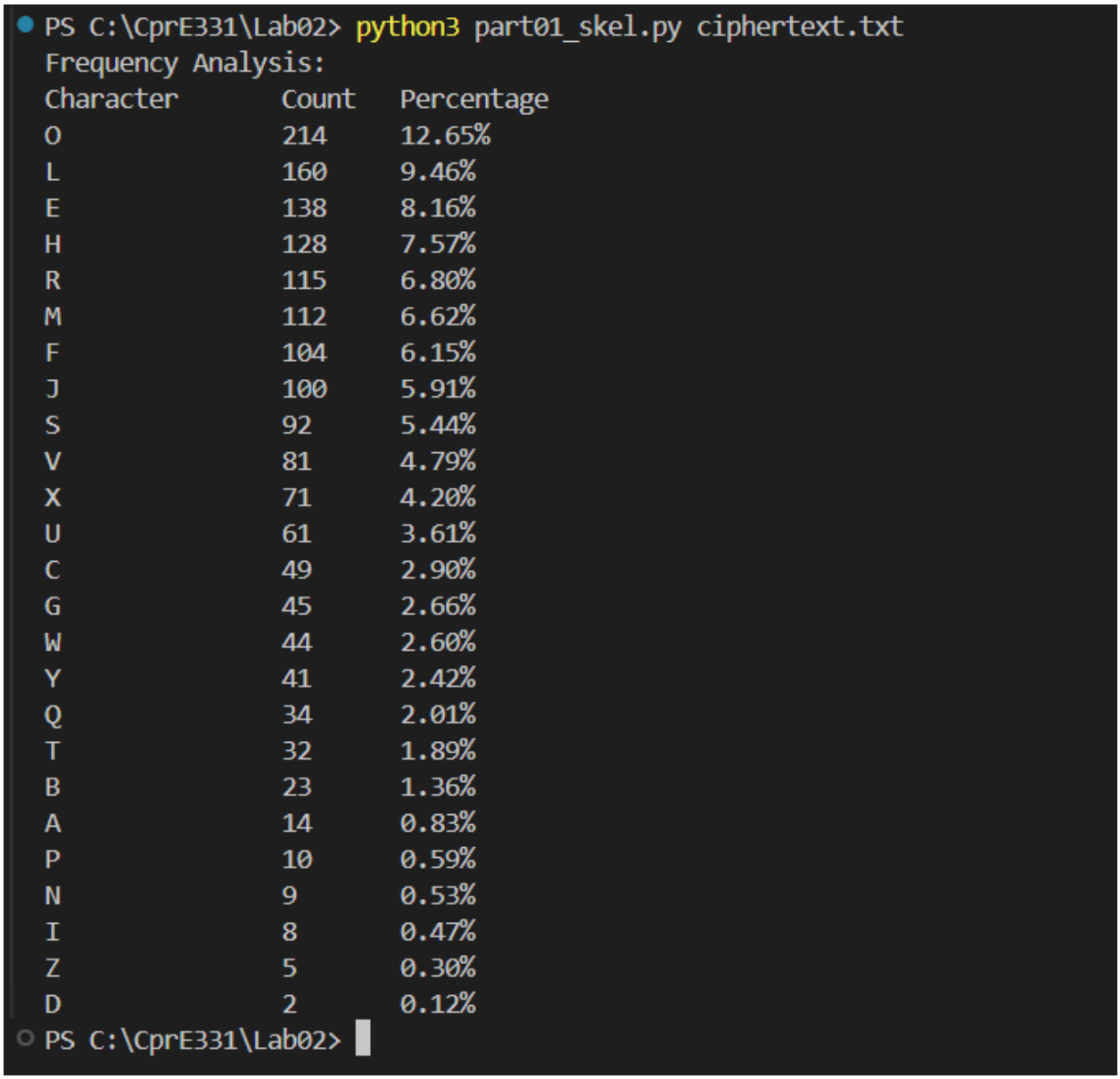
Lab 02 Template

Part 01

1) Take a screenshot of your ciphertext character frequencies

(5 points)



2) Documentation of the iterations to get to the plaintext message.

(15 points)

