourtyfivejudgesfifteenthousandeducationstaffwerealsosuspendedandthelicensesoftwentyonethousandteachersworkingatprivateinstitutionswererevokedaswellafterthegovernmentallegedtheywereloyaltogulenreactionstotheeventwerelargelyagainstthecoupattemptbothdomesticallyandinternationallythemainoppositionpartiesinturkeycondemnedtheattemptwhileseveralinternationalleaderssuchasthosefromtheunitedstatesnatoandtheeuropeanunioncalledforrespectofthedemocraticinstitutionsinturkeyanditselectedofficialsinternationalorganizationsexpressedthemselvesagainstthecoupaswelltheunitednationssecuritycouncilhoweverdidnotdenouncethecoupafterdisagreementsoverthephrasingofastatementpresidentreceptayyiperdoganaccusedtheheadofunitedstatescentralcommandofsidingwithcoupplottersandtheturkishgovernmentmadearequesttotheunitedstatestoextraditefethullahgulenaturkishclericinexileintheunitedstatestoturkeyerdoganaccusesgulenofbeingbehindthecoupaclaimthatgulendeniesandaccusedtheunitedstatesofharboringhim

we find meaning full sentences at key = [[ 7 0] [17 3]] , it’s key inverse is [[15 0][19 9]]

By applying our punctuation function:

**Ciphertext4:**

twenty sixteen turkish coup detat attempts

on fifteen july twenty sixteen, a coup detat was attempted in turkey against state institutions, including, but not limited to the government.

the attempt was carried out by a faction within the turkish armed forces that organized themselves as the peace at home council. they attempted

to seize control of several key places in ankara, istanbul, and elsewhere, but failed to do so after forces loyal to the state defeated them.

the council cited an erosion of secularism, the elimination of democratic rule, a disregard for human rights, and turkey's loss of credibility

in the international arena as reasons for the coup. the government accused the coup leaders of being linked to the gulen movement-a group designated

as a terrorist organization by the turkish government and led by fethullah gulen, a self exile.

during the coup, over three zero zero people were killed and more than two one zero zero were injured. many government buildings, including the turkish

parliament and the presidential palace, were damaged. mass arrests followed, with at least six zero zero zero detained, including at least twenty eight thirty nine

soldiers and, for reasons that remain unclear, twenty seven and fourty five judges. fifteen thousand education staff were also suspended and the licenses of

twenty one thousand teachers working at private institutions were revoked as well after the government alleged they were loyal to gulen.

reactions to the event were largely against the coup attempt, both domestically and internationally. the main opposition parties in turkey condemned the attempt,

while several international leaders-such as those from the united states, nato, and the european union-called for "respect of the democratic institutions

in turkey and its elected officials." international organizations expressed themselves against the coup as well. the united nations security council,

however, did not denounce the coup after disagreements over the phrasing of a statement.

president recep tayyip erdogan accused the head of united states central command of "siding with coup plotters," and the turkish government made a request

to the united states to extradite fethullah gulen (a turkish cleric in exile in the united states) to turkey. erdogan accuses gulen of being behind the coup-a claim

that gulen denies-and accused the united states of harboring him.

1. **Vigenere decryption:**

Procedure:

* clean the ciphertext, i.e remove new line, spaces and punctuation
* define Global Variable like ALPHABETS,englishFreq and alphaBeta. Which are useful in further process.
* I wrote custom functions like Gcd() to calculate GCD of two values
* I wrote nGcd() to calculate GCD for more than two numbers.
* Trigram() to find trigrams in ciphertext
* Function like alphaChar() takes number and returns respective character in ALPHABETS.
* Function like alphaValue() takes character and returns corresponding value in ALPHABETS dictionary.
* Wrote function to calculate IC, takes string and returns IC value.
* Wrote function to do kasiski test on cipher to find possible keys. kasiskiTest()
* Wrote function findMg() to find Mg values of a substring.
* My method to solve is, I found trigrams of a ciphertext. After that selected five most frequent trigrams in obtained result.

For each trigram in the list, passed this trigram and cipher to Kasiski Test.

In KasiskiTest(), it take the value of indexes of repeated trigrams. And calculates GCD on them using nGcd() function. Returns possible m value. i.e Possible sub string.

We will get possible m values in mList().

For each value in mList(), do

- split the ciphertext on m value. We will get y(i),y(i+1)….y(i+m)

- Ex: m= 4. Key = [k1, k2, k3, k4]

- for every possible k(i) and column y(i), do

- find `possible mg values using MgList()

- k(i) = max value of MgList[]

-possible key is obtained for decryption, call decryption() function.

Decryption is done using array of m keys

x= (y(i)-key[i]) modulo 26

alphachar() is used to get relevant character for x.

**Intermediate results:**

Enter cipher file name to decrypt:ciphertext5.txt

10

[3, 8, 13, 13, 4, 17, 5, 17, 4, 4]

howgooglesalphagobeatagoworldchampionalphagoisacomputerprogramdevelopedbygoogledeepmindinlondontoplaytheboardgamegoinoctobertwentyfifteenitbecamethefirstcomputergoprogramtobeataprofessionalhumangoplayerwithouthandicapsonafullsizednineteenbynineteenboardinmarchtwentysixteenitbeatleesedolinafivegamematchthefirsttimeacomputergoprogramhasbeatenaninedanprofessionalwithouthandicapsalthoughitlosttoleesedolinthefourthgameleeresignedthefinalgamegivingafinalscoreoffourgamestooneinfavourofalphagoinrecognitionofbeatingleesedolalphagowasawardedanhonoraryninedanbythekoreabadukassociationalphagosalgorithmusesamontecarlotreesearchtofinditsmovesbasedonknowledgepreviouslylearnedbymachinelearningspecificallybyanartificialneuralnetworkadeeplearningmethodbyextensivetrainingatitscorethegameofgowhichoriginatedinchinamorethantwentyfivehundredyearsagoisanabstractwarsimulationplayersstartwithacompletelyblankboardandplaceblackandwhitestonesoneatatimetosurroundterritoryonceplacedstonesdonotmoveandtheyareremovedonlyiftheyarekilledthatissurroundedcompletelybytheopponentsstonesandsothegamegoesblackstonewhitestoneblackstonewhitestoneuntiltheboardiscoveredinanintricatetapestryofblackandwhitetherulesofgoaresimpleandtakeonlyafewminutestolearnbutthepossibilitiesareseeminglyendlesshoweverthenumberofpotentiallegalboardpositionsisgreaterthanthenumberofatomsintheuniversewhatwelearnedinseoulwithalphagogoisntjustagameitisalivingbreathingcultureofplayersanalystsfansandlegendsoverthelastdaysinseoulsouthkoreawehavebeenluckyenoughtowitnesssomeofthatincredibleexcitementfirsthandwehavealsohadthechancetoseesomethingthatisneverhappenedbeforedeepmindsalphagotookonanddefeatedlegendarygoplayerleesedolninedanprofessionalwitheightenworldtitlesmarkingamajormilestoneforartificialintelligencetoend

we got the above meaningful result, size of m is 10. Their respective key is [3, 8, 13, 13, 4, 17, 5, 17, 4, 4].

By doing punctuation run on above result.

**Ciphertext5:**

how google's alphago beat a go world champion

alphago is a computer program developed by google deepmind in london to play the board game go. in october twenty fifteen, it became the first computer go program to beat a professional human go player without handicaps on a full-sized nineteen by nineteen board. in march twenty sixteen, it beat lee sedol in a five-game match,

the first time a computer go program has beaten a nine-dan professional without handicaps. although it lost to lee sedol in the fourth game, lee resigned the final game, giving a final score of four games to one in favour of alphago. in recognition of

beating lee sedol, alphago was awarded an honorary nine-dan by the korea baduk association.

alphago's algorithm uses a monte carlo tree search to find its moves based on knowledge previously "learned" by machine learning, specifically by an artificial neural network (a deep learning method) by extensive training,

at its core, the game of go, which originated in china more than twenty five hundred years ago, is an abstract war simulation. players start with a completely blank board and place black and white stones, one at a time, to surround territory. once placed,

stones do not move, and they are removed only if they are "killed"-that is, surrounded completely by the opponent's stones. and so the game goes-black stone, white stone, black stone, white stone-until the board is covered in an intricate tapestry of black and white.

the rules of go are simple and take only a few minutes to learn, but the possibilities are seemingly endless. however, the number of potential legal board positions is greater than the number of atoms in the universe.

what we learned in seoul with alphago? go isn't just a game-it is a living, breathing culture of players, analysts, fans, and legends. over the last 10 days in seoul, south korea, we have been lucky enough to witness some of that in credible excitement first hand. we have also had the chance to see something that is never happened before deepminds alphago took on and defeated legendary go player, lee sedol (nine-dan professional with eighten world titles), marking a major milestone for artificial intelligence. to end.