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PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
AOTDEKISLMIGAOGISFNTAIOHERWSATUWOMESHTNOMAOYTDEFERDNOARHIGEORSUCTAIOAHRSWRANLEORSUCTAOYTEVTWHAOYNFIOINLCDNPETARRACDESCSIBAMEHNPNWARUETRLENSEVNFCLEIGDIKHWPHTATWTAIORACDESHRNOHERWS
EMNTNTDAHFETDIMAOBILBEHSECLNRAOYENRDLETTESIGTDECLNAOTEVTKATDNOITDESLETTESGSIFTDENLCDNPETKDESETDEHWPHTATWTAIOAHGAVEMTDSIWYDIWTTDEFEHHNYENLTDIWYDHAFCLETDAHTUCEIGEORSUCTAIOAOTSIMWRE
HPEYAOOESHTITDERIORECTIGJEUPNHEMHERWSATUNOMTDEAFCISTNORETGOIOSEBESHAPLEICESNTAIOHAORSUCTIYSNCDUNHTERDOILIYUEBILBEHTDERIFCLEVATUIGEORSUCTAIOFETDIMHNLHIAORSENHEHOEREHHATNTAOYFISEHI
CDAHTARNTEMTERDOAXWEHTIMEGEOMNYNAOHTNMBNOREMRUPESTDSENTHOIOETDELEHHTDECSAORACLEHLENSOEMGSIFHAFCLERACDESHLAJETDEFIOINLCDNPETARRACDESNSEGIWOMNTAIONLNOMRIOTAOWETIAOGLWEOREFISERIFCLE
VEORSUCTAIONLYISATDFHWHEMTIMNUWOMESHTNOMAOYTDEHEPNHARRIORECTHAHEHHEOTANLGISNOUIOELIIJAOYTIHCERANLAQEAOTDEGAELMIGRUPESHERWSATUISNAFAOYTICSITERTHEOHATABEAOGISFNTAIOGSIFCITEOTANLPSE
NRDEHFISEIBESEVCLISAOYTDELAFATNTAIOHNOMBWLOESNPALATAEHIGMAGGESEOTEORSUCTAIOFETDIMHAHRSATARNLGISMEBELICAOYFISEHERWSEHUHTEFHFIOINLCDNPETARRACDESHKDALEEMWRNTAIONLNSEAODESEOTLUKENJPE
RNWHETDEUNSEBWLOESNPLETIGSEXWEORUNONLUHAHNTTNRJHPUNONLUQAOYTDEGSEXWEORUIGLETTESHAONRACDESTEVTNRSUCTNONLUHTRNOENHALUYWEHHTDERISSEHCIOMAOYLETTESHAOTDECLNAOTEVTTDESEPUMERSUCTAOYTDEF
EHHNYEKATDIWTTDEOEEMGISTDEEORSUCTAIOJEUTIRIWOTESNRTHWRDBWLOESNPALATAEHFIMESOEORSUCTAIOTERDOAXWEHEFCLIUFISEMUONFARFETDIMHHWRDNHCILUNLCDNPETARRACDESHKDARDWHEFWLTACLERACDESNLCDNPETH
TIEORSUCTTDETEVTTDEHEFETDIMHHAYOAGARNOTLURIFCLARNTEGSEXWEORUNONLUHAHFNJAOYTDERACDESFWRDDNSMESTIPSENJGWSTDESNMBNOREFEOTHAORSUCTIYSNCDUAORLWMAOYTDEWHEIGRIFCWTNTAIONLNLYISATDFHNOMRS
UCTIYSNCDARCSITIRILHEOHWSETDEAOTEYSATUNOMRIOGAMEOTANLATUIGMNTNAONOAORSENHAOYLUMAYATNLKISLM
PS C:\CprE331\Lab02>
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```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
AOTDIKESLMEGAOGESFNTAEOHIRWSATUWOMISHTNOMAOYTDIFIRDNOARHEGIORSUCTAEOAHRSWRANLIORSUCTAOYTIVTWHAOYNFEOENLCDNPITARRACDISCSEBAMIHNPNHARUITRLINSIVNFCLIEGDEKHWPHTATWTAEORACDISHRNOHIRWS
IMNTNTDAHFITDEMAOBELBIHSICLNRAOYINRDLITTTISEGTDICLNAOTIVTKATDNOETDISLITTISGSEFTDINLCDNPITKDISITDIHWPHTATWTAEOAHGAVIMTDSEWYDEWTTDIFIHHNYINLTDEWYDHAFCLITDAHTUCIEGIORSUCTAEOAOTSEMWRI
HPIYAOOISHTETDIREORICTEGJIUPNHIMHIRWSATUNOMTDIAFCESTNORIEGOEOSIBISHAPLIECISNTAEOHAORSUCTEYSNCDUNHTIRDOELEYUIBELBIHTDIREFCLIVATUEGIORSUCTAEOFITDEMHNLHEAORSINHIHOIRIHHATNTAOYFESIHE
CDAHTARNTIMTIRDOAXWIHTEMIGIOMNYNAOHTNMBNORIMRUPISTDSINTHOEOITDILTHHTDICSAORACLIHLINSOIMGSEFHAFCLIRACDISHLAJITDIFEOENLCDNPITARRACDISNSIGEWOMNTAEONLNOMREOTAOWITEAOGLWIORIFESIREFCLI
VIORSUCTAEONLYESATDFHWHIMTEMNUWOMISHTNOMAOYTDIHIPNHARREORICTHAHIHHIOTANLGESNOUEOILEEJAOYTEHCIRANLAQIAOTDIGAILMEGRUPISHIRWSATUESNAFAOYTECSETIRTHIOHATABIAOGESFNTAEOGSEFCETIOTANLPSI
NRDIHFESIEBISIVCLESAOYTDILAFATNTAEOHNOMBWLOISNPALATAIHEGMAGGISIOTIORSUCTAEOFITDEMHAHRSATARNLGESMIBILECAOYFESIHIRWSIHUHTIFHFEOENLCDNPITARRACDISHKDALIIMWRNTAEONLNSIAODISIOTLUKINJPI
RNWHITDIUNSIBWLOISNPLITEGSIXWIORUNONLUHAHNTTNRJHPUNONLUQAOYTDIGSIXWIORUEGLITTISHAONRACDISTIVTNRSUCTNONLUHTRNOINHALUYWIHHTDIRESSIHCEQMAOYLITTISHAOTDICLNAOTIVTTDISIPUMIRSUCTAOYTDIF
IHHNYIKATDEWTTDIOIIMGESTDIIORSUCTAEOJIUTEREWOTISNRTHWRDBWLOISNPALATAIHFEMISOIORSUCTAEOTIRDOAXWIHIFCLEUFESIMUONFARFITDEMHHWRDNHCELUNLCDNPITARRACDISHKDARDWHIFWLTACLIRACDISNLCDNPITH
TEIORSUCTTDITIVTTDIHIFITDEMHHAYOAGARNOTLUREFCLARNTIGSIXWIORUNONLUHAHFNJAOYTDIRACDISFWRDDNSMISTEPSINJGWSTDISNMBNORIFIOTHAORSUCTEYSNCDUAORLWMAOYTDIWHIEGREFCWTNTAEONLNLYESATDFHNOMRS
UCTEYSNCDARCSETERELHIOHWSITDIAOTIYSATUNOMREOGAMIOTANLATUEGMNTNAONOAORSINHAOYLUMAYATNLKESLM
PS C:\CprE331\Lab02>
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```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
AOTDIKESRMEGAOGESFNTAEOHILWSATUWOMISHTNOMAOYTDIFILDNOALHEGIOLSUCTAEOAHLSWLANRIOLSUCTAOYTIVTWHAOYNFEOENRCDNPITALLACDISCSEBAMIHNPNHALUITLRINSIVNFCRIEGDEKHWPHTATWTAEOLACDISHLNOHILWS
IMNTNTDAHFITDEMAOBERBIHSICRNLAOYINLDRITTTISEGTDICRNAOTIVTKATDNOETDISRITTISGSEFTDINRCDNPITKDISITDIHWPHTATWTAEOAHGAVIMTDSEWYDEWTTDIFIHHNYINRTDEWYDHAFCRITDAHTUCIEGIOLSUCTAEOAOTSEMWLI
HPIYAOOISHTETDILEOLICTEGJIUPNHIMHILWSATUNOMTDIAFCESTNOLIEGOEOSIBISHAPRIECISNTAEOHAOLSUCTEYSNCDUNHTILDOEREYUIBERBIHTDILEFCRIVATUEGIOLSUCTAEOFITDEMNRHEAOLSINHIHOILIHHATNTAOYFESIHE
CDAHTALNTIMTILDOAXWIHTEMIGIOMNYNAOHTNMBNOLIMLUPISTDSINTHOEOITDIRIHHTDICSAOLACRIHRINSOIMGSEFHAFCRILACDISHRAJITDIFEOENRCDNPITALLACDISNSIGEWOMNTAEONRNOMLEOTAOWITEAOGRWIOLIFESILEFCRI
VIOLSUCTAEONRYESATDFHWHIMTEMNUWOMISHTNOMAOYTDIHIPNHALLEOLICTHAHIHHIOTANRGESNOUEOIREEJAOYTEHCILANRAQIAOTDIGAIRMEGLUPISHILWSATUESNAFAOYTECSETILTHIOHATABIAOGESFNTAEOGSEFCETIOTANRPSI
NLDIHFESIEBISIVCRESAOYTDIRAFATNTAEOHNOMBWROISNPARATAIHEGMAGGISIOTIOLSUCTAEOFITDEMHAHLSATALNRGESMIBIRECAOYFESIHILWSIHUHTIFHFEOENRCDNPITALLACDISHKDARIIMWLNTAEONRNSIAODISIOTRUKINJPI
LNWHITDIUNSIBWROISNPRITEGSIXWIOLUNONRUHAHNTTNLJHPUNONRUQAOYTDIGSIXWIOLUEGRITTISHAONLACDISTIVTNLSUCTNONRUHTLNOINHARUYWIHHTDILESSIHCEQMAOYRITTISHAOTDICRNAOTIVTTDISIPUMILSUCTAOYTDIF
IHHNYIKATDEWTTDIOIIMGESTDIIOLSUCTAEOJIUTELEWOTISNLTHWLDBWROISNPARATAIHFEMISOIOLSUCTAEOTILDOAXWIHIFCREUFESIMUONFALFITDEMHHWLDNHCERUNRCDNPITALLACDISHKDALDWHIFWRTACRILACDISNRCDNPITH
TEIOLSUCTTDITIVTTDIHIFITDEMHHAYOAGALNOTRULEFCRALNTIGSIXWIOLUNONRUHAHFNJAOYTDILACDISFWLDDNSMISTEPSINJGWSTDISNMBNOLIFIOTHAOLSUCTEYSNCDUAOLRWMAOYTDIWHIEGLEFCWTNTAEONRNRYESATDFHNOMLS
UCTEYSNCDALCSETELERHIOHWSITDIAOTIYSATUNOMLEOGAMIOTANRATUEGMNTNAONOAOLSINHAOYRUMAYATNRKESRM
PS C:\CprE331\Lab02>
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PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
DOTAUKJSRMJGDOGJSFNTDJOLUHWSDTUWOMUSLTNOMDOTTAUFUHANODHLJGUOHSUCTDJODLHSWHDNRUOHSUCTDOTTUVTWLDOTNFJOJNRCANPUTDHHDCAUSCSJADMULNPNLDHUUTHRUNSUVNFCRUJGAJKLWPLTDTWTDJOHDCAUSLHNOLUHWS
UMNTNTADLFUTAJMDOAJRAULSUCRNHDOTUNHARUTTUSJGTAUCRNDOTUVTKDTANOJTAUSRUTTUSGSJFTAUNRCANPUTKAUSUTAULWPLTDTWTDJODLGDVUMTASJWTAJWTTAUFULLNTUNRTAJWTALDFCRUTADLTUCUJGUOHSUCTDJODOTSJMWHU
LPUTDOOUSLTJTAUHJOHUCTJGEUUPNLUMLUHWSDTUNOMTAUDFCJSTNOHUJGOJOSUAUSLDPRUJCUSNTDJOLDOHSUCTJTSNCAUNLTUHAOJRJTUUAJRAULTAUHJFCRUVDTUJGUOHSUCTDJOFUTAJMLNRLJDOHSUNLULOUHULLDTNTDOTFJSULJ
CADLTDHNTUMTUHAODXWULTJMUGUOMNTNDOLTNMANOHUMHUPUSTASUNTLOJOUTAURULLTAUCSDOHDCRULRUNSOUMGSJFLDFCRUHDCAUSLRDEUTAUFJOJNRCANPUTDHHDCAUSNSUGJWOMNTDJONRNOMHJOTDOWUTJDOGRWUOHUFJSUHJFCRU
VUOHSUCTDJONRTJSDTAFLWLUMTJMNUWOMUSLTNOMDOTTAULUPNLDHHJOHUCTLDLULLUOTDNRGJSNOUJOURJJEDOTTJLCUHDNRDQUDOTAUGDURMJGHUPUSLUHWSDTUJSNDFDOTTJCSJTUHTLUOLDTDAUDOGJSFNTDJOGSJFCJTUOTDNRPSU