1. **Substitution decryption:**

Procedure:

* clean the ciphertext, i.e remove new line, spaces and punctuation
* define Global Variable like FREQ\_ALPHABETS, DIGRAMS, TRIGRAMS, and ALPHABETS. Which are useful in further process.
* Function like alphaChar() takes number and returns respective character in ALPHABETS.
* Function like alphaValue() takes character and returns corresponding value in ALPHABETS dictionary.
* Function like modInverse() take integer and returns it’s inverse number in modulo 26
* find the frequencies of each character in ciphertext by using alphabetFreq() function.
* Find the di grams and trigrams of cipher text using digram() and trigram() functions.
* To find frequent di grams and trigrams, I wrote diFreq() function.
* I created a object for ciphertext, so changes made to the ciphertext will remain in the object.
* My method to solve is, I found list of frequent characters, digrams and trigrams.

I focused more to get the user input then the computation.

So, every time user gives input, ciphertext modified based on that input and displayed to the user.

**Intermediate results:**

Enter cipher file name to decrypt:ciphertext2.txt

['G', 'Z', 'L', 'T', 'Y', 'A', 'O', 'P', 'S', 'E', 'H', 'J', 'D', 'F', 'X', 'N', 'R', 'V', 'U', 'K', 'C', 'W', 'B', 'Q', 'M']

['ZS', 'AT', 'SG', 'GO', 'YT', 'ZG', 'LT', 'LZ', 'TZ', 'PZ', 'YO', 'TD', 'LE', 'GT', 'TL', 'GP', 'TH', 'YX', 'SL', 'ZY', 'OG', 'RG', 'LP', 'ZA', 'OY', 'GL', 'AD', 'DY', 'YF', 'OA', 'GH', 'VL', 'TY', 'LC', 'SA', 'ZL', 'PA', 'GJ', 'GZ', 'JY', 'AP', 'LO', 'EL', 'PG', 'PY', 'AZ', 'AO', 'XT', 'CG', 'FZ', 'EY', 'EA', 'HL', 'OZ', 'GA', 'AY', 'AJ', 'TP', 'YR', 'DZ', 'KG', 'ZV', 'ZZ', 'PL', 'EE', 'HG', 'HA', 'OL', 'GG', 'GR', 'JG', 'KE', 'CA', 'XO', 'EG', 'EN', 'PP', 'OP', 'OH', 'GE', 'JS', 'VG', 'AE', 'VA', 'TA', 'TG', 'TJ', 'LJ', 'YK', 'DO', 'SY', 'YH', 'UG', 'PS', 'ON', 'GF', 'GU', 'AG', 'LK', 'TT', 'LN', 'YV', 'YJ', 'NP', 'NY', 'FA', 'FY', 'UO', 'UZ', 'ZE', 'PU', 'ZO', 'HZ', 'OU', 'OD', 'GS', 'JA', 'JL', 'JW', 'TV', 'AL', 'TE', 'YU', 'DT', 'YP', 'YZ', 'YY', 'KP', 'DA', 'CL', 'NZ', 'NG', 'NF', 'NL', 'FO', 'FL', 'FG', 'RY', 'ZX', 'UE', 'EV', 'ZN', 'PJ', 'HO', 'HK', 'OR', 'OC', 'GB', 'GC', 'GY', 'RK', 'LR', 'RA', 'JZ', 'LH', 'JP', 'LL', 'QL', 'VY', 'AR', 'TF', 'LW', 'LV', 'DS', 'YG', 'YE', 'OV', 'YA', 'YL', 'KX', 'SN', 'KN', 'KO', 'SZ', 'XZ', 'XA', 'XJ', 'NV', 'NE', 'VS', 'UL', 'US', 'UU', 'UY', 'EP', 'ZP', 'EZ', 'EK', 'ZJ', 'PR', 'HC', 'HY', 'HX', 'OT', 'OX', 'GN', 'RN', 'RP', 'BZ', 'JJ', 'WS', 'TS', 'WG', 'DK', 'TW', 'ZF', 'LA', 'WY', 'TQ', 'G', 'AU', 'VP', 'AK', 'XF', 'AB', 'LU', 'LX', 'YW', 'TM', 'TU', 'TX', 'LD', 'LF', 'DP', 'DJ', 'SO', 'KL', 'TK', 'XU', 'KA', 'XP', 'XR', 'CY', 'XE', 'XD', 'XL', 'XH', 'NU', 'NA', 'NO', 'NK', 'AF', 'FE', 'DL', 'FX', 'FR', 'FP', 'UP', 'UT', 'MG', 'ZU', 'AM', 'ZD', 'EJ', 'EH', 'PO', 'PH', 'PK', 'PF', 'PX', 'PT', 'PV', 'HF', 'HH', 'HJ', 'HU', 'HT', 'HV', 'HQ', 'AH', 'VN', 'OW', 'OF', 'EF', 'GK', 'GD', 'GX', 'WK', 'GV', 'WH', 'RR', 'BA', 'LY', 'WP', 'JN', 'BU', 'ML', 'WA']

['ZSG', 'ATD', 'GTZ', 'TLE', 'ATZ', 'EAD', 'ZLZ', 'AYT', 'GAT', 'TDZ', 'ADY', 'LCG', 'ZAY', 'TZS', 'ZSL', 'GZG', 'LTH', 'LZA', 'SGP', 'AZL', 'YXT', 'ZZS', 'ZGO', 'SGF', 'FZS', 'DZY', 'GOG', 'SLZ', 'YFZ', 'LTL', 'GGT', 'GLO', 'TJG', 'VLP', 'SGO', 'OZS', 'LEE', 'ZGH', 'GJY', 'OAT', 'ZYO', 'YOH', 'OLC', 'LCA', 'RGT', 'HAT', 'PZL', 'PZS', 'GOA', 'JYO', 'YTL', 'APZ', 'LPZ', 'AOU', 'SAO', 'EGP', 'PGO', 'LOZ', 'CAZ', 'NYX', 'JSA', 'DOL', 'LZG', 'TAT', 'OYR', 'KGO', 'SGE', 'DAT', 'LEV', 'ADT', 'YXO', 'ZGG', 'ZGJ', 'GJZ', 'PYX', 'GJS', 'OHA', 'OHG', 'ZYH', 'YON', 'FAO', 'TDY', 'TDO', 'YRG', 'JGR', 'ZOY', 'YKP', 'FOY', 'GSL', 'AEE', 'ZAP', 'ZYT', 'PZG', 'TZA', 'TZZ', 'PAD', 'SLC', 'GOZ', 'GOC', 'AJP', 'FYO', 'ZSA', 'JYT', 'TLP', 'ATH', 'ATA', 'YTP', 'UGO', 'TYZ', 'TYX', 'APP', 'JAG', 'SAT', 'OGL', 'HGZ', 'NZS', 'DYT', 'XTJ', 'LTT', 'LZZ', 'KPG', 'GRG', 'VLC', 'TTY', 'UOY', 'DTL', 'EVL', 'HZS', 'YUG', 'UZS', 'SGL', 'RKG', 'UZG', 'SGZ', 'USN', 'LEY', 'ELT', 'ELJ', 'CGT', 'YXA', 'CGP', 'TEA', 'UEL', 'LRG', 'ZGA', 'ZGR', 'SLT', 'LLT', 'YJW', 'EEN', 'EEL', 'ZLO', 'LKO', 'XAP', 'HKN', 'SGJ', 'ARG', 'YOR', 'LVL', 'YOA', 'YOG', 'PPY', 'HLP', 'WSY', 'LON', 'LOG', 'PLT', 'FZG', 'YRN', 'GRA', 'JLZ', 'OPZ', 'PSA', 'PSL', 'LJW', 'LJJ', 'GEL', 'GEY', 'RGO', 'RGL', 'YEG', 'SYE', 'THL', 'GPA', 'GPG', 'GPL', 'PZO', 'PZP', 'PAL', 'PAJ', 'PAT', 'YLT', 'GFL', 'JPL', 'GOP', 'SLH', 'GOD', 'TGZ', 'UUE', 'KEY', 'KEL', 'CLZ', 'GTP', 'GTL', 'TLT', 'LNF', 'ATP', 'YHL', 'ATE', 'ZEA', 'THA', 'YTD', 'YTG', 'YTF', 'ENL', 'YTY', 'GCG', 'YTZ', 'NLE', 'YZS', 'OCL', 'TYR', 'APA', 'TYV', 'PYT', 'TPZ', 'EYT', 'LPS', 'TPA', 'TPG', 'SAP', 'AOP', 'FGO', 'GPP', 'GHK', 'GHL', 'GHZ', 'OGA', 'OGJ', 'VAE', 'HGH', 'PGU', 'DYP', 'DYY', 'THZ', 'KOA', 'ALT', 'ORY', 'JJY', 'LTY', 'EYX', 'XTV', 'EKG', 'YTH', 'HLN', 'LZV', 'PJA', 'LZY', 'GRK', 'ZVG', 'ZVA', 'NFO', 'ZVL', 'DSZ', 'OXT', 'GUZ', 'SNP', 'OVG', 'DZS', 'NPA', 'VAT', 'JWS', 'XTH', 'AGT', 'OYT', 'GOL', 'KGN', 'KGH', 'NKX', 'KGG', 'YGR', 'HHG', 'VSA', 'EZS', 'VSY', 'EZY', 'HOY', 'LWH', 'SZN', 'PFY', 'ULJ', 'KLK', 'ULT', 'GVG', 'SGG', 'SGC', 'TG', 'SGN', 'JZG', 'SGU', 'EEP', 'SGY', 'AZV', 'LWG', 'HQL', 'ONY', 'AZJ', 'OZX', 'LFZ', 'LEZ', 'GDA', 'OZV', 'LEN', 'XEH', 'LEK', 'LEJ', 'LEG', 'OZE', 'ZFY', 'OZG', 'YGB', 'ELW', 'ELP', 'ADA', 'ELY', 'XOG', 'ELD', 'VGO', 'ADS', 'ELN', 'ONZ', 'YXE', 'YXD', 'YXF', 'ZZG', 'ODO', 'ODL', 'TEY', 'CGY', 'UEG', 'RRG', 'ZZY', 'CGJ', 'ZXU', 'ZUO', 'AJG', 'NEA', 'YJA', 'NEL', 'HFY', 'HTY', 'GOY', 'PYF', 'JSL', 'FPU', 'UPS', 'ZGL', 'ZGU', 'ZGS', 'HXO', 'AJS', 'AJL', 'HXJ', 'PTY', 'AMG', 'EEA', 'EEK', 'FLK', 'FLT', 'YJL', 'LKE', 'LKG', 'ZLE', 'PYR', 'DOX', 'GXO', 'LTG', 'UYW', 'YVN', 'YVL', 'YVA', 'ZPV', 'ZPS', 'YVP', 'HKE', 'HOX', 'LYF', 'RKE', 'EAY', 'VYO', 'VYK', 'NAT', 'OAR', 'OAU', 'SGT', 'OAJ', 'ZYJ', 'ZYL', 'GSY', 'EPY', 'XJA', 'OAD', 'ZYG', 'XFA', 'GYO', 'EYK', 'LUL', 'UTY', 'YOW', 'YOZ', 'TXL', 'YOD', 'OCA', 'EYJ', 'LPU', 'FAF', 'PPX', 'PPZ', 'PSY', 'AOD', 'GAP', 'OWA', 'PPJ', 'SOG', 'LPY', 'PPA', 'GNO', 'HYT', 'LOP', 'GNY', 'HYF', 'HLT', 'YYK', 'PLK', 'TDP', 'PLA', 'YYF', 'TWP', 'PLR', 'PLV', 'TDK', 'ODY', 'WAT', 'YRP', 'JZY', 'JZA', 'FZV', 'YRK', 'TVA', 'XRR', 'OLZ', 'OLT', 'TVL', 'TVS', 'RAT', 'OLH', 'TML', 'VGT', 'FGP', 'AEN', 'RNU', 'OAZ', 'OPL', 'NVA', 'OPA', 'OPG', 'OPY', 'JLR', 'NVS', 'JLT', 'RNK', 'VGS', 'GKA', 'JGZ', 'JGY', 'YKL', 'LJG', 'JGA', 'DYF', 'YKE', 'EFZ', 'ZOA', 'VGL', 'BUG', 'LDY', 'GEF', 'XDS', 'GEA', 'HOV', 'LEP', 'TPH', 'RGH', 'GBU', 'RGA', 'AEZ', 'RGZ', 'EGL', 'GBA', 'RGS', 'RGR', 'JGH', 'LXH', 'ZAR', 'HJN', 'SYU', 'SYV', 'ZAZ', 'PHX', 'ENV', 'SYO', 'ZAE', 'EGJ', 'GPS', 'GPR', 'THF', 'THG', 'GPZ', 'ZXT', 'THK', 'PXR', 'THO', 'ZXO', 'GPF', 'THV', 'GHC', 'LEA', 'THY', 'OFG', 'HAL', 'GPO', 'KNL', 'TZN', 'VNY', 'OAM', 'FEY', 'PZE', 'XJL', 'TZG', 'TZE', 'TZY', 'TZV', 'PZY', 'EPZ', 'PAB', 'GHA', 'YAJ', 'TQL', 'HUO', 'OAG', 'OTU', 'GFA', 'WKX', 'JPY', 'OTG', 'GFY', 'GFX', 'GOV', 'GOT', 'SLO', 'GOF', 'MLE', 'GOH', 'GTK', 'AJY', 'EJL', 'POA', 'RPL', 'RPJ', 'FYX', 'CYA', 'TGB', 'GYK', 'GBZ', 'TGU', 'GYF', 'AZZ', 'ZSO', 'JYF', 'JYX', 'JYP', 'QLU', 'QLT', 'ZJY', 'OUU', 'ZEN', 'TUS', 'KEG', 'HVL', 'KEN', 'TLL', 'FRY', 'CLT', 'ODA', 'TLX', 'GTJ', 'YAT', 'GTH', 'GTD', 'LNG', 'LPP', 'ZEG', 'XOH', 'NUO', 'LNP', 'PVY', 'WPZ', 'YXJ', 'ATQ', 'ATT', 'WYF', 'ATV', 'YHG', 'ATL', 'CGE', 'YHO', 'ATG', 'GZV', 'KXZ', 'CGA', 'GZA', 'MGH', 'HGO', 'GZL', 'GZN', 'YTA', 'YTE', 'AFZ', 'YTM', 'YTS', 'DLK', 'ENE', 'FLE', 'UGP', 'PKE', 'SZD', 'YPU', 'ZJS', 'YZX', 'UGL', 'TKG', 'FXZ', 'YOL', 'NGH', 'NGL', 'NGB', 'YPR', 'XLO', 'PYO', 'PYJ', 'UYA', 'YHX', 'KAE', 'LPG', 'EYV', 'LPL', 'PRA', 'LPT', 'JAT', 'EYF', 'KGD', 'AOR', 'XZA', 'XZX', 'RAJ', 'TZO', 'RAE', 'PRG', 'SAJ', 'GHO', 'GPU', 'ZNV', 'DKG', 'GHY', 'PGJ', 'ZNF', 'ZNG', 'ONA', 'XUZ', 'GHT', 'GPY', 'OGC', 'OGG', 'KNZ', 'OGS', 'OGP', 'TFA', 'OGV', 'TFG', 'OGT', 'EHG', 'THJ', 'HGC', 'ABZ', 'XOA', 'THQ', 'YFG', 'KXP', 'XOY', 'YPZ', 'YFE', 'XOP', 'XOT', 'VPJ', 'DYG', 'ONP', 'YFR', 'YFP', 'DYL', 'ONE', 'YFO', 'LRP', 'PGE', 'PGG', 'CAO', 'HAK', 'CAT', 'DPY', 'HAJ', 'BAP', 'XHA', 'ORG', 'PUY', 'PUG', 'PUO', 'ALL', 'PUL', 'LTJ', 'LTD', 'AUU', 'XTZ', 'LTX', 'LTW', 'LTS', 'OUT', 'GGK', 'OUP', 'OUZ', 'GGX', 'WHL', 'JSG', 'GLW', 'AKE', 'ENZ', 'GLT', 'GLR', 'GLP', 'GLZ', 'GCY', 'BZG', 'GLE', 'GLJ', 'LZE', 'HLJ', 'PJY', 'LZJ', 'NOG', 'HLV', 'HLZ', 'HCL', 'TZU', 'WGP', 'HCA', 'ZVY', 'NFA', 'TTA', 'PLE', 'VLE', 'ENG', 'VLN', 'G', 'PZF', 'BZO', 'GUY', 'UOG', 'ZDO', 'GUS', 'DYO', 'TSG', 'GUE', 'TSL', 'AGZ', 'NPY', 'WGO', 'VGA', 'AHL', 'JNY', 'NPK', 'LAH', 'HZY', 'LHU', 'XPZ', 'VAZ', 'LHH', 'NLF', 'DJY', 'TDJ', 'LHC', 'YWG', 'YYU', 'OYU', 'TAZ', 'OYY', 'OYF', 'OYH', 'OYJ', 'OYK', 'JWK', 'AGE', 'RYF', 'RYO', 'RYH', 'YFL', 'JWY']