NHAULFJSUJAUSUVCRJSDOTTAURDFDTNTDJOLNOMAWROUSNPDRDTDULJGMDGGUSUOTUOHSUCTDJOFUTAJMLDLHSDTDHNRGJSMUAURJCDOTFJSULUHWSULULTUFLFJOJNRCANPUTDHHDCAUSLKADRUUMWHNTDJONRNSUDOAUSUOTRUKUNEPU
HNWLUTAUUNSUAWROUSNPRUTJGSUXWUOHUNONRULDLNTTNHELPUNONRUQDOTTAUGSUXWUOHUJGRUTTUSLDONHDCAUSTUVTNHSUCTNONRULTHNOUNLDRUTWULLTAUHJSSULCJOMDOTRUTTUSLDOTAUCRNDOTUVTTAUSUPUMUHSUCTDOTTAUF
ULLNTUKDTAJWTTAUOUUMGJSTAUUOHSUCTDJOEUUTJHJWOTUSNHTLWHAAWROUSNPDRDTDULFJMUSOUOHSUCTDJOTUHAODXWULUFCRJUFJSUMUONFDHFUTAJMLLWHANLCJRUNRCANPUTDHHDCAUSLKADHAWLUFWRTDCRUHDCAUSNRCANPUTL
TJUOHSUCTTAUTUVTTAULUFUTAJMLLDTODGDHNOTRUHJFCRDHNTUGSUXWUOHUNONRULDLFNEDOTTAUHDCAUSFWHAANSMUSTJPSUNEGWSTAUSNMANOHUFUOTLDOHSUCTJTSNCAUDOHRWMDOTTAUWLUJGHJFCWTNTDJONRNRTJSDTAFLNOMHS
UCTJTSNCADHCSJTJHJRLUOLWSUTAUDOTUTSDTUNOMHJOGDMUOTDNRDTUJGMNTNDONODOHSUNLDOTRUMDTDTNRKJSRM
PS C:\CprE331\Lab02>
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PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
AOTDEKISLMIGAOGISFNTAIOHERWSATUWOMESHTNOMAOYTDEFERDNOARHIGEORSUCTAIOAHRSWRANLEORSUCTAOYTEVTWHAOYNFIOINLCDNPETARRACDESCSIBAMEHNPNHARUETRLENSEVNFCLEIGDIKHWPHTATWTAIORACDESHRNOHERWS
EMNTNTDAHFETDIMAOBILBEHSECLNRAOYENRDLETTESIGTDECLNAOTEVTKATDNOITDESLETTESGSIFTDENLCDNPETKDESETDEHWPHTATWTAIOAHGAVEMTDSIWYDIWTTDEFEHHNYENLTDIWYDHAFCLETDAHTUCEIGEORSUCTAIOAOTSIMWRE
HPEYAOOESHTITDERIORECTIGJEUPNHEMHERWSATUNOMTDEAFCISTNORETGOIOSEBESHAPLEICESNTAIOHAORSUCTIYSNCDUNHTERDOILIYUEBILBEHTDERIFCLEVATUIGEORSUCTAIOFETDIMHNLHIAORSENHEHOEREHHATNTAOYFISEHI
CDAHTARNTEMTERDOAXWEHTIMEGEOMNYNAOHTNMBNOREMRUPESTDSENTHOIOETDELEHHTDECSAORACLEHLENSOEMGSIFHAFCLERACDESHLAJETDEFIOINLCDNPETARRACDESNSEGIWOMNTAIONLNOMRIOTAOWETIAOGLWEOREFISERIFCLE
VEORSUCTAIONLYISATDFHWHEMTIMNUWOMESHTNOMAOYTDEHEPNHARRIORECTHAHEHHEOTANLGISNOUIOELIIJAOYTIHCERANLAQEAOTDEGAELMIGRUPESHERWSATUISNAFAOYTICSITERTHEOHATABEAOGISFNTAIOGSIFCITEOTANLPSE
NRDEHFISEIBESEVCLISAOYTDELAFATNTAIOHNOMBWLOESNPALATAEHIGMAGGESEOTEORSUCTAIOFETDIMHAHRSATARNLGISMEBELICAOYFISEHERWSEHUHTEFHFIOINLCDNPETARRACDESHKDALEEMWRNTAIONLNSEAODESEOTLUKENJPE
RNWHETDEUNSEBWLOESNPLETIGSEXWEORUNONLUHAHNTTNRJHPUNONLUQAOYTDEGSEXWEORUIGLETTESHAONRACDESTEVTNRSUCTNONLUHTRNOENHALUYWEHHTDERISSEHCIOMAOYLETTESHAOTDECLNAOTEVTTDESEPUMERSUCTAOYTDEF
EHHNYEKATDIWTTDEOEEMGISTDEEORSUCTAIOJEUTIRIWOTESNRTHWRDBWLOESNPALATAEHFIMESOEORSUCTAIOTERDOAXWEHEFCLIUFISEMUONFARFETDIMHHWRDNHCILUNLCDNPETARRACDESHKDARDWHEFWLTACLERACDESNLCDNPETH
TIEORSUCTTDETEVTTDEHEFETDIMHHAYOAGARNOTLURIFCLARNTEGSEXWEORUNONLUHAHFNJAOYTDERACDESFWRDDNSMESTIPSENJGWSTDESNMBNOREFEOTHAORSUCTIYSNCDUAORLWMAOYTDEWHEIGRIFCWTNTAIONLNLYISATDFHNOMRS
UCTIYSNCDARCSITIRILHEOHWSETDEAOTEYSATUNOMRIOGAMEOTANLATUIGMNTNAONOAORSENHAOYLUMAYATNLKISLM
PS C:\CprE331\Lab02>
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PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
XOTAEKISLMIGXOGISCNTXIOHERWSXTUWOMESHTNOMXOYTAECERANOXRHIGEORSUFTXIOXHRSWRXNLEORSUFTXOYTEVTWHXOYNCIOINLFANBETXRRXFAESFSIPXMEHNBNHXRUETRLENSEVNCFLEIGAIKHWBHTXTWTXIORXFAESHRNOHERWS
EMNTNTAXHCETAIMXOPILPEHSEFLNRXOYENRALETTESIGTAEFLNXOTEVTKXTANOITAESLETTESGSICTAENLFANBETKAESETAEHWBHTXTWTXIOXHGXVEMTASIWYAIWTTAECEHHNYENLTAIWYAHXCFLETAXHTUFEIGEORSUFTXIOXOTSIMWRE
HBEYXOOESHTITAERIOREFTIGJEUBNHEMHERWSXTUNOMTAEXCFISTNORETGOIOSEPESHXBLIFESNTXIOHXORSUFTIYSNFAUNHTERAOILIYUEPILPEHTAERICFLEVXTUIGEORSUFTXIOCETAIMHNLHIXORSENHEHOEREHHXTNTXOYCISEHI
FAXHTXRNTEMTERAOXDWEHTIMEGEOMNYNXOHTNMPNOREMRUBESTASENTHOIOETAELEHHTAEFSXORXFLEHLENSOEMGSICHXCFLERXFAESHLXJETAECIOINLFANBETXRRXFAESNSEGIWOMNTXIONLNOMRIOTXOWETTIXOGLWEORECISERICFLE
VEORSUFTXIONLYISXTACHWHEMTIMNUWOMESHTNOMXOYTAEHEBNHXRRIOREFTHXHEHHEOTXNLGISNOUIOELIIJXOYTIHFERXNLXQEXOTAEGXELMIGRUBESHERWSXTUISNXCXOYTIFSITERTHEOHXTXPEXOGISCNTXIOGSICFITEOTXNLBSE
NRAEHCISEIPESEVFLISXOYTAELXCXTNTXIOHNOMPWLOESNBXLXTXEHIGMXGGESEOTEORSUFTXIOCETAIMHXHRSXTXRNLGISMEPELIFXOYCISEHERWSEHUHTECHCIOINLFANBETXRRXFAESHKAXLEEMWRNTXIONLNSEXOAESEOTLUKENJBE
RNWHETAEUNSEPWLOESNBLETIGSEDWEORUNONLUHXHNTTNRJHBUNONLUQXOYTAEGSEDWEORUIGLETTESHXONRXFAESTEVTNRSUFTNONLUHTRNOENHXLUYWEHHTAERISSEHFIOMXOYLETTESHXOTAEFLNXOTEVTTAESEBUMERSUFTXOYTAEC
EHHNYEKXTAIWTTAEOEEMGISTAEEORSUFTXIOJEUTIRIWOTESNRTHWRAPWLOESNBXLXTXEHCIMESOEORSUFTXIOTERAOXDWEHECFLIUCISEMUONCXRCETAIMHHWRANHFILUNLFANBETXRRXFAESHKAXRAWHECWLTXFLERXFAESNLFANBETH
TIEORSUFTTAETEVTTAEHECETAIMHHXYOXGXRNOTLURICFLXRNTEGSEDWEORUNONLUHXHCNJXOYTAERXFAESCWRAANSMESTIBSENJGWSTAESNMPNORECEOTHXORSUFTIYSNFAUXORLWMXOYTAEWHEIGRICFWTNTXIONLNLYISXTACHNOMRS
UFTIYSNFAXRFSITIRILHEOHWSETAEXOTEYSXTUNOMRIOGXMEOTXNLXTUIGMNTNXONOXORSENHXOYLUMXYXTNLKISLM
PS C:\CprE331\Lab02>
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```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
XOTAJKISLMIGXOGISCNTXIOHJRWSXTUWOMJSHTNOMXOYTAJCJRANOXRHIGJORSUFTXIOXHRSWRXNLJORSUFTXOYTJVTWHXOYNCIOINLFANBJTXRRXFAJSFSIPXMJHNBNHXRUJTRLJNSJVNCFLJIGAIKHWBHTXTWTXIORXFAJSHRNOHJRWS
JMNTNTAXHCJTAIMXOPILPJHSJFLNRXOYJNRALJTTJSIGTAJFLNXOTJVTKXTANOITAJSLJTTJSGSICTAJNLFANBJTKAJSJTAJHWBHTXTWTXIOXHGXVJMTASIWYAIWTTAJCJHHNYJNLTAIWYAHXCFLJTAXHTUFJIGJORSUFTXIOXOTSIMWRJ
HBJYXOOJSHTTITAJRIORJFTIGEJUBNHJMHJRWSXTUNOMTAJXCFISTNORJIGOIOSJPJSHXBLJIFJSNTXIOHXORSUFTIYSNFAUNHTJRAOILIYUJPILPJHTAJRICFLJVXTUIGJORSUFTXIOCJTAIMHNLHIXORSJNHJHOJRJHHXTNTXOYCISJHI
FAXHTXRNTJMTJRAOXDWJHTIMJGJOMNYNXOHTNMPNORJMRUBJSTASJNTHOIOJTAJLJHHTAJFSXORXFLJHLJNSOJMGSICHXCFLJRXFAJSHLXEJTAJCIOINLFANBJTXRRXFAJSNSJGIWOMNTXIONLNOMRIOTXOWJTIXOGLWJORJCISJRICFLJ
VJORSUFTXIONLYISXTACHWHJMTIMNUWOMJSHTNOMXOYTAJHJBNHXRRIORJFTHXHJHHJOTXNLGISNOUIOJLIIEXOYTIHFJRXNLXQJXOTAJGXJLMIGRUBJSHJRWSXTUISNXCXOYTIFSITJRTHJOHXTXPJXOGISCNTXIOGSICFITJOTXNLBSJ
NRAJHCISJIPJSJVFLISXOYTAJLXCXTNTXIOHNOMPWLOJSNBXLXTXJHIGMXGGJSJOTJORSUFTXIOCJTAIMHXHRSXTXRNLGISMJPJLIFXOYCISJHJRWSJHUHTJCHCIOINLFANBJTXRRXFAJSHKAXLJJMWRNTXIONLNSJXOAJSJOTLUKJNEBJ
RNWHJTAJUNSJPWLOJSNBLJTIGSJDWJORUNONLUHXHNTTNREHBUNONLUQXOYTAJGSJDWJORUJGLJTTJSHXONRXFAJSTJVTNRSUFTNONLUHTRNOJNHXLUYWJHHTAJRISSJHFIOMXOYLJTTJSHXOTAJFLNXOTJVTTAJSJBUMJRSUFTXOYTAJC
JHHNYJKXTAIWTTAJOOJMGISTAJJORSUFTXIOEJUTJRIWOTJSNRTHWRAPWLOJSNBXLXTXJHCIMJSOJORSUFTXIOTJRAOXDWJHJCFLIUCISJMUONCXRCJTAIMHHWRANHFILUNLFANBJTXRRXFAJSHKAXRAWHJCWLTXFLJRXFAJSNLFANBJTH
TIJORSUFTTAJTJVTTAJHJCJTAIMHHXYOXGXRNOTLURICFLXRNTJGSJDWJORUNONLUHXHCNEXOYTAJRXFAJSCWRAANSMJSTIBSJNEGWSTAJSNMPNORJCJOTHXORSUFTIYSNFAUXORLWMXOYTAJWHJIGRICFWTNTXIONLNLYISXTACHNOMRS
UFTIYSNFAXRFSITTIRILHJOHWSJTAJXOTJYSXTUNOMRIOGXMJOTXNLXTUIGMNTNXONOXORSJNHXOYLUMXYXTNLKISLM
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
XOTAJKFSLMFGXOGFSCNTXFOHJRWSXTUWOMJSHTNOMXOYTAJCJRANOXRHFGJORSUITXFOXHRSWRXNLJORSUITXOYTJVTWHXOYNCFOFNLIANBJTXRRXIAJSISFPXMJHNBNHXRUJTRLJNSJVNCILJFGAFKHWBHTXTWTXFORXIAJSHRNOHJRWS
JMNTNTAXHCJTAFMXOPFLPJHSJILNRXOYJNRALJTTJSFGTAJILNXOTJVTKXTANOFTAJSLJTTJSGSFCTAJNLIANBJTKAJSJTAJHWBHTXTWTXFOXHGXVJMTASFWYAFWTTAJCJHHNYJNLTAFWYAHXCILJTAXHTUIJFGJORSUITXFOXOTSFMWRJ