['LZAY', 'GJSA', 'ZSGF', 'EYXA', 'AYTL', 'GOCL', 'ZGJZ', 'LCAZ', 'GOAT', 'TLEV', 'NPAJ', 'DZYT', 'ATDZ', 'YTYR', 'EADY', 'LCGP', 'ZAPZ', 'ZYON', 'SLZZ', 'GJYO', 'EYTD', 'TYXT', 'TYZS', 'LOZS', 'JGRG', 'PLTH', 'LTHZ', 'PALT', 'LPZO', 'AZLZ', 'DOLC', 'OUPS', 'OYRP', 'APZG', 'GEFZ', 'LEEL', 'YTPZ', 'LEEN', 'SZNG', 'DJYP', 'GBUG', 'KXPZ', 'DYTG', 'ATAZ', 'LNGH', 'OYRG', 'GHAT', 'GRGT', 'NLEP', 'YFOY', 'GTDO', 'ELYF', 'LVLE', 'ATGZ', 'ELWH', 'LENV', 'EYJW', 'GOGL', 'AEEP', 'WSYE', 'NFAF', 'AEEK', 'GPLE', 'TZAP', 'NUOY', 'AOPZ', 'EEAY', 'TEAD', 'ZGUS', 'YHOV', 'ODYY', 'EJLR', 'LPPY', 'FLKO', 'UYAT', 'FGPP', 'GGTP', 'LTLX', 'TFGO', 'VNYX', 'EKGO', 'PYXD', 'LHHG', 'YXTH', 'HXJA', 'ATEA', 'ZUOG', 'GOLT', 'SGPG', 'YOZE', 'GZAR', 'ZLON', 'G', 'LZVL', 'GGKA', 'ABZG', 'LZVG', 'RGRA', 'ZLOZ', 'AJYF', 'OARG', 'EZYH', 'ELDY', 'TATT', 'OUTY', 'YXOP', 'GZGO', 'OXTV', 'JLTS', 'ORYF', 'UGOL', 'KGOZ', 'GHCA', 'GOHG', 'GXOY', 'ZGHY', 'TLEY', 'GELP', 'ZGAT', 'TMLE', 'PYTS', 'ELTG', 'ZPSL', 'KGGT', 'LULT', 'HAJL', 'XTHY', 'LLTH', 'YORY', 'LNPK', 'LTLT', 'NLFZ', 'GLPZ', 'HJNY', 'ZGOF', 'CGJY', 'TZVA', 'GZNV', 'FZVY', 'PGGT', 'JAGT', 'YJLZ', 'GLZE', 'GHZS', 'XTZA', 'OTUS', 'GOGC', 'PXRR', 'SGPY', 'KOAG', 'FYXO', 'GOVG', 'PZSG', 'HLNF', 'GOYR', 'EVLC', 'YODL', 'VGTZ', 'GLJJ', 'RYHG', 'TZYO', 'TDZS', 'ZZSO', 'PYJA', 'PTYZ', 'VLNF', 'RAEN', 'SAPP', 'ZSGO', 'ZSGN', 'VLPS', 'LZZS', 'GTZE', 'NZSG', 'NKXZ', 'YOLH', 'ZSGY', 'PSAT', 'FZSG', 'ZSGU', 'TZSG', 'TZOY', 'JZAY', 'RGSL', 'SLCG', 'QLTX', 'PPJY', 'YVAT', 'RGHZ', 'PJAG', 'AHLJ', 'GPGU', 'SGTH', 'ZGHK', 'JWYF', 'SGPL', 'FYON', 'LTHQ', 'GATA', 'UGLT', 'LOPL', 'JSAO', 'JSLO', 'OUUE', 'LRPL', 'JGYF', 'PUGO', 'SGZV', 'ADYP', 'ADYO', 'PZGA', 'ADAT', 'SYVL', 'PULJ', 'GATZ', 'TFAO', 'ZGRK', 'SGZG', 'GVGO', 'CLTJ', 'AZJY', 'HATD', 'GYKP', 'RAJP', 'ZOAT', 'GCYA', 'DYPZ', 'VSAJ', 'JYTH', 'TDZY', 'YXTJ', 'EYKP', 'GDAT', 'LEZS', 'THKE', 'OTGB', 'HAKE', 'ODAT', 'PUOY', 'UZSL', 'LPLK', 'SLHU', 'HGHL', 'PZYG', 'YLTT', 'SLTW', 'OATD', 'KELJ', 'KLKE', 'OGAT', 'UGPF', 'SGFY', 'CGAT', 'HTYV', 'UZGR', 'GNYX', 'LZGS', 'AZVL', 'EGPA', 'GTJG', 'PADT', 'GLOZ', 'TPHX', 'GAPP', 'OYYF', 'XEHG', 'ADTL', 'LONZ', 'SZDO', 'WATD', 'EGPZ', 'JWSY', 'YTZS', 'XZXO', 'ENGB', 'ATPG', 'TPAT', 'ZZGO', 'YKPG', 'RKEL', 'OCAT', 'XUZS', 'TZZS', 'HKNL', 'UYWG', 'GOZS', 'GPAD', 'DOXT', 'ATVL', 'TZZY', 'OAUU', 'YFZS', 'THAL', 'OGSY', 'ZGGT', 'LPZL', 'OAMG', 'OGLE', 'ZSAP', 'GHOY', 'GPRG', 'GEAD', 'XFAO', 'LWGO', 'JYOH', 'PVYO', 'YOHA', 'CGTK', 'HGZG', 'PYTA']

['SG', 'GO', 'ZG', 'GT', 'GP', 'OG', 'RG', 'GL', 'GH', 'GJ', 'GZ', 'PG', 'GA', 'CG', 'KG', 'GG', 'GR', 'HG', 'JG', 'GE', 'EG', 'UG', 'GF', 'GU', 'TG', 'VG', 'AG', 'GS', 'GB', 'GC', 'GY', 'NG', 'FG', 'GN', 'YG', 'WG', 'MG', 'GK', 'GD', 'GX', 'GV', 'G']

['ZSG', 'GTZ', 'GAT', 'LCG', 'GZG', 'GOG', 'SGF', 'SGP', 'GGT', 'ZGO', 'GLO', 'TJG', 'PGO', 'GOA', 'SGO', 'GJY', 'LZG', 'ZGH', 'RGT', 'EGP', 'KGO', 'GOZ', 'GOC', 'HGZ', 'SGE', 'OGL', 'YRG', 'ZGG', 'GJZ', 'ZGJ', 'JGR', 'KPG', 'GRG', 'UGO', 'GJS', 'JAG', 'PZG', 'OHG', 'YUG', 'GSL', 'OGA', 'TGZ', 'GOP', 'HGH', 'GOD', 'YOG', 'GFL', 'GOL', 'SGL', 'PGU', 'SGZ', 'LOG', 'GPL', 'CGT', 'LRG', 'FZG', 'GTP', 'GTL', 'RKG', 'CGP', 'YTG', 'EKG', 'ARG', 'GRK', 'ZGA', 'ZVG', 'ZGR', 'GCG', 'GEL', 'GEY', 'RGO', 'RGL', 'GUZ', 'SGJ', 'OVG', 'OGJ', 'YEG', 'GPP', 'GPA', 'GPG', 'TPG', 'FGO', 'GRA', 'GHK', 'AGT', 'GHL', 'GHZ', 'UZG', 'KGN', 'GFA', 'OGG', 'KGH', 'KGG', 'YGR', 'HHG', 'OTG', 'OGS', 'OGP', 'TGU', 'TFG', 'OGT', 'YGB', 'GFY', 'GFX', 'AJG', 'GOV', 'GOT', 'GOY', 'PGE', 'HGO', 'GVG', 'GOF', 'GYF', 'SGG', 'DYG', 'SGC', 'TG', 'SGN', 'OAG', 'GTH', 'TGB', 'LWG', 'SGT', 'GYK', 'GYO', 'SOG', 'PGG', 'SGY', 'GNO', 'YWG', 'GNY', 'NOG', 'KGD', 'ORG', 'GAP', 'GBZ', 'GDA', 'ZEG', 'YFG', 'PUG', 'KEG', 'LEG', 'OZG', 'OGC', 'LTG', 'XOG', 'GTK', 'GTJ', 'JZG', 'GTD', 'GGK', 'LNG', 'ZZG', 'TSG', 'CGY', 'HGC', 'GGX', 'CGE', 'UEG', 'RRG', 'OGV', 'GUE', 'CGJ', 'GLW', 'GLT', 'GLR', 'GLP', 'GLZ', 'VGT', 'BZG', 'YHG', 'GLJ', 'ATG', 'GZV', 'OPG', 'GZA', 'MGH', 'JGY', 'GZL', 'GZN', 'VGS', 'GKA', 'WGP', 'ZGL', 'JSG', 'JGZ', 'VGA', 'LJG', 'ZGU', 'ZGS', 'JGA', 'ENG', 'VGO', 'VGL', 'BUG', 'UGP', 'GEF', 'GEA', 'CGA', 'AMG', 'UGL', 'G', 'GHO', 'TKG', 'GUY', 'RGH', 'UOG', 'GBU', 'RGA', 'GUS', 'NGH', 'EGL', 'RGZ', 'LKG', 'NGL', 'GBA', 'NGB', 'RGS', 'RGR', 'JGH', 'GHA', 'GOH', 'WGO', 'GCY', 'GXO', 'EGJ', 'GPS', 'GPR', 'LPG', 'GPZ', 'GPY', 'EHG', 'GLE', 'GPF', 'GHC', 'OFG', 'GPO', 'THG', 'TZG', 'FGP', 'PRG', 'GPU', 'AGZ', 'PGJ', 'DKG', 'GHY', 'AGE', 'SGU', 'GSY', 'ZNG', 'ZYG', 'GHT']