HBJYXOOJSHTFTAJRFORJITFGEJUBNHJMHJRWSXTUNOMTAJXCIFSTNORJFGOFOSJPJSHXBLJFIJSNTXFOHXORSUITFYSNIAUNHTJRAOFLFYUJPFLPJHTAJRFCILJVXTUFGJORSUITXFOCJTAFMHNLHFXORSJNHJHOJRJHHXTNTXOYCFSJHF
IAXHTXRNTJMTJRAOXDWJHTFMJGJOMNYNXOHTNMPNORJMRUBJSTASJNTHOFOJTAJLJHHTAJISXORXILJHLJNSOJMGSFCHXCILJRXIAJSHLXEJTAJCFOFNLIANBJTXRRXIAJSNSJGFWOMNTXFONLNOMRFOTXOWJTFXOGLWJORJCFSJRFCILJ
VJORSUITXFONLYFSXTACHWHJMTFMNUWOMJSHTNOMXOYTAJHJBNHXRRFORJITHXHJHHJOTXNLGFSNOUFOJLFFEXOYTFHIJRXNLXQJXOTAJGXJLMFGRUBJSHJRWSXTUFSNXCXOYTFISFTJRTHJOHXTXPJXOGFSCNTXFOGSFCIFTJOTXNLBSJ
NRAJHCFSJFPJSJVILFSXOYTAJLXCXTNTXFOHNOMPWLOJSNBXLXTXJHFGMXGGJSJOTJORSUITXFOCJTAFMHXHRSXTXRNLGFSMJPJLFIXOYCFSJHJRWSJHUHTJCHCFOFNLIANBJTXRRXIAJSHKAXLJJMWRNTXFONLNSJXOAJSJOTLUKJNEBJ
RNWHJTAJUNSJPWLOJSNBLJTFGSJDWJORUNONLUHXHNTTNREHBUNONLUQXOYTAJGSJDWJORUFGLJTTJSHXONRXIAJSTJVTNRSUITNONLUHTRNOJNHXLUYWJHHTAJRFSSJHIFOMXOYLJTTJSHXOTAJILNXOTJVTTAJSJBUMJRSUITXOYTAJC
JHHNYJKXTAFWTTAJOOJMGFSTAJJORSUITXFOEJUTFRFWOTJSNRTHWRAPWLOJSNBXLXTXJHCFMJSOJORSUITXFOTJRAOXDWJHJCILFUCFSJMUONCXRCJTAFMHHWRANHIFLUNLIANBJTXRRXIAJSHKAXRAWHJCWLTXILJRXIAJSNLIANBJTH
TFJORSUITTAJTJVTTAJHJCJTAFMHHXYOXGXRNOTLURFCILXRNTJGSJDWJORUNONLUHXHCNEXOYTAJRXIAJSCWRAANSMJSTFBSJNEGWSTAJSNMPNORJCJOTHXORSUITFYSNIAUXORLWMXOYTAJWHJFGRFCIWTNTXFONLNLYFSXTACHNOMRS
UITFYSNIAXRISFTFRFLHJOHWSJTAJXOTJYSXTUNOMRFOGXMJOTXNLXTUFGMNTNXONOXORSJNHXOYLUMXYXTNLKFSLM
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
XOTAJHFSLMFQXOQFSCNTXFOKJRWSXTUWOMJSKTNOMXOYTAJCJRANOXRKFQJORSUITXFOXKRSWRXNLJORSUITXOYTJVTWKXOYNCFOFNLIANBJTXRRXIAJSISFPXMJKNBNKXRUJTRLJNSJVNCILJFQAFHKWBKTXTWTXFORXIAJSKRNOKJRWS
JMNTNTAXKCJTAFMXOPFLPJKSJILNRXOYJNRALJTTJSFQTAJILNXOTJVTHXTANOFTAJSLJTTJSQSFCTAJNLIANBJTHAJSJTAJKWBKTXTWTXFOXKQXVJMTASFWYAFWTTAJCJKKNYJNLTAFWYAKXCILJTAXKTUIJFQJORSUITXFOXOTSFMWRJ
KBJYXOOJSKTFTAJRFORJITFQEJUBNKJMKJRWSXTUNOMTAJXCIFSTNORJFQOFOSJPJSKXBLJFIJSNTXFOKXORSUITFYSNIAUNKTJRAOFLFYUJPFLPJKTAJRFCILJVXTUFQJORSUITXFOCJTAFMKNLKFXORSJNKJKOJRJKKXTNTXOYCFSJKF
IAXKTXRNTJMTJRAOXDWJKTFMJQJOMNYNXOKTNMPNORJMRUBJSTASJNTKOFOJTAJLJKKTAJISXORXILJKLJNSOJMQSFCKXCILJRXIAJSKLXEJTAJCFOFNLIANBJTXRRXIAJSNSJQFWOMNTXFONLNOMRFOTXOWJTFXOQLWJORJCFSJRFCILJ
VJORSUITXFONLYFSXTACKXWKJMTFMNUWOMJSKTNOMXOYTAJKJBNKXRRFORJITKXKJKKJOTXNLQFSNOUFOJLFFEXOYTFKIJRXNLXGJXOTAJQXJLMFQRUBJSKJRWSXTUFSNXCXOYTFISFTJRTKJOKXTXPJXOQFSCNTXFOQSFCIFTJOTXNLBSJ
NRAJKCFSJFPJSJVILFSXOYTAJLXCXTNTXFOKNOMPWLOJSNBXLXTXJKFQMXQQJSJOTJORSUITXFOCJTAFMKXKRSXTXRNLQFSMJPJLFIXOYCFSJKJRWSJKUKTJCKCFOFNLIANBJTXRRXIAJSKHAXLJJMWRNTXFONLNSJXOAJSJOTLUHJNEBJ
RNWKJTAJUNSJPWLOJSNBLJTFQSJDWJORUNONLUKXKNTTNREKBUNONLUGXOYTAJQSJDWJORUFQLJTTJSKXONRXIAJSTJVTNRSUITNONLUKTRNOJNKXLUYWJKKTAJRFSSJKIFOMXOYLJTTJSKXOTAJILNXOTJVTTAJSJBUMJRSUITXOYTAJC
JKKNYJHXTAFWTTAJOJJMQFSTAJJORSUITXFOEJUTFRFWOTJSNRTKWRAPWLOJSNBXLXTXJKCFMJSOJORSUITXFOTJRAOXDWJKJCILFUCFSJMUONCXRCJTAFMKKWRANKIFLUNLIANBJTXRRXIAJSKHAXRAWKJCWLTXILJRXIAJSNLIANBJTK
TFJORSUITTAJTJVTTAJKJCJTAFMKKXYOXQXRNOTLURFCILXRNTJQSJDWJORUNONLUKXKCNEXOYTAJRXIAJSCWRAANSMJSTFBSJNEQWSTAJSNMPNORJCJOTKXORSUITFYSNIAUXORLWMXOYTAJWKJFQRFCIWTNTXFONLNLYFSXTACKNOMRS
UITFYSNIAXRISFTFRFLKJOKWSJTAJXOTJYSXTUNOMRFOQXMJOTXNLXTUFQMNTNXONOXORSJNKXOYLUMXYXTNLHFSLM
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
XOTARHFSLMFQXOQFSCNTXFOKRJWSXTUWOMRSKTNOMXOYTARCRJANOXJKFQRQJSUZTXFOXKJSWJXNLROJSUZTXOYTRVTWKXOYNCFOFNLZANBRTXJJXZARSZSFPXMRKNBNKXJURTJLRNSRVNCZLRFQAFHKWBKTXTWTXFOJXZARSKJNOKRJWS
RMNTNTAXKCRTAFMXOPFLPRKSRZLNJXOYRNJALRTTRSFQTARZLNXOTRVTHXTANOFTARSLRTTRSQSFCTARNLZANBRTHARSRTARKWBKTXTWTXFOXKQXVRMTASFWYAFWTTARCRKKNYRNLTAFWYAKXCZLRTAXKTUZRFQROJSUZTXFOXOTSFMWJR
KBRYXOORSKTFTARJFORJITFQERUBNKRMKRJWSXTUNOMTARXCZFSTNOJRFQOFOSRPRSKXBLRFZRSNTXFOKXOJSUZTFYSNZAUNKTRJAOFLFYURPFLPRKTARJFCZLRVXTUFQROJSUZTXFOCRTAFMKNLKFXOJSRNKRKORJRKKXTNTXOYCFSRKF
ZAXKTXJNTRMTRJAOXDWRKTFMRQROMNYNXOKTNMPNOJRMJUBRSTASRNTKOFORTARLRKKTARZSXOJXZLRKLRNSORMQSFCKXCZLRJXZARSKLXERTARCFOFNLZANBRTXJJXZARSNSRQFWOMNTXFONLNOMJFOTXOWRTFXOQLWROJRCFSRJFCZLR
VROJSUZTXFONLYFSXTACKWKRMTFMNUWOMRSKTNOMXOYTARKRBNKOJJFOJRZTKXKRKKROTXNLQFSNOUFORLFFEXOYTFKZRJXNLXGRXOTARQXRLMFQJUBRSKRJWSXTUFSNXCXOYTFZSFTRJTKROKXTXPRXOQFSCNTXFOQSFCZFTROTXNLBSR
NJARKCFSRFPRSRVZLFSXOYTARLXCXTNTXFOKNOMPWLORSNBXLXTXRKFQMXQQRSROTROJSUZTXFOCRTAFMKXKJSXTXJNLQFSMRPRLFZXOYCFSRKRJWSRKUKTRCKCFOFNLZANBRTXJJXZARSKHAXLRMWJNTXFONLNSRXOARSROTLUHRNEBR
JNWKRTARUNSRPWLORSNBLRTFQSRDWROJUNONLUKXKNTTNJEKBUNONLUGXOYTARQSRDWROJUFQLRTTRSKXONJXZARSTRVTNJSUZTNONLUKTJNORNKXLUYWRKKTARJFSSRKZFOMXOYLRTTRSKXOTARZLNXOTRVTTARSRBUMRJSUZTXOYTARC
RKKNYRHXTAFWTTARORRMQFSTARROJSUZTXFOERUTFJFWOTRSNJTKWJAPWLORSNBXLXTXRKCFMRSOROJSUZTXFOTRJAOXDWRKRCZLFUCFSRMUONCXJCRTAFMKKWJANKZFLUNLZANBRTXJJXZARSKHAXJAWKRCWLTXZLRJXZARSNBRUPRJSUZTOXLTARC
TFROJSUZTTARTRVTTARKRCRTAFMKKXYOXQXJNOTLUJFCZLXJNTRQSRDWROJUNONLUKXKCNEXOYTARJXZARSCWJAANSMRSTFBSRNEQWSTARSNMPNOJRCROTKXOJSUZTFYSNZAUXOJLWMXOYTARWKRFQJFCZWTNTXFONLNLYFSXTACKNOMJS
UZTFYSNZAXJZSFTFJFLKROKWSRTARXOTRYSXTUNOMJFOQXMROTXNLXTUFQMNTNXONOXOJSRNKXOYLUMXYXTNLHFSLM
PS C:\CprE331\Lab02>
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```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
OXTARHFSYPFQOXQFSCWTOFXKRJNSOTUNXPRSKTWXPOXLTARCRJAWXOJKFQRXJSUZTOFXOKJSNJOWYRXJSUZTOXLTRVTNKOXLWCFXFWYZAWBRTOJJOZARSZSFMOPRKWBWKOJURTJYRWSRVWCZYRFQAFHKNBKTOTNTOFXJOZARSKJWXKRJNS
RPWTWTAOKCRTAFPOXMFYMRKSRZYWJOXLRWJAYRTTRSFQTARZYWOXTRVTHOTAWXFTARSYRTTRSQSFCTARWYZAWBRTHARSRTARKNBKTOTNTOFXOKQOVRPTASFNLAFNTTARCRKKWLRWYTAFNLAKOCZYRTAOKTUZRFQRXJSUZTOFXOXTSFPNJR
KBRLOXXRSKTFTARJFXJRZTFQERUBWKRPKRJNSOTUWXPTAROCZFSTWXJRFQXFSXRMRSKOBYRFZRSWTOFXKOXJSUZTFLSWZAUWKTRJAXFYFLURMFYMRKTARJFCZYRVOTUFQRXJSUZTOFXCRTAFPKWYKFOXJSRWKRKXRJRKKOTWTOXLCFSRKF
ZAOKTOJWTRPTRJAXODNRKTFPRQRXPWLWOXKTWPMWXJRPJUBRSTASRWTKXFXRTARYRKKTARZSOXJOZYRKYRWSXRPQSFCKOCZYRJOZARSKYOERTARCFXFWYZAWBRTOJJOZARSWSRQFNXPWTOFXWYWXPJFXTOXNRTFOXQYNRXJRCFSRJFCZYR
VRXJSUZTOFXWYLFSOTACKNKRPTFPWUNXPRSKTWXPOXLTARKRBWKOJJFXJRZTKOKRKKRXTOWYQFSWXUFXRYFFEOXLTFKZRJOWYOGROXTARQORYPFQJUBRSKRJNSOTUFSWOCOXLTFZSFTRJTKRXKOTOMROXQFSCWTOFXQSFCZFTRXTOWYBSR
WJARKCFSRFMRSRVZYFSOXLTARYOCOTWTOFXKWXPMNYXRSWBOYOTORKFQPOQQRSRXTRXJSUZTOFXCRTAFPKOKJSOTOJWYQFSPRMRYFZOXLCFSRKRJNSRKUKTRCKCFXFWYZAWBRTOJJOZARSKHAOYRRPNJWTOFXWYWSROXARSRXTYUHRWEBR
JWNKRTARUWSRMNYXRSWBYRTFQSRDNRXJUWXWYUKOKWTTWJEKBUWXWYUGOXLTARQSRDNRXJUFQYRTTRSKOXWJOZARSTRVTWJSUZTWXWYUKTJWXRWKOYULNRKKTARJFSSRKZFXPOXLYRTTRSKOXTARZYWOXTRVTTARSRBUPRJSUZTOXLTARC
RKKWLRHOTAFNTTARXRRPQFSTARRXJSUZTOFXERUTFJFNXTRSWJTKNJAMNYXRSWBOYOTORKCFPRSXRXJSUZTOFXTRJAXODNRKRCZYFUCFSRPUXWCOJCRTAFPKKNJAWKZFYUWYZAWBRTOJJOZARSKHAOJANKRCNYTOZYRJOZARSWYZAWBRTK
TFRXJSUZTTARTRVTTARKRCRTAFPKKOLXOQOJWXTYUJFCZYOJWTRQSRDNRXJUWXWYUKOKCWEOXLTARJOZARSCNJAAWSPRSTFBSRWEQNSTARSWPMWXJRCRXTKOXJSUZTFLSWZAUOXJYNPOXLTARNKRFQJFCZNTWTOFXWYWYLFSOTACKWXPJS
UZTFLSWZAOJZSFTFJFYKRXKNSRTAROXTRLSOTUWXPJFXQOPRXTOWYOTUFQPWTWOXWXOXJSRWKOXLYUPOLOTWYHFSYP
PS C:\CprE331\Lab02>
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```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
OXYARHFQPTFUOXUFQCWYOFXKRJNQOYSNXTRQKYWXTOXLYARCRJAWXOJKFURXJQSZYOFXOKJQNJOWPRXJQSZYOXLYRVYNKOXLWCFXFWPZAWBRYOJJOZARQZQFMOTRKWBWKOJSRYJPRWQRVWCZPRFUAFHKNBKYOYNYOFXJOZARQKJWXKRJNQ
RTWYWYAOKCRYAFTOXMFPMRKQRZPWJOXLRWJAPRYYRQFUYARZPWOXYRVYHOYAWXFYARQPRYYRQUQFCYARWPZAWBRYHARQRYARKNBKYOYNYOFXOKUOVRTYAQFNLAFNYYARCRKKWLRWPYAFNLAKOCZPRYAOKYSZRFURXJQSZYOFXOXYQFTNJR
KBRLOXXRQKYFYARJFXJRZYFUERSBWKRTKRJNQOYSWXTYAROCZFQYWJXFUXFXQRMRQKOBPRFZRQWYOFXKOXJQSZYFLQWZASWKYRJAXFPFLSRMFPMRKYARJFCZPRVOYSFURXJQSZYOFXCRYAFTKWPKFOXJQRWKRIXRJRKKOYWYOXLCFQRKF
ZAOKYOJWYRTYRJAXODNRKYFTRURXTWLWOXKYWTMWXJRTJSBRQYAQRWYKXFXRYARPRKKYARZQOXJOZPRKPRWQXRTUQFCKOCZPRJOZARQKPOERYARCFXFWPZAWBRYOJJOZARQWQRUFNXTWYOFXWPWXTJFXYOXNRYFOXUPNRXJRCFQRJFCZPR
VRXJQSZYOFXWPLFQOYACKNKRTYFTWSNXTRQKYWXTOXLYARKRBWKOJJFXJRZYKOKRKKRXYOWPUFQWXSFXRPFFEOXLYFKZRJOWPOGROXYARUORPTFUJSBRQKRJNQOYSFQWOCOXLYFZQFYRJYKRXKOYOMROXUFQCWYOFXUQFCZFYRXYOWPBQR
WJARKCFQRFMRQRVZPFQOXLYARPOCOYWYOFXKWXTMNPXRQWBOPOYORKFUTOUURQRXYRXJQSZYOFXCRYAFTKOKJQOYOJWPUFQTRMRPFZOXLCFQRKRJNQRKSKYRCKCFXFWPZAWBRYOJJOZARQKHAOPRRTNJWYOFXWPWQROXARQRXYPSHRWEBR
JWNKRYARSWQRMNPXRQWBPRYFUQRDNRXJSWXWPSKOKWYWJEKBSWXWPSGOXLYARUQRDNRXJSFUPRYYRQKOXWJOZARQYRVYWJQSZYWXWPSKYJWXRWKOPSLNRKKYARJFQQRKZFXTOXLPRYYRQKOXYARZPWOXYRVYYARQRBSTRJQSZYOXLYARC
RKKWLRHOYAFNYYARXRRTUFQYARRXJQSZYOFXERSYFJFNXYRQWJYKNJAMNPXRQWBOPOYORKCFTRQXRXJQSZYOFXYRJAXODNRKRCZPFSCFQRTSXWCOJCRYAFTKKNJAWKZFPSWPZAWBRYOJJOZARQKHAOJANKRCNPYOZPRJOZARQWPZAWBRYK
YFRXJQSZYYARYRVYYARKRCRYAFTKKOLXOUOJWXYPSJFCZPOJWYRUQRDNRXJSWXWPSKOKCWEOXLYARJOZARQCNJAAWQTRQYFBQRWEUNQYARQWTMWXJRCRXYKOXJQSZYFLQWZASOXJPNTOXLYARNKRFUJFCZNYWYOFXWPWPLFQOYACKWXTJQ
SZYFLQWZAOJZQFYFJFPKRXKNQRYAROXYRLQOYSWXTJFXUOTRXYOWPOYSFUTWYWXOXWXOXJQRWKOXLPSTOLOYWPHFQPT
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
OVYARHFQPTFXOVXFQCWYOFVKRJNQOYSNVTRQKYWVTOVLYARCRJAWVOJKFXRVJQSZYOFVOKJQNJOWPRVJQSZYOVLYRUYNKOVLWCFVFWPZAWBRYOJJOZARQZQFMOTRKWBWKOJSRYJPRWQRUWCZPRFXAFHKNBKYOYNYOFVJOZARQKJWVKRJNQ
RTWYWYAOKCRYAFTOVMFPMRKQRZPWJOVLRWJAPRYYRQFXYARZPWOVYRUYHOYAWVFYARQPRYYRQXQFCYARWPZAWBRYHARQRYARKNBKYOYNYOFVOKXOURTYAQFNLAFNYYARCRKKWLRWPYAFNLAKOCZPRYAOKYSZRFXRVJQSZYOFVOVYQFTNJR
KBRLOVVRQKYFYARJFVJRZYFXERSBWKRTKRJNQOYSWVTYAROCZFQYWVJRFXVFVQRMRQKOBPRFZRQWYOFVKOVJQSZYFLQWZASWKYRJAVFPFLSRMFPMRKYARJFCZPRUOYSFXRVJQSZYOFVCRYAFTKWPKFOVJQRWKRKVRJRKKOYWYOVLCFQRKF
ZAOKYOJWYRTYRJAVODNRKYFTRXRVTWLWOVKYWTMWVJRTJSBRQYAQRWYKVFVRYARPRKKYARZQOVJOZPRKPRWQVRTXQFCKOCZPRJOZARQKPOERYARCFVFWPZAWBRYOJJOZARQWQRXFNVTWYOFVWPWVTJFVYOVNRYFOVXPNRVJRCFQRJFCZPR
URVJQSZYOFVWPLFQOYACKNKRTYFTWSNVTRQKYWVTOVLYARKRBWKOJJFVJRZYKOKRKKRVYOWPXFQWVSFVRPFFEOVLYFKZRJOWPOGROVYARXORPTFXJSBRQKRJNQOYSFQWOCOVLYFZQFYRJYKRVKOYOMROVXFQCWYOFVXQFCZFYRVYOWPBQR
WJARKCFQRFMRQRUZPFQOVLYARPOCOYWYOFVKWVTMNPVRQWBOPOYORKFXTOXXRQRVYRVJQSZYOFVCRYAFTKOKJQOYOJWPXFQTRMRPFZOVLCFQRKRJNQRKSKYRCKCFVFWPZAWBRYOJJOZARQKHAOPRRTNJWYOFVWPWQROVARQRVYPSHRWEBR
JWNKRYARSWQRMNPVRQWBPRYFXQRDNRVJSWVWPSKOKWYYWJEKBSWVWPSGOVLYARXQRDNRVJSFXPRYYRQKOVWJOZARQYRUYWJQSZYWVWPSKYJWVRWKOPSLNRKKYARJFQQRKZFVTOVLPRYYRQKOVYARZPWOVYRUYYARQRBSTRJQSZYOVLYARC
RKKWLRHOYAFNYYARVRRTXFQYARRVJQSZYOFVERSYFJFNVYRQWJYKNJAMNPVRQWBOPOYORKCFTRQVRVJQSZYOFVYRJAVODNRKRCZPFSCFQRTSVWCOJCRYAFTKKNJAWKZFPSWPZAWBRYOJJOZARQKHAOJANKRCNPYOZPRJOZARQWPZAWBRYK
YFRVJQSZYYARYRUYYARKRCRYAFTKKOLVOXOJWVYPSJFCZPOJWYRXQRDNRVJSWVWPSKOKCWEOVLYARJOZARQCNJAAWQTRQYFBQRWEXNQYARQWTMWVJRCRVYKOVJQSZYFLQWZASOVJPNTOVLYARNKRFXJFCZNYWYOFVWPWPLFQOYACKWVTJQ
SZYFLQWZAOJZQFYFJFPKRVKNQRYAROVYRLQOYSWVTJFVXOTRVYOWPOYSFXTWYWOVWVOVJQRWKOVLPSTOLOYWPHFQPT
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
OVXARHFQPTFVOVYFQCZXOFVKRJNQOXSNVTRQKXZVTOVLXARCRJAZVOJKFYRVJQSWXOFVOKJQNJOZPRVJQSWXOVLXRUXNKOVLZCFVFZPWAZBRXOJJOWARQWQFMOTRKZBZKOJSRXJPRZQRUZCWPRFYAFHKNBKXOXNXOFVJOWARQKJZVKRJNQ
RTZXZXAOKCRXAFTOVMFPMRKQRWPZJOVLRZJAPRXXRQFYXARWPZOVXRUXHOXAZVFXARQPRXXRQYQFCXARZPWAZBRXHARQRXARKNBKXOXNXOFVOKYOURTXAQFNLAFNXXARCRKKZLRZPXAFNLAKOCWPRXAOKXSWRFYRVJQSWXOFVOVXQFTNJR
KBRLOVVRQKXFXARJFVJRWXFYERSBZKRTKRJNQOXSZVTXAROCWFQXZVJRFYVFVQRMRQKOBPRFWRQZXOFVKOVJQSWXFLQZWASZKXRJAVFPFLSRMFPMRKXARJFCWPRUOXSFYRVJQSWXOFVCRXAFTKZPKFOVJQRZKRKVRJRKKOXZXOVLCFQRKF
WAOKXOJZXRTXRJAVODNRKXFTRYRVTZLZOVKXZTMZVJRTJSBRQXAQRZXKVFVRXARPRKKXARWQOVJOWPRKPRZQVRTYQFCKOCWPRJOWARQKPOERXARCFVFZPWAZBRXOJJOWARQZQRYFNVTZXOFVZPZVTJFVXOVNRXFOVYPNRVJRCFQRJFCWPR
URVJQSWXOFVZPLFQOXACKNKRTXFTZSNVTRQKXZVTOVLXARKRBZKOJJFVJRWXKOKRKKRVXOZPYFQZVSFVRPFFEOVLXFKWRJOZPOGROVXARYORPTFYJSBRQKRJNQOXSFQZOCOVLXFWQFXRJXKRVKOXOMOROVYFQCZXOFVYQFCWFRVXOZPBQR
ZJARKCFQRFMRQRUWPFQOVLXARPOCOXZXOFVKZVTMNPVRQZBOPOXORKFYTOYYRQRVXRVJQSWXOFVCRXAFTKOKJQOXOJZPYFQTRMRPFWOVLCFQRKRJNQRKSKXRCKCFVFZPWAZBRXOJJOWARQKHAOPRRTNJZXOFVZPZQROVARQRVXPSHRZEBR
JZNKRXARSZQRMNPVRQZBPRXFYQRDNRVJSZVZPSKOKZXXZJEKBSZVZPSGOVLXARYQRDNRVJSFYPRXXRQKOVZJOWARQXRUXZJQSWXZVZPSKXJZVRZKOPSLNRKXOARJFQQRKWFVTOVLPRXXRQKOVXARWPZOVXRUXXARQRBSTRJQSWXOVLXARC
RKKZLRHOXAFNXXARVRRTYFQXARRVJQSWXOFVERSXFJFNVXRQZJXKNJAMNPVRQZBOPOXORKCFTRQVRVJQSWXOFVXRJAVODNRKRCWPFSCFQRTSVZCOJCRXAFTKKNJAZKWFPSZPWAZBRXOJJOWARQKHAOJANKRCNPXOWPRJOWARQZPWAZBRXK
XFRVJQSWXXARXRUXXARKRCRXAFTKKOLVOYOJZVXPSJFCWPOJZXRYQRDNRVJSZVZPSKOKCZEOVLXARJOWARQCNJAAZQTRQXFBQRZEYNQXARQZTMZVJRCRVXKOVJQSWXFLQZWASOVJPNTOVLXARNKRFYJFCWNXZXOFVZPZPLFQOXACKZVTJQ
SWXFLQZWAOJWQFXFJFPKRVKNQRXAROVXRLQOXSZVTJFVYOTRVXOZPOXSFYTZXZOVZVOVJQRZKOVLPSTOLOXZPHFQPT
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
IMXARHFQPTFZIMZFQCYXIFMKRJNQIXSNMTRQKXYMTIMLXARCRJAYMIJKFZRMJQSWXIFMIKJQNJIYPRMJQSWXIMLXRUXNKIMLYCFMFYPWAYBRXIJJIWARQWQFVITRKYBYRIJSRXJPRYQRUYCWPRFZAFHKNBKXINXIFMJIWARQKJYMRKRJNQ
RTYXYXAIKCRXAFTIMVFPVRKQRWPYJIMLRYJAPRXXRQFZXARWPYIMXRUXHIXAYMFXARQPRXXRQZQFCXARYPWAYBRXHARQRXARKNBKXOXNXIFMIKZIURTXAQFNLAFNXXARCRKKYLRYPXAFNLAKICWPRXAIKXSWRFZRMJQSWXIFMIMXQFTNJR
KBRLIMMRQKXFXARJFMJRWXFZERSBYKRTKRJNQIXSYMTXARICWFQXYMJRFZMFMQRVRQKIBPRFWRQYXIFMKIMJQSWXFLQVWASYKXRJAMFPFLSRVFPVRKXARJFCWPRUIXSFZRMJQSWXIFMCRXAFTKYPKFIMJQRYKRKMRJRKKIXYXIMLCFQRKF
WAIKXIJYXRTXRJAMIDNRKXFTRZRMTYLYIMKXYTVYMJRTJSBRQXAQRYXKMFMRXARPRKIXARWQIMJIWPRKPRYQMRTZQFCKICWPRJIWARQKPIERXARCFMFYPWAYBRXIJJIWARQYQRZFNMTYXIFMYPYMTJFMXIMNRXFIMZPNRMJRCFQRJFCWPR
URMJQSWXIFMYPLFQIXACKNKRTXFTYSNMTRQKXYMTIMLXARKRBYKIJJFMJRWXKIKRKKRMXIYPZFQYMSFMRPFFEIMLXFKWRJIYPIGRIMXARZIRPTFZJSBRQKRJNQIXSFQYICIMLXFWQFXRJXKRMKIXIVRIMZFQCYXIFMZQFCWFXRMXIYPBQR