['GJSA', 'ZSGF', 'GOAT', 'LCGP', 'GOCL', 'ZGJZ', 'GJYO', 'JGRG', 'EKGO', 'GEFZ', 'SZNG', 'GBUG', 'UGOL', 'OGAT', 'LNGH', 'OYRG', 'GRGT', 'JAGT', 'GOGC', 'ATGZ', 'GOGL', 'GOVG', 'GPLE', 'ZGGT', 'ZGUS', 'GGTP', 'TFGO', 'APZG', 'LHHG', 'ZUOG', 'GOLT', 'SGPG', 'GZAR', 'ZSGY', 'ABZG', 'LZVG', 'RGRA', 'PZSG', 'DYTG', 'OARG', 'GHCA', 'ZGHK', 'GZGO', 'GHAT', 'KGOZ', 'GXOY', 'ZGHY', 'GELP', 'ZGAT', 'OGSY', 'HGZG', 'KGGT', 'SGPL', 'ZGOF', 'CGJY', 'GZNV', 'PGGT', 'GTDO', 'GLZE', 'GHZS', 'SGPY', 'KOAG', 'GCYA', 'GOYR', 'VGTZ', 'GLJJ', 'RYHG', 'ENGB', 'ZSGO', 'ZSGN', 'HGHL', 'FZSG', 'ZSGU', 'TZSG', 'SLCG', 'ZGRK', 'RGHZ', 'PJAG', 'SGTH', 'GNYX', 'CGTK', 'GATA', 'UGLT', 'JGYF', 'SGZV', 'RGSL', 'PZGA', 'GATZ', 'G', 'SGZG', 'GVGO', 'GYKP', 'GOHG', 'GPGU', 'GDAT', 'OTGB', 'ELTG', 'PZYG', 'PUGO', 'UGPF', 'SGFY', 'CGAT', 'LZGS', 'EGPA', 'GTJG', 'GLOZ', 'GAPP', 'GLPZ', 'XEHG', 'NZSG', 'EGPZ', 'ATPG', 'ZZGO', 'YKPG', 'UZGR', 'GGKA', 'UYWG', 'GOZS', 'GPAD', 'FGPP', 'OAMG', 'OGLE', 'GHOY', 'GPRG', 'GEAD', 'LWGO', 'GTZE']

Suggest char of A:

It will ask suggestions for all alphabets, based on frequent characters and digrams. We will suggest the possible character for the ALPHABETS.

We observed G as most frequest, so d(G) = e

We observe most frequent digram is “ZSG”, we will assume that as “THE”

So, d(G)=e, d(Z)=t,d(S)=h

We know second most frequent trigram is, “ING”. We got ATD as second most frequent cipher digram.

So, d(A)=i, d(T)=n, d(G)=g

Give these observations to the program

suggest char ofA:i

suggest char ofC:

suggest char ofB:

suggest char ofE:

suggest char ofD:g

suggest char ofG:e

suggest char ofF:

suggest char ofI:

suggest char ofH:

suggest char ofK:

suggest char ofJ:

suggest char ofM:

suggest char ofL:

suggest char ofO:

suggest char ofN:

suggest char ofQ:

suggest char ofP:

suggest char ofS:h

suggest char ofR:

suggest char ofU:

suggest char ofT:n

suggest char ofW:

suggest char ofV:

suggest char ofY:

suggest char ofX:

suggest char ofZ:t

{'A': 'i', 'C': 0, 'B': 0, 'E': 0, 'D': 'g', 'G': 'e', 'F': 0, 'I': 0, 'H': 0, 'K': 0, 'J': 0, 'M': 0, 'L': 0, 'O': 0, 'N': 0, 'Q': 0, 'P': 0, 'S': 'h', 'R': 0, 'U': 0, 'T': 'n', 'W': 0, 'V': 0, 'Y': 0, 'X': 0, 'Z': 't'}

JhiOU! thLt iP the PYXnH YF the EYng-PYXght gOLCitLtiYnLE VLCeP, OiUUEeP in the FLKOiJ YF PULJetiRe,LJJYOHing tY Ln LnnYXnJeRent tYHLN FOYR PJientiPtP VYOWing Yn the ELPeO inteOFeOYReteO gOLCitLtiYnLEVLCe YKPeOCLtYON (EigY) eBUeOiRent.YOiginLEEN theYOiMeH KN LEKeOt einPtein in nineteen PiBteen, gOLCitLtiYnLE VLCeP hLCe EYng Keen Peen LPL KeHOYJW YF RYHeOn UhNPiJP LnH LPtOYnYRN, KXt it VLP nYt XntiE tYHLN'P KEYJWKXPteO LnnYXnJeRent thLt VehLH UOYYF theN OeLEEN eBiPteH. nYV PJientiPtP hLCe JYnFiOReH thLt the tVin EigY PtLtiYnP in EYXiPiLnL LnHVLPhingtYn PtLte hLH HeteJteH the PignLE YF tVY KELJW hYEeP ReOging Yne UYint thOee KiEEiYn Eight NeLOP LVLNFOYR eLOth in PeUteRKeO tVentN FiFteen, LnH thLt thiP PignLE JLRe in the FYOR YF Ln LXHiKEe "JhiOU."nYV NYX JLn heLO the PLRe RinH-KEYVing JYPRiJ PYXnH FYO NYXOPeEF thLnWP tY eRiEN ELWHLVLEEL YF the UELnetLONPYJietN, VhY VLP Yn hLnH tY JLtJh L OeJYOHing YF the "JhiOU" UELNeH Lt the EigY LnnYXnJeRent UOePP JYnFeOenJein VLPhingtYn, H.J. NYX FiOPt heLO the CYiJe YF EYXiPiLnL PtLte UhNPiJP LnH LPtOYnYRN UOYFePPYO gLKOieEL gYnMLEeP,L EigY PUYWePUeOPYn, intOYHXJing the JhiOU.PhYOtEN LFteO the PeUteRKeO eCent, EigY OeJYOHeH LnYtheO, VeLWeO PignLE thLt VLP UOYKLKEN LEPY FOYR KELJW hYEeP, the teLR PLiH. LJJYOHing tY HO. VeiPP, theOe VeOe Lt EeLPt FYXO HeteJtiYnP HXOing the FiOPt EigY YKPeOCing OXn, VhiJh enHeH in QLnXLON. the PeJYnH OXn ViEE Kegin thiP PXRReO. in the FLEE, LnYtheO HeteJtYO, LHCLnJeH CiOgY, YUeOLteH KN the eXOYUeLn gOLCitLtiYnLE YKPeOCLtYON in itLEN, ViEE PtLOt XU. theOe LOe hYUeP FYO RYOe in the FXtXOe, in inHiL LnH QLULn. LP PYRe hLCe inHiJLteH Yn tVitteO, it JYXEH eCen Ke NYXO neBt OingtYne.

key board intrept to stop:

keyboard intrept to stop program

I observed thiP , so guessing d(P)=s.

suggest char ofC:

suggest char ofB:

suggest char ofE:

suggest char ofF:

suggest char ofI:

suggest char ofH:

suggest char ofK:

suggest char ofJ:

suggest char ofM:

suggest char ofL:

suggest char ofO:

suggest char ofN:

suggest char ofQ:

suggest char ofP:s

suggest char ofR:

suggest char ofU:

suggest char ofW:

suggest char ofV:

suggest char ofY:

suggest char ofX:

{'A': 'i', 'C': 0, 'B': 0, 'E': 0, 'D': 'g', 'G': 'e', 'F': 0, 'I': 0, 'H': 0, 'K': 0, 'J': 0, 'M': 0, 'L': 0, 'O': 0, 'N': 0, 'Q': 0, 'P': 's', 'S': 'h', 'R': 0, 'U': 0, 'T': 'n', 'W': 0, 'V': 0, 'Y': 0, 'X': 0, 'Z': 't'}

JhiOU! thLt is the sYXnH YF the EYng-sYXght gOLCitLtiYnLE VLCes, OiUUEes in the FLKOiJ YF sULJetiRe,LJJYOHing tY Ln LnnYXnJeRent tYHLN FOYR sJientists VYOWing Yn the ELseO inteOFeOYReteO gOLCitLtiYnLEVLCe YKseOCLtYON (EigY) eBUeOiRent.YOiginLEEN theYOiMeH KN LEKeOt einstein in nineteen siBteen, gOLCitLtiYnLE VLCes hLCe EYng Keen seen LsL KeHOYJW YF RYHeOn UhNsiJs LnH LstOYnYRN, KXt it VLs nYt XntiE tYHLN's KEYJWKXsteO LnnYXnJeRent thLt VehLH UOYYF theN OeLEEN eBisteH. nYV sJientists hLCe JYnFiOReH thLt the tVin EigY stLtiYns in EYXisiLnL LnHVLshingtYn stLte hLH HeteJteH the signLE YF tVY KELJW hYEes ReOging Yne UYint thOee KiEEiYn Eight NeLOs LVLNFOYR eLOth in seUteRKeO tVentN FiFteen, LnH thLt this signLE JLRe in the FYOR YF Ln LXHiKEe "JhiOU."nYV NYX JLn heLO the sLRe RinH-KEYVing JYsRiJ sYXnH FYO NYXOseEF thLnWs tY eRiEN ELWHLVLEEL YF the UELnetLONsYJietN, VhY VLs Yn hLnH tY JLtJh L OeJYOHing YF the "JhiOU" UELNeH Lt the EigY LnnYXnJeRent UOess JYnFeOenJein VLshingtYn, H.J. NYX FiOst heLO the CYiJe YF EYXisiLnL stLte UhNsiJs LnH LstOYnYRN UOYFessYO gLKOieEL gYnMLEes,L EigY sUYWesUeOsYn, intOYHXJing the JhiOU.shYOtEN LFteO the seUteRKeO eCent, EigY OeJYOHeH LnYtheO, VeLWeO signLE thLt VLs UOYKLKEN LEsY FOYR KELJW hYEes, the teLR sLiH. LJJYOHing tY HO. Veiss, theOe VeOe Lt EeLst FYXO HeteJtiYns HXOing the FiOst EigY YKseOCing OXn, VhiJh enHeH in QLnXLON. the seJYnH OXn ViEE Kegin this sXRReO. in the FLEE, LnYtheO HeteJtYO, LHCLnJeH CiOgY, YUeOLteH KN the eXOYUeLn gOLCitLtiYnLE YKseOCLtYON in itLEN, ViEE stLOt XU. theOe LOe hYUes FYO RYOe in the FXtXOe, in inHiL LnH QLULn. Ls sYRe hLCe inHiJLteH Yn tVitteO, it JYXEH eCen Ke NYXO neBt OingtYne.