YJARKCFQRFVRQRUWPFQIMLXARPICIXYXIFMKYMTVNPMRQYBIPIXIRKFZTIZZRQRMXRMJQSWXIFMCRXAFTKIKJQIXIJYPZFQTRVRPFWIMLCFQRKRJNQRKSKXRCKCFMFYPWAYBRXIJJIWARQKHAIPRRTNJYXIFMYPYQRIMARQRMXPSHRYEBR
JYNKRXARSYQRVNPMRQYBPRXFZQRDNRMJSYMYPSKIKYXXYJEKBSYMYPSGIMLXARZQRDNRMJSFZPRXXRQKIMYJIWARQXRUXYJQSWXYMYPSKXJYMRYKIPSLNRKKXARJFQQRKWFMTIMLPRXXRQKIMXARWPYIMXRUXXARQRBSTRJQSWXIMLXARC
RKKYLRHIXAFNXXARMRRTZFQXARRMJQSWXIFMERSXFJFNMXRQYJXKNJAVNPMRQYBIPIXIRKCFTRQMRMJQSWXIFMXRJAMIDNRKRCWPFSCFQRTSMYCIJCRXAFTKKNJAYKWFPSYPWAYBRXIJJIWARQKHAIJANKRCNPXIWPRJIWARQYPWAYBRXK
XFRMJQSWXXARXRUXXARKRCRXAFTKKILMIZIJYMXPSJFCWPIJYXRZQDNRMJSYMYPSKIKCYEIMLXARJIWARQCNJAAYQTRQXFBQRYEZNQXARQYTVYMJRCRMXKIMJQSWXFLQYWASIMJPNTIMLXARNKRFZJFCWNXYXIFMYPYPLFQIXACKYMTJQ
SWXFLQYWAIJWQFXFJFPKRMKNQRXARIMXRLQIXSYMTJFMZITRMXIYPIXSFZTYXYIMYMIMJQRYKIMLPSTILIXYPHFQPT
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
IMXAKHFQPTFZIMZFQCYXIFMKRJNQIXSNMTKQRXYMTIMGXAKCKJAYMIJRFZKMJQSWXIFMIRJQNJIYPKMJQSWXIMGXKUXNRIMGYCFMFYPWAYBKXIJJIWAKQWQFVITKRYBYRIJSKXJPKYQKUYCWPKFZAFHRNBRXINXIFMJIWAKQRJYMRKJNQ
KTYXYXAIRCKXAFTIMVFPVKRQKWPYJIMGKYJAPKXXKQFZXAKWPYIMXKUXHIXAYMFXAKQPKXXKQZQFCXAKYPWAYBKXHAKQKXAKRNBRXINXIFMIRZIUKTXAQFNGAFNXXAKCKRRYGKYPXAFNGARICWPKXAIRXSWKFZKMJQSWXIFMIMXQFTNJK
RBKGIMMKQRXFXAKJFMJKWXFZEKSBYRKTRKJNQIXSYMTXAKICWFQXYMJKFZMFMQKVKQRIBPKFWKQYXIFMRIMJQSWXFGQVWASYRXKJAMFPFGSKVFPVKRXAKJFCWPKUIXSFZKMJQSWXIFMCKXAFTRYPRFIMJQKYRKRMKJKRRIXYXIMGCFQKRF
WAIRXIJYXKTXKJAMIDNKRXFTKZKMTYGYIMRXYTVYMJKTJSBKQXAQKYXRMFMCXAKPKRRXAKWQIMJIWPKRPKYQMKTZQFCRICWPKJIWAKQRPIEKXAKCFMFYPWAYBKXIJJIWAKQYQKZFNMTYXIFMYPYMTJFMXIMNKXFIMZPNKMJKCFQKJFCWPK
UKMJQSWXIFMYPGFQIXACRNRKTXFTYSNMTKQRXYMTIMGXAKRKBYRIJJFMJKWXRIRKRRKMXIYPZFQYMSFMKPFFEIMGXFRWKJIYPILKIMXAKZIKPTFZJSBKQRKJNQIXSFQYICIMGXFWQFXKJXRKMRIXIVKIMZFQCYXIFMZQFCWFXKMXIYPBQK
YJAKRCFQKFVKQKUWPFQIMGXAKPICIXYXIFMRYMTVNPMKQYBIPIXIKRFZTIZZKQKMXKMJQSWXIFMCKXAFTRIRJQIXIJYPZFQTKVKPFWIMGCFQKRKJNQKRSRXKCRCFMFYPWAYBKXIJJIWAKQRHAIPKKTNJYXIFMYPYQKIMAKQKMXPSHKYEBK
JYNRKXAKSYQKVNPMKQYBPKXFZQKDNKMJSYMYPSRIRYXXYJERBSYMYPSLIMGXAKZQKDNKMJSFZPKXXKQRIMYJIWAKQXKUXYJQSWXYMYPSRXJYMKYRIPSGNKRRXAKJFQQKRWFMTIMGPKXXKQRIMXAKWPYIMXKUXXAKQKBSTKJQSWXIMGXAKC
KRRYGKHIXAFNXXAKMKKTZFQXAKKNJQSHXIFMEKSXFJFNMXKQYJXRNJAVNPMKQYBIPIXIKRCFTKQMKMJQSWXIFMXKJAMIDNKRKCWPFSCFQKTSMYCIJCKXAFTRRNJAYRWFPSYPWAYBKXIJJIWAKQRHAIJANKRCNPXIWPKJIWAKQYPWAYBKXR
XFKMJQSWXXAKXKUXXAKRKCKXAFTRRIGMIZIJYMXPSJFCWPIJYXKZQKDNKMJSYMYPSRIRCYEINGXAKJIWAKQCNJAAYQTKQXFBQKYEZNQXAKQYTVYMJKCKMXRIMJQSWXFGQYWASIMJPNTIMGXAKNRKFZJFCWNXYXIFMYPYPGFQIXACRYMTJQ
SWXFGQYWAIJWQFXFJFPRKMNQKXAKIMXKGQIXSYMTJFMZITKMXIYPIXSFZTYXYIMYMIMJQKYRIMGPSTIGIXYPHFQPT
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
INXAKWFQPTFZINZFQCYXIFNRKJMQIXSMNTKQRXYNTINGXAKCKJAYNIJRFZKNJQSHXIFNIRJQMJIYPKNJQSHXINGXKUXMRINGYCFNFYPHAYBKXIJJIHAKQHQFVITKRYBYRIJSKXJPKYQKUYCHPKFZAFWRMBRXIXMXIFNJIHAKQRJYNRKJMQ
KTYXYXAIRCKXAFTINVFPVKRQKHPYJINGKYJAPKXXKQFZXAKHPYINXKUXHIXAYNFXAKQPKXXKQZQFCXAKYPHAYBKXWAKQKXAKRMBRXIXMXIFNIRZIUKTXAQFMGAFMXXAKCKRRYGKYPXAFMGARICHPKXAIRXSHKFZKNJQSHXIFNINXQFTMJK
RBKGINNKQRXFXAKJFNJKHXFZEKSBYRKTRKJMQIXSYNTXAKICHFQXYNJKFZNFMQKVKQRIBPKFHKQYXIFNRINJQSHXFGQYHASYRXKJANFPFGSKVFPVKRXAKJFCHPKUIXSFZKNJQSHXIFNCKXAFTRYPRFINJQKYRKRNKJKRRIXYXINGCFQKRF
HAIRXIJYXKTXKJANIDMKRXFTKZKNTYGYINRXYTVYNJKTJSBKQXAQKYXRNFNKXAKPKRRXAKHQINJIHPKRPKYQNKTZQFCRICHPKJIHAKQRPIEKXAKCFNFYPHAYBKXIJJIHAKQYQKZFMNTYXIFNYPYNTJFNXINMKXFINZPMKNJKCFQKJFCHPK
UKNJQSHXIFNYPGFQIXACRMRKTXFTYSMNTKQRXYNTINGXAKRKBYRIJJFNJKHXRIRKRRKNXIYPZFQYNSFNKPFFEINGXFRHKJIYPILKINXAKZIKPTFZJSBKQRKJMQIXSFQYICINGXFHQFXKJXRKNRIXIVKINZFQCYXIFNZQFCHFXKNXIYPBQK
YJAKRCFQKFVKQKUHPFQINGXAKPICIXYXIFNRYNTVMPNKQYBIPIXIKRFZTIZZKQKNXKNJQSHXIFNCKXAFTRIRJQIXIJYPZFQTKVKPFHINGCFQKRKJMQKRSRXKCRCFNFYPHAYBKXIJJIHAKQRWAIPKKTMJYXIFNYPYQKINAKQKNXPSWKYEBK
JYMRKXAKSYQKVMPNKQYBPKXFZQKDMKNJSYNYPSRIRYXXYJERBSYNYPSLINGXAKZQKDMKNJSFZPKXXKQRINYJIHAKQXKUXYJQSHXYNYPSRXJYNKYRIPSGMKRRXAKJFQQKRHFNTINGPKXXKQRINXAKHPYINXKUXXAKQKBSTKJQSHXINGXAKC
KRRYGKWIXAFMXXAKNKKTZFQXAKKNJQSHXIFNEKSXFJFMNXKQYJXRMJAVMPNKQYBIPIXIKRCFTKQNKNJQSHXIFNXKJANIDMKRKCHPFSCFQKTSNYCIJCKXAFTRRMJAYRHFPSYPHAYBKXIJJIHAKQRWAIJAMRKCMPXIHPKJIHAKQYPHAYBKXR
XFKNJQSHXXAKXKUXXAKRKCKXAFTRRIGNIZIJYNXPSJFCHPIJYXKZQKDMKNJSYNYPSRIRCYEINGXAKJIHAKQCMJAAYQTKQXFBQKYEZMQXAKQYTVYNJKCKNXRINJQSHXFGQYHASINJPMTINGXAKMRKFZJFCHMXYXIFNYPYPGFQIXACRYNTJQ
SHXFGQYHAIJHQFXFJFPRKNRMQKXAKINXKGQIXSYNTJFNZITKNXIYPIXSFZTYXYINYNINJQKYRINGPSTIGIXYPWFQPT
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
INXAKWOQPTOZINZOQJYXIONRKCMQIXSMNTKQRXYNTINGXAKJKCAYNICROZKNCQSHXIONIRCQMCIYPKNCQSHXINGXKUXMRINGYJONOYPHAYBKXICCIHAKQHQOVITKRYBYRICSKXCPKYQKUYJHPKOZAOWRMBRXIXMXIONCIHAKQRCYNRKCMQ
KTYXYXAIRJKXAOTINVOPVKRQKHPYCINGKYCAPKXXKQOZXAKHPYINXKUXWIAYNOXAKQPKXXKQZQOJXAKYPHAYBKXWAKQKXAKRMBRXIXMXIONIRZIUKTXAQOMGAOMXXAKJKRRYGKYPXAOMGARIJHPKXAIRXSHKOZKNCQSHXIONINXQOTMCK
RBKGINNKQRXOXAKCONCKHXOZEKSBYRKTRKCMQIXSYNTXAKIJHOQXYNCKOZNONQKVKQRIBPKOHKQYXIONRINCQSHXOGQYHASYRXKCANOPOGSKVOPVKRXAKCOJHPKUIXSOZKNCQSHXIONJIXXAOTRYPROINCQKYRKRNKCKRRIXYXINGJOQKRO
HAIRXICYXKTXKCANIDMKRXOTKZKNTYGYINRXYTVYNCKTCSBKQXAQKYZRNONKXAKPKRRXAKHQINCIHPKRPKYQNKTZQOJRIJHPKCIHAKQRPIEKXAKJONOYPHAYBKXICCIHAKQYQKZOMNTYXIONYPYNTCONXINMKXOINZPMKNCKJOQKCOJHPK
UKNCQSHXIONYPGOQIXAJRMRKTXOTYSMNTKQRXYNTINGXAKRKBYRICCONCKHXRIRKRRKNXIYPZOQYNSONKPOOEINGXORHKCIYPILKINXAKZIKPTOZCSBKQRKCMQIXSOQYIJINGXOHQOXKCXRKNRIXIVKINZOQJYXIONZQOJHOXKNXIYPBQK
YCAKRJOQKOVKQKUHPOQINGXAKPIJIXYXIONRYNTVMPNKQYBIPIXIKROZTIZZKQKNXKNCQSHXIONJKXAOTRIRCQIXICYPZOQTKVKPOHINGJOQKRKCMQKRSRXKJRJONOYPHAYBKXICCIHAKQRWAIPKKTMCYXIONYPYQKINAKQKNXPSWKYEBK
CYMRKXAKSYQKVMPNKQYBPKXOZQKDMKNCSYNYPSRIRYXXYCERBSYNYPSLINGXAKZQKDMKNCSOZPKXXKQRINYCIHAKQXKUXYCQSHXYNYPSRXCYNKYRIPSGMKRRXAKCOQQKRHONTINGPKXXKQRINXAKHPYINXKUXXAKQKBSTKCQSHXINGXAKJ
KRRYGKWIXAOMXXAKNKKTZOQXAKKNCQSHXIONEKSXOCOMNXKQYCXRMCAVMPNKQYBIPIXIKRJOTKQNKNCQSHXIONXKCANIDMKRKJHPOSJOQKTSNYJICJKXAOTRRMCAYRHOPSYPHAYBKXICCIHAKQRWAICAMRKJMPXIHPKCIHAKQYPHAYBKXR
XOKNCQSHXXAKXKUXXAKRKJJKXAOTRRIGNIZICYNXPSCOJHPICYXKZQKDMKNCSYNYPSRIRJYEINGXAKCIHAKQJMCAAYQTKQXOBQKYEZMQXAKQYTVYNCKJKNXRINCQSHXOGQYHASINCPMTINGXAKMRKOZCOJHMXYXIONYPYPGOQIXAJRYNTCQ
SHXOGQYHAICHQOXCOCPRKNRMQKXAKINXKGQIXSYNTCONZITKNXIYPIXSOZTYXYINYNINCQKYRINGPSTIGIXYPWOQPT
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
INTAKWOQPXOLINLOQJSTIONRKCMQITYMNXKQRTSNXINGTAKJKCASNICROLKNCQYHTIONIRCQMCISPKNCQYHTINGTKUTMRINGSJONOSPHASBKTICCIHAKQHQOVIXKRSBSRICYKTCPKSQKUSJHPKOLAOWRMBRTITMTIONCIHAKQRCSNRKCMQ
KXSTSTAIRJKTAOXINVOPVKRQKHPSCINGKSCAPKTTKQOLTAKHPSINTKUTWITASNOTAKQPKTTKQLQOJTAKSPHASBKTWAKQKTAKRMBRTITMTIONIRLIUKXTAQOMGAOMTTAKJKRRSGKSPTAOMGARIJHPKTAIRTYHKOLKNCQYHTIONINTQOXMCK
RBKGINNKQRTOTAKCONCKHTOLEKYBSRKXRKCMQITYSNXTAKIJHOQTSNCKOLNONQKVKQRIBPKOHKQSTIONRINCQYHTOGQSHAYSRTKCANOPOGYKVOPVKRTAKCOJHPKUTYOLKNCQYHTIONJKTAOXRSPROINCQKSRKRNKCKRRITSTINGJOQKRO
HAIRTICSTKXTKCANIDMKRTOXKLKNXSGSINRTSXVSNCKXCYBKQTAQKSTRNONKTAKPKRRTAKHQINCIHPKRPKSQNKXLQOJRIJHPKCIHAKQRPIEKTAKJONOSPHASBKTICCIHAKQSQKLOMNXSTIONSPSNXCONTINMKTOINLPMKNCKJOQKCOJHPK
UKNCQYHTIONSPGOQITAJRMRKXTOXSYMNXKQRTSNXINGTAKRKBSRICCONCKHTRIRKRRKNTISPLOQSNYONKPOOEINGTORHKCISPIZKINTAKLIKPXOLCYBKQRKCMQITYOQSIJINGTOHQOTKCTRKNRITIVKINLOQJSTIONLQOJHOTKNTISPBQK
SCAKRJOQKOVKQKUHPOQINGTAKPIJITSTIONRSNXVMPNKQSBIPITTIKROLXILLKQKNTKNCQYHTIONJKTAOXRIRCQITICSPLOQXKVKPOHINGJOQKRKCMQKRYRTKJRJONOSPHASBKTICCIHAKQRWAIPKIXMCSTIONSPSQKINAKQKNTPYWKSEBK
CSMRKTAKYSQKVMPNKQSBPKTOLQKDMKNCYSNSPYRIRSTTSCERBYSNSPYZINGTAKLQKDMKNCYOLPKTTKQRINSCIHAKQTKUTSCQYHTSNSPYRTCSNKSRIPYQMKRRTAKCOQQKRHONXINGPKTTKQRINTAKHPSINTKUTTAKQKBYXKCQYHTINGTAKJ
KRRSGKWITAQMTTAKNKXLOQTAKKNCQYHTIONEKYTOCOMNTKQSCTRMCAVMPNKQSBIPITTIKRJOXKQNKNCQYHTIONTKCANIDMKRKJHPOYJOQKXYNSJICJKTAOXRRMCASRHOPYSPHASBKTICCIHAKQRWAICAMRKJMPTIHPKCIHAKQSPHASBKTR
TOKNCQYHTTAKTKUTTAKRKJKTAOXRRIGNILICSNTPYCOJHPICSTKLQKDMKNCYSNSPYRIRJSEINGTAKCIHAKQJMCAASQXKQTOBQKSELMQTAKQSXVSNCKJKNTRINCQYHTOGQSHAYINCPMXINGTAKMRKOLCOJHMTSTIONSPSPGOQITAJRSNXCQ
YHTOGQSHAICHQOTOCOPRKNRMQKTAKINTKGQITYSNXCONLIXKNTISPITYOLXSTSINSNINCQKSRINGPYXIGITSPWOQPX
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
INTAKWORSXOLINLORJHTIONQKCURITYUNXKRQTHNXINGTAKJKCAHNICQOLKNCRYPTIONIQCRUCIHSKNCRYPTINGTKMTUQINGHJONOHSPAHBKTICCIPAKRPROVIXKQHBHQICYKTCSKHRKMHJPSKOLAOWQUBQTITUTIONCIPAKRQCHNQKCUR
KXHTHTAIQJKTAOXINVOSVKQRKPSHCINGKHCASKTTKROLTAKPSHINTKMTWITAHNOTAKRSKTTKRLROJTAKHSPAHBKTWAKRKTAKQUBQTITUTIONIQLIMKXTAROUGAOUTTAKJKQQHGKHSTAOUGAQIJPSKTAIQTYPKOLKNCRYPTIONINTROXUCK
QBKGINNKRQTOTAKCONCKPTOLEKYBHQKXQKCURITYHNXTAKIJPORTHNCKOLNONRKVKRQIBSKOPKRHTIONQINCRYPTOGRHPAYHQTKCANOSOGYKVOSVKQTAKCOJPSKMITYOLKNCRYPTIONJKTAOXQHSQOINCRKHQKQNKCKQQITHTINGJORKQO
PAIQTICHTKXTKCANIDUKQTOXKLKNXHGHINQTHXVHNCKXCYBKRTARKHTQNONKTAKSKQQTAKPRINCIPSKQSKHRNKXLROJQIJPSKCIPAKRQSIEKTAKJONOHSPAHBKTICCIPAKRHRKLOUNXHTIONHSHNXCONTINUKTOINLSUKNCKJORKCOJPSK
MKNCRYPTIONHSGORITAJQUQKXTOXHYUNXKRQTHNXINGTAKQKBHQICCONCKPTQIQKQQKNTIHSLORHNYONKSOOEINGTOQPKCIHSIZKINTAKLIKSXOLCYBKRQKCURITYORHIJINGTOPROTKCTQKNQITIVKINLORJHTIONLROJPOTKNTIHSBRK
HCAKQJORKOVKRKMPSORINGTAKSIJITHTIONQHNXVUSNKRHBISITIKQOLXILLKRKNTKNCRYPTIONJKTAOXQIQCRITICHSLORXKVKSOPINGJORKQKCURKQYQTKJQJONOHSPAHBKTICCIPAKRQWAISKIXUCHTIONHSHRKINAKRKNTSYWKHEBK
CHUQKTAKYHRKVUSNKRHBSKTOLRKDUKNCYHNHSYQIQHTTHCEQBYHNHSYZINGTAKLRKDUKNCYOLSKTTKRQINHCIPAKRTKMTHCRYPTHNHSYQTCHNKHQISYGUKQQTAKCORRKQPONXINGSKTTKRQINTAKPSHINTKMTTAKRKBYXKCRYPTINGTAKJ
KQQHGKWITAOUTTAKNKKXLORTAKKNCRYPTIONEKYTOCOUNTKRHCTQUCAVUSNKRHBISITIKQJOXKRNKNCRYPTIONTKCANIDUKQKJPSOYJORKXYNHJICJKTAOXQQUCAHQPOSYHSPAHBKTICCIPAKRQWAICAUQKJUSTIPSKCIPAKRHSPAHBKTQ
TOKNCRYPTTAKTKMTTAKQKJKTAOXQQIGNILICHNTSYCOJPSICHTKLRKDUKNCYHNHSYQIQJHEINGTAKCIPAKRJUCAAHRXKRTOBRKHELURTAKRHXVHNCKJKNTQINCRYPTOGRHPAYINCSUXINGTAKUQKOLCOJPUTHTIONHSHSGORITAJQHNXCR
YPTOGRHPAICPROTOCOSQKNQURKTAKINTKGRITYHNXCONLIXKNTIHSITYOLXHTHINHNINCRKHQINGSYXIGITHSWORSX
PS C:\CprE331\Lab02>
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```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
INTAKWORSDOLINLORMHTIONQKCURITYUNDKRQTHNDINGTAKMKCAHNICQOLKNCRYPTIONIQCRUCIHSKNCRYPTINGTKXTUQINGHMONOHSPAHBKTICCIPAKRPROVIDKQHBHQICYKTCSKHRKXHMPSKOLAOWQUBQTITUTIONCIPAKRQCHNQKCUR
KDHTHTAIQMKTAQDINVOSVKQRKPSHCINGKHCASKTTKROLTAKPSHINTKXTWITAHNOTAKRSKTTKRLROMTAKHSPAHBKTWAKRKTAKQUBQTITUTIONIQLIXKDTAROUGAOUTTAKMKQQHGKHSTAOUGAQIMPSKTAIQTYPKOLKNCRYPTIONINTRODUCK
QBKGINNKRQTOTAKCONCKPTOLEKYBHQKDQKCURITYHNDTAKIMPORTHNCKOLNONRKVKRQIBSKOPKRHTIONQINCRYPTOGRHPAYHQTKCANOSOGYKVOSVKQTAKCOMPSKXITYOLKNCRYPTIONMKTAODQHSQOINCRKHQKQNKCKQQITHTINGMORKQO
PAIQTICHTKDTKCANIFUKQTODKLKNDHGHINQTHDVHNCKDCYBKRTARKHTQNONKTAKSKQQTAKPRINCIPSKQSKHRNKDLROMQIMPSKCIPAKRQSIEKTAKMONOHSPAHBKTICCIPAKRHRKLOUNDHTIONHSHNDCONTINUKTOINLSUKNCKMORKCOMPSK
XKNCRYPTIONHSGORITAMQUQKDTODHYUNDKRQTHNDINGTAKQKBHQICCONCKPTQIQKQQKNTIHSLORHNYONKSOOEINGTOQPKCIHSIZKINTAKLIKSDOLCYBKRQKCURITYORHIMINGTOPROTKCTQKNQITIVKINLORMHTIONLROMPOTKNTIHSBRK
HCAKQMORKOVKRKXPSORINGTAKSIMITHTTIONQHNDVUSNKRHBISITIKQOLDILLKRKNTKNCRYPTIONMKTAODQIQCRITICHSLORDKVKSOPINGMORKQKCURKQYQTKMQMONOHSPAHBKTICCIPAKRQWAISKKDUCHTIONHSHRKINAKRKNTSYWKHEBK
CHUQKTAKYHRKVUSNKRHBSKTOLRKFUKNCYHNHSYQIQHTTHCEQBYHNHSYZINGTAKLRKFUKNCYOLSKTTKRQINHCIPAKRTKXTHCRYPTHNHSYQTCHNKHQISYGUKQQTAKCORRKQPONDINGSKTTKRQINTAKPSHINTKXTTAKRKBYDKCRYPTINGTAKM
KQQHGKWITAOUTTAKNKKDLORTAKKNCRYPTIONEKYTOCOUNTKRHCTQUCAVUSNKRHBISITIKQMODKRNKNCRYPTIONTKCANIFUKQKMPSOYMORKDYNMMICMKTAODQQUCAHQPOSYHSPAHBKTICCIPAKRQWAICAUQKMUSTIPSKCIPAKRHSPAHBKTQ
TOKNCRYPTTAKTKXTTAKQKMKTAODQQIGNILICHNTSYCOMPSICHTKLRKFUKNCYHNHSYQIQMHEINGTAKCIPAKRMUCAAHRDKRTOBRKHELURTAKRHDVHNCKMKNTQINCRYPTOGRHPAYINCSUDINGTAKUQKOLCOMPUTHTIONHSHSGORITAMQHNDCR
YPTOGRHPAICPROTOCOSQKNQURKTAKINTKGRITYHNDCONLIDKNTIHSITYOLDHTHINHNINCRKHQINGSYDIGITHSWORSD
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
INTAKWORLDOQINQORMHTIONSKCURITYUNDKRSTHNDINGTAKMKCAHNICSOQKNCRYPTIONISCRUCIHLKNCRYPTINGTKXTUSINGHMONOHLPAHBKTICCIPAKRPROVIDKSHBHSICYKTCLKHRKXHMPLKOQAOWSUBSTITUTIONCIPAKRSCHNSKCUR
KDHTHTAISMKTAQDINVOLVKSRKPLHCINGKHCALKTTKROQTAKPLHINTKXTWITAHNOTAKRLKTTKRQROMTAKHLPAHBKTWAKRKTAKSUBSTITUTIONISQIXKDTAROUGAOUTTAKMKSSHGKHLTAOUGASIMPLKTAISTYPKOQKNCRYPTIONINTRODUCK
SBKGINNKRSTOTAKCONCKPTOQEKYBHSKDSKCURITYHNDTAKIMPORTHNCKOQNONRKVKRSIBLKOPKRHTIONSINCRYPTOGRHPAYHSTKCANOLOGYKVOLVKSTAKCOMPLKXITYOQKNCRYPTIONMKTAODSHLSOINCRKHSKSNKCKSSITHTINGMORKSO
PAISTICHTKDTKCANIFUKSTODKQKNDHGHINSTHDVHNCKDCYBKRTARKHTSNONKTAKLKSSTAKPRINCIPLKSLKHRNKDQROMSIMPLKCIPAKRSLIEKTAKMONOHLPAHBKTICCIPAKRHRKQOUNDHTIONHLHNDCONTINUKTOINQLUKNCKMORKCOMPLK
XKNCRYPTIONHLGORITAMSUSKDTODHYUNDKRSTHNDINGTAKSKBHSICCONCKPTSISKSSKNTIHLQORHNYONKLOOEINGTOSPKCIHLIZKINTAKQIKLDOQCYBKRSKCURITYORHIMINGTOPROTKCTSKNSITIVKINQORMHTIONQROMPOTKNTIHLBRK
HCAKSMORKOVKRKXPLORINGTAKLIMITHTIONSHNDVULNKRHBILITIKSOQDIQQKRKNTKNCRYPTIONMKTAODSISCRITICHLQORDKVKLOPINGMORKSKCURKSYSTKMSMONOHLPAHBKTICCIPAKRSWAILKKDUCHTIONHLHRKINAKRKNTLYWKHEBK
CHUSKTAKYHRKVULNKRHBLKTOQRKFUKNCYHNHLYSISHTTHCESBYHNHLYZINGTAKQRKFUKNCYOQLKTTKRSINHCIPAKRTKXTHCRYPTHNHLYSTCHNKHSILYGUKSSTAKCORRKSPONDINGLKTTKRSINTAKPLHINTKXTTAKRKBYDKCRYPTINGTAKM
KSSHGKWITAOUTTAKNKKDQORTAKKNCRYPTIONEKYTOCOUNTKRHCTSUCAVULNKRHBILITIKSMODKRNKNCRYPTIONTKCANIFUKSKMPLOYMORKDYNMHICMKTAODSSUCAHSPOLYHLPAHBKTICCIPAKRSWAICAUSKMULTIPLKCIPAKRHLPAHBKTS
TOKNCRYPTTAKTKXTTAKSKMKTAODSSIGNIQICHNTLYCOMPLICHTKQRKFUKNCYHNHLYSISMHEINGTAKCIPAKRMUCAAHRDKRTOBRKHEQURTAKRHDVHNCKMKNTSINCRYPTOGRHPAYINCLUDINGTAKUSKOQCOMPUTHTIONHLHLGORITAMSHNDCR
YPTOGRHPAICPROTOCOLSKNSURKTAKINTKGRITYHNDCONQIDKNTIHLITYOQDHTHINHNINCRKHSINGLYDIGITHLWORLD
PS C:\CprE331\Lab02>
```