key board intrept to stop:

I observed siBteen, that is sixteen, sJientists that is scientists

d(B)=x , d(J)=c

suggest char ofC:

suggest char ofB:x

suggest char ofE:

suggest char ofF:

suggest char ofI:

suggest char ofH:

suggest char ofK:

suggest char ofJ:c

suggest char ofM:

suggest char ofL:

suggest char ofO:

suggest char ofN:

suggest char ofQ:

suggest char ofR:

suggest char ofU:

suggest char ofW:

suggest char ofV:

suggest char ofY:

suggest char ofX:

{'A': 'i', 'C': 0, 'B': 'x', 'E': 0, 'D': 'g', 'G': 'e', 'F': 0, 'I': 0, 'H': 0, 'K': 0, 'J': 'c', 'M': 0, 'L': 0, 'O': 0, 'N': 0, 'Q': 0, 'P': 's', 'S': 'h', 'R': 0, 'U': 0, 'T': 'n', 'W': 0, 'V': 0, 'Y': 0, 'X': 0, 'Z': 't'}

chiOU! thLt is the sYXnH YF the EYng-sYXght gOLCitLtiYnLE VLCes, OiUUEes in the FLKOic YF sULcetiRe,LccYOHing tY Ln LnnYXnceRent tYHLN FOYR scientists VYOWing Yn the ELseO inteOFeOYReteO gOLCitLtiYnLEVLCe YKseOCLtYON (EigY) exUeOiRent.YOiginLEEN theYOiMeH KN LEKeOt einstein in nineteen sixteen, gOLCitLtiYnLE VLCes hLCe EYng Keen seen LsL KeHOYcW YF RYHeOn UhNsics LnH LstOYnYRN, KXt it VLs nYt XntiE tYHLN's KEYcWKXsteO LnnYXnceRent thLt VehLH UOYYF theN OeLEEN existeH. nYV scientists hLCe cYnFiOReH thLt the tVin EigY stLtiYns in EYXisiLnL LnHVLshingtYn stLte hLH HetecteH the signLE YF tVY KELcW hYEes ReOging Yne UYint thOee KiEEiYn Eight NeLOs LVLNFOYR eLOth in seUteRKeO tVentN FiFteen, LnH thLt this signLE cLRe in the FYOR YF Ln LXHiKEe "chiOU."nYV NYX cLn heLO the sLRe RinH-KEYVing cYsRic sYXnH FYO NYXOseEF thLnWs tY eRiEN ELWHLVLEEL YF the UELnetLONsYcietN, VhY VLs Yn hLnH tY cLtch L OecYOHing YF the "chiOU" UELNeH Lt the EigY LnnYXnceRent UOess cYnFeOencein VLshingtYn, H.c. NYX FiOst heLO the CYice YF EYXisiLnL stLte UhNsics LnH LstOYnYRN UOYFessYO gLKOieEL gYnMLEes,L EigY sUYWesUeOsYn, intOYHXcing the chiOU.shYOtEN LFteO the seUteRKeO eCent, EigY OecYOHeH LnYtheO, VeLWeO signLE thLt VLs UOYKLKEN LEsY FOYR KELcW hYEes, the teLR sLiH. LccYOHing tY HO. Veiss, theOe VeOe Lt EeLst FYXO HetectiYns HXOing the FiOst EigY YKseOCing OXn, Vhich enHeH in QLnXLON. the secYnH OXn ViEE Kegin this sXRReO. in the FLEE, LnYtheO HetectYO, LHCLnceH CiOgY, YUeOLteH KN the eXOYUeLn gOLCitLtiYnLE YKseOCLtYON in itLEN, ViEE stLOt XU. theOe LOe hYUes FYO RYOe in the FXtXOe, in inHiL LnH QLULn. Ls sYRe hLCe inHicLteH Yn tVitteO, it cYXEH eCen Ke NYXO next OingtYne.

key board intrept to stop:

we observed existeH, existed. d(H)=d thLt, so d(L)=a

suggest char ofC:

suggest char ofE:

suggest char ofF:

suggest char ofI:

suggest char ofH:d

suggest char ofK:

suggest char ofM:

suggest char ofL:a

suggest char ofO:

suggest char ofN:

suggest char ofQ:

suggest char ofR:

suggest char ofU:

suggest char ofW:

suggest char ofV:

suggest char ofY:

suggest char ofX:

{'A': 'i', 'C': 0, 'B': 'x', 'E': 0, 'D': 'g', 'G': 'e', 'F': 0, 'I': 0, 'H': 'd', 'K': 0, 'J': 'c', 'M': 0, 'L': 'a', 'O': 0, 'N': 0, 'Q': 0, 'P': 's', 'S': 'h', 'R': 0, 'U': 0, 'T': 'n', 'W': 0, 'V': 0, 'Y': 0, 'X': 0, 'Z': 't'}

chiOU! that is the sYXnd YF the EYng-sYXght gOaCitatiYnaE VaCes, OiUUEes in the FaKOic YF sUacetiRe,accYOding tY an annYXnceRent tYdaN FOYR scientists VYOWing Yn the EaseO inteOFeOYReteO gOaCitatiYnaEVaCe YKseOCatYON (EigY) exUeOiRent.YOiginaEEN theYOiMed KN aEKeOt einstein in nineteen sixteen, gOaCitatiYnaE VaCes haCe EYng Keen seen asa KedOYcW YF RYdeOn UhNsics and astOYnYRN, KXt it Vas nYt XntiE tYdaN's KEYcWKXsteO annYXnceRent that Vehad UOYYF theN OeaEEN existed. nYV scientists haCe cYnFiORed that the tVin EigY statiYns in EYXisiana andVashingtYn state had detected the signaE YF tVY KEacW hYEes ReOging Yne UYint thOee KiEEiYn Eight NeaOs aVaNFOYR eaOth in seUteRKeO tVentN FiFteen, and that this signaE caRe in the FYOR YF an aXdiKEe "chiOU."nYV NYX can heaO the saRe Rind-KEYVing cYsRic sYXnd FYO NYXOseEF thanWs tY eRiEN EaWdaVaEEa YF the UEanetaONsYcietN, VhY Vas Yn hand tY catch a OecYOding YF the "chiOU" UEaNed at the EigY annYXnceRent UOess cYnFeOencein VashingtYn, d.c. NYX FiOst heaO the CYice YF EYXisiana state UhNsics and astOYnYRN UOYFessYO gaKOieEa gYnMaEes,a EigY sUYWesUeOsYn, intOYdXcing the chiOU.shYOtEN aFteO the seUteRKeO eCent, EigY OecYOded anYtheO, VeaWeO signaE that Vas UOYKaKEN aEsY FOYR KEacW hYEes, the teaR said. accYOding tY dO. Veiss, theOe VeOe at Eeast FYXO detectiYns dXOing the FiOst EigY YKseOCing OXn, Vhich ended in QanXaON. the secYnd OXn ViEE Kegin this sXRReO. in the FaEE, anYtheO detectYO, adCanced CiOgY, YUeOated KN the eXOYUean gOaCitatiYnaE YKseOCatYON in itaEN, ViEE staOt XU. theOe aOe hYUes FYO RYOe in the FXtXOe, in india and QaUan. as sYRe haCe indicated Yn tVitteO, it cYXEd eCen Ke NYXO next OingtYne.

key board intrept to stop:

we observed accYOding, according so, d(Y)=o , d(O)=r

suggest char ofC:

suggest char ofE:

suggest char ofF:

suggest char ofI:

suggest char ofK:

suggest char ofM:

suggest char ofO:r

suggest char ofN:

suggest char ofQ:

suggest char ofR:

suggest char ofU:

suggest char ofW:

suggest char ofV:

suggest char ofY:o

suggest char ofX:

{'A': 'i', 'C': 0, 'B': 'x', 'E': 0, 'D': 'g', 'G': 'e', 'F': 0, 'I': 0, 'H': 'd', 'K': 0, 'J': 'c', 'M': 0, 'L': 'a', 'O': 'r', 'N': 0, 'Q': 0, 'P': 's', 'S': 'h', 'R': 0, 'U': 0, 'T': 'n', 'W': 0, 'V': 0, 'Y': 'o', 'X': 0, 'Z': 't'}

chirU! that is the soXnd oF the Eong-soXght graCitationaE VaCes, riUUEes in the FaKric oF sUacetiRe,according to an annoXnceRent todaN FroR scientists VorWing on the Easer interFeroReter graCitationaEVaCe oKserCatorN (Eigo) exUeriRent.originaEEN theoriMed KN aEKert einstein in nineteen sixteen, graCitationaE VaCes haCe Eong Keen seen asa KedrocW oF Rodern UhNsics and astronoRN, KXt it Vas not XntiE todaN's KEocWKXster annoXnceRent that Vehad UrooF theN reaEEN existed. noV scientists haCe conFirRed that the tVin Eigo stations in EoXisiana andVashington state had detected the signaE oF tVo KEacW hoEes Rerging one Uoint three KiEEion Eight Nears aVaNFroR earth in seUteRKer tVentN FiFteen, and that this signaE caRe in the ForR oF an aXdiKEe "chirU."noV NoX can hear the saRe Rind-KEoVing cosRic soXnd For NoXrseEF thanWs to eRiEN EaWdaVaEEa oF the UEanetarNsocietN, Vho Vas on hand to catch a recording oF the "chirU" UEaNed at the Eigo annoXnceRent Uress conFerencein Vashington, d.c. NoX First hear the Coice oF EoXisiana state UhNsics and astronoRN UroFessor gaKrieEa gonMaEes,a Eigo sUoWesUerson, introdXcing the chirU.shortEN aFter the seUteRKer eCent, Eigo recorded another, VeaWer signaE that Vas UroKaKEN aEso FroR KEacW hoEes, the teaR said. according to dr. Veiss, there Vere at Eeast FoXr detections dXring the First Eigo oKserCing rXn, Vhich ended in QanXarN. the second rXn ViEE Kegin this sXRRer. in the FaEE, another detector, adCanced Cirgo, oUerated KN the eXroUean graCitationaE oKserCatorN in itaEN, ViEE start XU. there are hoUes For Rore in the FXtXre, in india and QaUan. as soRe haCe indicated on tVitter, it coXEd eCen Ke NoXr next ringtone.

key board intrept to stop:

we observed annoXnceRent , announcement. So d(X)=u, d(R)=m

tVitter, twitter, d(V)=w

conFerence , d(F)=f

suggest char ofC:

suggest char ofE:

suggest char ofF:f

suggest char ofI:

suggest char ofK:

suggest char ofM:

suggest char ofN:

suggest char ofQ:

suggest char ofR:m

suggest char ofU:

suggest char ofW:

suggest char ofV:w

suggest char ofX:u

{'A': 'i', 'C': 0, 'B': 'x', 'E': 0, 'D': 'g', 'G': 'e', 'F': 'f', 'I': 0, 'H': 'd', 'K': 0, 'J': 'c', 'M': 0, 'L': 'a', 'O': 'r', 'N': 0, 'Q': 0, 'P': 's', 'S': 'h', 'R': 'm', 'U': 0, 'T': 'n', 'W': 0, 'V': 'w', 'Y': 'o', 'X': 'u', 'Z': 't'}

chirU! that is the sound of the Eong-sought graCitationaE waCes, riUUEes in the faKric of sUacetime,according to an announcement todaN from scientists worWing on the Easer interferometer graCitationaEwaCe oKserCatorN (Eigo) exUeriment.originaEEN theoriMed KN aEKert einstein in nineteen sixteen, graCitationaE waCes haCe Eong Keen seen asa KedrocW of modern UhNsics and astronomN, Kut it was not untiE todaN's KEocWKuster announcement that wehad Uroof theN reaEEN existed. now scientists haCe confirmed that the twin Eigo stations in Eouisiana andwashington state had detected the signaE of two KEacW hoEes merging one Uoint three KiEEion Eight Nears awaNfrom earth in seUtemKer twentN fifteen, and that this signaE came in the form of an audiKEe "chirU."now Nou can hear the same mind-KEowing cosmic sound for NourseEf thanWs to emiEN EaWdawaEEa of the UEanetarNsocietN, who was on hand to catch a recording of the "chirU" UEaNed at the Eigo announcement Uress conferencein washington, d.c. Nou first hear the Coice of Eouisiana state UhNsics and astronomN Urofessor gaKrieEa gonMaEes,a Eigo sUoWesUerson, introducing the chirU.shortEN after the seUtemKer eCent, Eigo recorded another, weaWer signaE that was UroKaKEN aEso from KEacW hoEes, the team said. according to dr. weiss, there were at Eeast four detections during the first Eigo oKserCing run, which ended in QanuarN. the second run wiEE Kegin this summer. in the faEE, another detector, adCanced Cirgo, oUerated KN the euroUean graCitationaE oKserCatorN in itaEN, wiEE start uU. there are hoUes for more in the future, in india and QaUan. as some haCe indicated on twitter, it couEd eCen Ke Nour next ringtone.

key board intrept to stop:

we observed Urofessor, as professor , d(U)=p

UhNsics, phycics. d(N)=y

aEso, also , d(E)=l

suggest char ofC:

suggest char ofE:l

suggest char ofI:

suggest char ofK:

suggest char ofM:

suggest char ofN:y

suggest char ofQ:

suggest char ofU:p

suggest char ofW:

{'A': 'i', 'C': 0, 'B': 'x', 'E': 'l', 'D': 'g', 'G': 'e', 'F': 'f', 'I': 0, 'H': 'd', 'K': 0, 'J': 'c', 'M': 0, 'L': 'a', 'O': 'r', 'N': 'y', 'Q': 0, 'P': 's', 'S': 'h', 'R': 'm', 'U': 'p', 'T': 'n', 'W': 0, 'V': 'w', 'Y': 'o', 'X': 'u', 'Z': 't'}

chirp! that is the sound of the long-sought graCitational waCes, ripples in the faKric of spacetime,according to an announcement today from scientists worWing on the laser interferometer graCitationalwaCe oKserCatory (ligo) experiment.originally theoriMed Ky alKert einstein in nineteen sixteen, graCitational waCes haCe long Keen seen asa KedrocW of modern physics and astronomy, Kut it was not until today's KlocWKuster announcement that wehad proof they really existed. now scientists haCe confirmed that the twin ligo stations in louisiana andwashington state had detected the signal of two KlacW holes merging one point three Killion light years awayfrom earth in septemKer twenty fifteen, and that this signal came in the form of an audiKle "chirp."now you can hear the same mind-Klowing cosmic sound for yourself thanWs to emily laWdawalla of the planetarysociety, who was on hand to catch a recording of the "chirp" played at the ligo announcement press conferencein washington, d.c. you first hear the Coice of louisiana state physics and astronomy professor gaKriela gonMales,a ligo spoWesperson, introducing the chirp.shortly after the septemKer eCent, ligo recorded another, weaWer signal that was proKaKly also from KlacW holes, the team said. according to dr. weiss, there were at least four detections during the first ligo oKserCing run, which ended in Qanuary. the second run will Kegin this summer. in the fall, another detector, adCanced Cirgo, operated Ky the european graCitational oKserCatory in italy, will start up. there are hopes for more in the future, in india and Qapan. as some haCe indicated on twitter, it could eCen Ke your next ringtone.

key board intrept to stop:

we observed Qapan, d(Q)=j

haCe , have d(C)=v

faKric, fabric d(K)=b

{'A': 'i', 'C': 'v', 'B': 'x', 'E': 'l', 'D': 'g', 'G': 'e', 'F': 'f', 'I': 0, 'H': 'd', 'K': 'b', 'J': 'c', 'M': 0, 'L': 'a', 'O': 'r', 'N': 'y', 'Q': 'j', 'P': 's', 'S': 'h', 'R': 'm', 'U': 'p', 'T': 'n', 'W': 0, 'V': 'w', 'Y': 'o', 'X': 'u', 'Z': 't'}

chirp! that is the sound of the long-sought gravitational waves, ripples in the fabric of spacetime,according to an announcement today from scientists worWing on the laser interferometer gravitationalwave observatory (ligo) experiment.originally theoriMed by albert einstein in nineteen sixteen, gravitational waves have long been seen asa bedrocW of modern physics and astronomy, but it was not until today's blocWbuster announcement that wehad proof they really existed. now scientists have confirmed that the twin ligo stations in louisiana andwashington state had detected the signal of two blacW holes merging one point three billion light years awayfrom earth in september twenty fifteen, and that this signal came in the form of an audible "chirp."now you can hear the same mind-blowing cosmic sound for yourself thanWs to emily laWdawalla of the planetarysociety, who was on hand to catch a recording of the "chirp" played at the ligo announcement press conferencein washington, d.c. you first hear the voice of louisiana state physics and astronomy professor gabriela gonMales,a ligo spoWesperson, introducing the chirp.shortly after the september event, ligo recorded another, weaWer signal that was probably also from blacW holes, the team said. according to dr. weiss, there were at least four detections during the first ligo observing run, which ended in january. the second run will begin this summer. in the fall, another detector, advanced virgo, operated by the european gravitational observatory in italy, will start up. there are hopes for more in the future, in india and japan. as some have indicated on twitter, it could even be your next ringtone.

key board intrept to stop:

we observed worWing, working d(W)=k

theoriMed, theorized , d(M)=z

key board intrept to stop:

suggest char ofI:

suggest char ofM:z

{'A': 'i', 'C': 'v', 'B': 'x', 'E': 'l', 'D': 'g', 'G': 'e', 'F': 'f', 'I': 0, 'H': 'd', 'K': 'b', 'J': 'c', 'M': 'z', 'L': 'a', 'O': 'r', 'N': 'y', 'Q': 'j', 'P': 's', 'S': 'h', 'R': 'm', 'U': 'p', 'T': 'n', 'W': 'k', 'V': 'w', 'Y': 'o', 'X': 'u', 'Z': 't'}

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key board intrept to stop:

we are not seeing any capital letters so, our assumptions are right.

**Ciphertext2:**

chirp! that is the sound of the long-sought gravitational waves, ripples in the fabric of spacetime,according to an announcement today from scientists working on the laser interferometer gravitationalwave observatory (ligo) experiment.

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now you can hear the same mind-blowing cosmic sound for yourself thanks to emily lakdawalla of the planetarysociety, who was on hand to catch a recording of the "chirp" played at the ligo announcement press conferencein washington, d.c. you first hear the voice of louisiana state physics and astronomy professor gabriela gonzales,a ligo spokesperson, introducing the chirp.

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as some have indicated on twitter, it could even be your next ringtone.

1. Permutation decryption:

Procedure:

* clean the ciphertext, i.e remove new line, spaces and punctuation
* define Global Variable like ALPHABETS,englishFreq and alphaBeta. Which are useful in further process.
* I wrote custom functions like Gcd() to calculate GCD of two values
* I wrote nGcd() to calculate GCD for more than two numbers.
* Trigram() to find trigrams in ciphertext
* Function like alphaChar() takes number and returns respective character in ALPHABETS.
* Function like alphaValue() takes character and returns corresponding value in ALPHABETS dictionary.
* Tested each and every possible length for key and for each key, tested each and every combination

Finally got some result after lot of iterations.

theenigmamaciinesweweaeeriesoselcctromemhaiicalrororiiphermrchnnesdeveloeedandudednntheeaelyoomidtwtnteethceneurttoprotoctoommercraliiplomamicnndmililarccommunucaiioneninmaaasinvevtebbythegermnnenginierrrthursrhebbiusatahenndofwowldaaroneeerlmmodelsleruusedcocmecciallylrottheearaynnneteenewettiesanaadpptedbybilttaryanagoeernmenesevvicesosseeeralcocntiiesmosonoaablynanigrrmanybyfoeeanddudinwworldwdrtoosevereldfffereneenggmamodolseereprorucddbutthtgemmanmilitayymodeleartthemosocommonlyryconnisedhdweeerjapapesaanditatiammodelslavbbeenusudgrrmanmimitrrymesssgeeenciphpreoontheeeigaamachihewrrefirsrbrkkenbytyepllishcichebbureauaegnnningigdeeembernrneeeenthihtywwothisiuceesswasareuultofeffottsbythteeoolishchypaanalysysmrrianrerewkkijerzrroyyckianaherrykzygylsiiworkikgfrrpolisimiiitaryiytelligencnreeewskirivesseengigeeeedthedevieeusingnherreticacmahhematitsaddmaterealuupplieibyrrenchmhliaaryintnllggencesebsqquentltthtthreemethmmaticicnseesignenmehhanicacdeiicesfofbraakingegigaaciphehsiccludinithccryptotogccbombfbomiineteeethrrtyeigitowwardsasdiiionalclmpeexitywysrppeatedeyaddedtotoeeiigmamamhieesmakikgdccryptitnmrredifffcuttandreruiiingfuruheeequipmpntnndpersrnnllmoreteanhhepolelcolldreadalyrroducecnteentysisanttwentytevnnjulynyneeeenthihtyiineinpnryeearwaraawhhepolelinttiatederecchandbditsshmililariintelllgeccereprpsettativevinootheirinimmadecrcptoontechciqeesandeduimmentiniluiingzygylsiisheeteantthecryrtooogicbobbaddpromimedaachdelegaiionapopisrreconsnruttedeninmahhedemomstaationrnprssentedeviaalbasisfotthelatarbiitishchntnnuatioianeeffortrurnngthewerbiitishchypoologisisdccryptetavsstnumbmrommessagaseccipheredoeenigmamlatturingnashhecentnaloorceinirekkingthtenggmathehntllligeneegeeanedfdomhhissouoceoodenamaduttrabytyebiitishwhsauubstanaiaaaidtotoealliedwawefoortthohghnnigmahadsmmecrypyogaaphicwcakeessesisprccticeiewaggermanaroeeduralalassoperaroriistakekfalluretotyseematicilliintrodocehhangesenecciphereenpprocedereaandallledaapturerfkyytablelanhhardwawetaatdurirgteewareneblddallieicrpptologostttosucccednndturnrdteetideiethaallieseavrrtheene

after doing punctuation to it:

the enigma maciines wewe a eeries os elcctro-memhaiical roror iipher mrchnnes develoeed and uded nn the eaely-oo mid-twtnteeth ceneurt to protoct oommercral,

iiplomamic nnd mililarc communucaiion. eninma aas invevteb by the germnn enginier rrthur srhebbius at ahe nnd of wowld aar one. eerlm models leru used cocmeccially

lrot the earay nnneteen ewetties, ana adppted by bilttary ana goeernmene sevvices os seeeral cocntiies, moso noaably nani grrmany byfoee and dudinw world wdr too.

severel dffferene enggma modols eere prorucdd, but tht gemman militayy modele art the moso commonly ryconnised. hdweeer, japapesa and itatiam models lavb been usud.

grrman mimitrry messsgee enciphpreo on the eeigaa machihe wrre firsr brkken by tye pllish cicheb bureau,aegnnning ig deeember nrneeeen thihty wwo. this iuceess was

a reuult of effotts by thtee oolish chypaanalysys, mrrian rerewkki, jerzr royycki ana herryk zygylsii, workikg frr polisi miiitary iytelligencn. reeewski

rivesse-engigeeeed the deviee, using nherreticac mahhematits add matereal uuppliei by rrench mhliaary intnllggence. sebsqquentlt, tht three methmmaticicns eesignen

mehhanicac deiices fof braaking egigaa ciphehs, iccludini thc cryptotogcc bomb. fbom iineteee thrrty eigit owwards, asdiiional clmpeexity wys rppeatedey added to

toe eiigma mamhiees, makikg dccryptitn mrre difffcutt and reruiiing furuhee equipmpnt nnd persrnnll-more tean hhe polel colld readaly rroduce.

cn teenty sis ant twenty tevnn july nyneeeen thihty iine,in pnry eear waraaw, hhe polel inttiated erecch and bditssh mililari intelllgecce reprpsettativev inoo their

inimma-decrcptoon techciqees and eduimment, iniluiing zygylsii sheete ant the cryrtooogic bobb, add promimed aach delegaiion a popisr-reconsnrutted eninma. hhe demomstaation

rnprssented e viaal basis fot the latar biitish chntnnuatioi ane effort. rurnng the wer, biitish chypoologisis dccryptet a vsst numbmr om messagas ecciphered oe enigma.

mlat turing nas hhe centnal oorce in irekking tht enggma. the hntllligenee geeaned fdom hhis souoce, oodenamad "uttra" by tye biitish, whs a uubstanaiaa aid to toe allied waw efoort.

thohgh nnigma had smme crypyogaaphic wcakeesses, is prcctice ie wag german aroeedural alass, operaror iistakek, fallure to tyseematicilli introdoce hhanges en ecciphereenp

procederea, and allled aapture rf kyy tablel anh hardwawe taat, durirg tee war, enebldd alliei crpptologostt to succced nnd "turnrd tee tide" ie tha allies' eavrr. the ene.

After guessing some words:

the enigma machines were a series of electro-mechanical cipher machines developed and added in the early mid twenteeth century to protect commerical,diplomatic and military communication. enigma the invention by the german engineer --- at the end of world war one. early models were used comercially.

in the early ninteen twentties and adopted by milatry and government services of several contries, most notably nazi germany forces in world war too.

severl differet enigma models were produced, but the german military models art the most commonly coinsied between japanese and italian models that been used.

german military messages encrypted on the enigma machine were first broken by the polish cipher buero engineering in december nineteen thirty. ww2. this success was a result of efforts by three polish chryptoanalysts, ---,---,--- working for polsih milatry intelligence, rewski rivsse - engineered the device, using -- matematics and matirial supoplied by the french milatry intelligence, subsequently the three matahmaticians designed mechanical devices for breaking enigma ciphers, including the cryptology bomb.from ni8nteen thirty eighty onwards, additional complexity repeatedly added to the enigma machines, making decryption more difficult and furture equipment and more than the readly produce.

in twenty six and twenty twelve july nighnteen thirty in warsaw

toe eiigma mamhiees, makikg dccryptitn mrre difffcutt and reruiiing furuhee equipmpnt nnd persrnnll-more tean hhe polel colld readaly rroduce.

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**Final decryption of Ciphertext1:**

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inimma-decrcptoon techciqees and eduimment, iniluiing zygylsii sheete ant the cryrtooogic bobb, add promimed aach delegaiion a popisr-reconsnrutted eninma. hhe demomstaation

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Able to find Ciphetext1 is solved by permutation cipher decryption.