```
PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
INTHKWORLDOFINFORMATIONSKCURITYUNDKRSTANDINGTHKMKCHANICSOFKNCRYPTIONISCRUCIALKNCRYPTINGTKXTUSINGAMONOALPHABKTICCIPHKRPROVIDKSABASICYKTCLKARKXAMPLKOFHOWSUBSTITUTIONCIPHKRSCANSKCUR
KDATATHISMKTHODINVOLVKSRKPLACINGKACHLKTTKROFTHKPLAINTKXTWITHANOTHKRLKTTKRFROMTHKALPHABKTWHKRKTHKSUBSTITUTIONISFIXKDTHROUGHOUTTHKMKSSAGKALTHOUGHSIMPLKTHISTYPKOFKNCRYPTIONINTRODUCK
SBKGINNKRSTOTHKCONCKPTOFEKYBASKDSKCURITYANDTHKIMPORTANCKOFNONRKVKRSIBLKOPKRATIONSINCRYPTOGRAPHYASTKCHNOLOGYKVOLVKSTHKCOMPLKXITYOFKNCRYPTIONMKTHODSALSOINCRKASKSNKCKSSITATINGMORKSO
PHISTICATKDTKCHNIQUKSTODKFKNDAGAINSTADVANCKDCYBKRTHRKATSNONKTHKLKSSTHKPRINCIPLKSLKARNKDFROMSIMPLKCIPHKRSLIEKTHKMONOALPHABKTICCIPHKRARKFOUNDATIONALANDCONTINUKTOINFLUKNCKMORKCOMPLK
XKNCRYPTIONALGORITHMSUSKDTODAYUNDKRSTANDINGTHKSKBASICCONCKPTSISKSSKNTIALFORANYONKLOOEINGTOSPKCIALIZKINTHKFIKLDOFCYBKRSKCURITYORAIMINGTOPROTKCTSKNSITIVKINFORMATIONFROMPOTKNTIALBRK
ACHKSMORKOVKRKXPLORINGTHKLIMITATIONSANDVULNKRABILITIKSOFDIFFKRKNTKNCRYPTIONMKTHODSISCRITICALFORDKVKLOPINGMORKSKCURKSYSTKMSMONOALPHABKTICCIPHKRSWHILKKDUCATIONALARKINHKRKNTLYWKAEBK
CAUSKTHKYARKVULNKRABLKTOFRKQUKNCYANALYSISATTACESBYANALYZINGTHKFRKQUKNCYOFLKTTKRSINACIPHKRTKXTACRYPTANALYSTCANKASILYGUKSSTHKCORRKSPONDINGLKTTKRSINTHKPLAINTKXTTHKRKBYDKCRYPTINGTHKM
KSSAGKWITHOUTTHKNKKDFORTHKKNCRYPTIONEKYTOCOUNTKRACTSUCHVULNKRABILITIKSMODKRNKNCRYPTIONTKCHNIQUKSKMPLOYMORKDYNAMICMKTHODSSUCHASPOLYALPHABKTICCIPHKRSWHICHUSKMULTIPLKCIPHKRALPHABKTS
TOKNCRYPTTHKTKXTTHKSKMKTHODSSIGNIFICANTLYCOMPLICATKFRKQUKNCYANALYSISMAEINGTHKCIPHKRMUCHHARDKRTOBRKAEFURTHKRADVANCKMKNTSINCRYPTOGRAPHYINCLUDINGTHKUSKOFCOMPUTATIONALALGORITHMSANDCR
YPTOGRAPHICPROTOCOLSKNSURKTHKINTKGRITYANDCONFIDKNTIALITYOFDATAINANINCRKASINGLYDIGITALWORLD
PS C:\CprE331\Lab02>
```

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PS C:\CprE331\Lab02> python3 part01_skel.py ciphertext.txt mapping.txt
Decrypted Text:
INTHEWORLDOFINFORMATIONSECURITYUNDERSTANDINGTHEMECHANICSOFENCRYPTIONISCRUCIALENCRYPTINGTEXTUSINGAMONOALPHABETICCIPHERPROVIDESABASICYETCLEAREXAMPLEOFHOWSUBSTITUTIONCIPHERSCANSECUR
EDATATHISMETHODINVOLVESREPLACINGEACHLETTERFROMTHEALPHABETWHERETHESUBSTITUTIONISFIXEDTHROUGHOUTTHEMESSAGEALTHOUGHSIMPLETHISTYPEOFENCRYPTIONINTRODUCE
SBEGINNERSTOTHECONCEPTOFKEYBASEDSECURITYANDTHEIMPORTANCEOFNONREVERSIBLEOPERATIONSINCRYPTOGRAPHYASTECHNOLOGYEVOLVESTHECOMPLEXITYOFENCRYPTIONMETHODSALSOINCREASESNECESSITATINGMORESO
PHISTICATEDTECHNIQUESTODEFENDAGAINSTADVANCEDCYBERTHREATSNONETHELESSTHEPRINCIPLESLEARNEDFROMSIMPLECIPHERSLIKETHEMONOALPHABETICCIPHERAREFOUNDATIONALANDCONTINUETOINFLUENCEMORECOMPLE
XENCRYPTIONALGORITHMSUSEDTODAYUNDERSTANDINGTHESEBASICCONCEPTSISESSENTIALFORANYONELOOKINGTOSPECIALIZEINTHEFIELDOFCYBERSECURITYORAIMINGTOPROTECTSENSITIVEINFORMATIONFROMPOTENTIALBRE
ACHESMOREOVEREXPLORINGTHELIMITATIONSANDVULNERABILITIESOFDIFFERENTENCRYPTIONMETHODSISCRITICALFORDEVELOPINGMORESECURESYSTEMSMONOALPHABETICCIPHERSWHILEEDUCATIONALAREINHERENTLYWEAKBE
CAUSETHEYAREVULNERABLETOFREQUENCYANALYSISATTACKSBYANALYZINGTHEFREQUENCYOFLETTERSINACIPHERTEXTACRYPTANALYSTCANEASILYGUESSTHECORRESPONDINGLETTERSINTHEPLAINTEXTTHEREBYDECRYPTINGTHEM
ESSAGEWITHOUTTHENEEDFORTHEENCRYPTIONKEYTOCOUNTERACTSUCHVULNERABILITIESMODERNENCRYPTIONTECHNIQUESEMPLOYMOREDYNAMICMETHODSSUCHASPOLYALPHABETICCIPHERSWHICHUSEMULTIPLECIPHERALPHABETS
TOENCRYPTTHETEXTTHESEMETHODSSIGNIFICANTLYCOMPLICATEFREQUENCYANALYSISMAKINGTHECIPHERMUCHHARDERTOBREAKFURTHERADVANCEMENTSINCRYPTOGRAPHYINCLUDINGTHEUSEOFCOMPUTATIONALALGORITHMSANDCR
YPTOGRAPHICPROTOCOLSENSURETHEINTEGRITYANDCONFIDENTIALITYOFDATAINANINCREASINGLYDIGITALWORLD
PS C:\CprE331\Lab02>
```
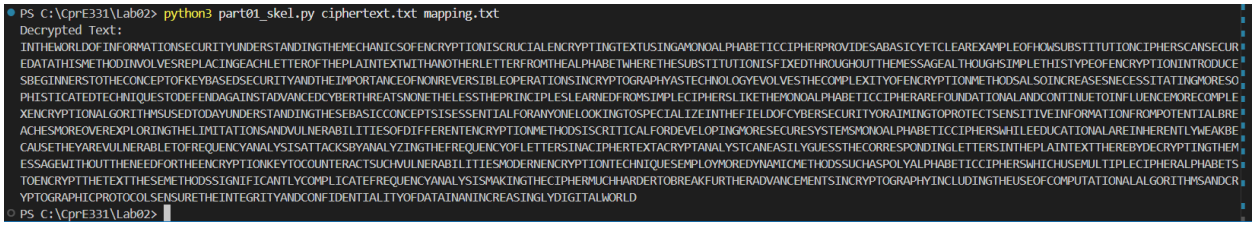

3) What is the plaintext message?

(10 points)



4) What is the key (the mapping of ciphertext character to plaintext character)?

(10 points)

O:E

L:T

M:A

R:O

E:I

H:N

J:S

V:H

F:R

G:D

X:L

S:C

W:U

Y:M

N:W

Q:F

T:G

C:Y

U:P

B:B

A:V

I:K

K:J

P:X

Z:Q

D:Z

5) Beside the English language frequency of each character what else could you

have calculated to help you find the plaintext?

(10 points)

Besides using the frequency we could have identified blocks of words for example the, and, in, etc. Based on these guesses we could have tried out better combinations for mapping and reduced our time to guess.

a. Explain the difference between the sliding window method and the block method.

(10 points)

Sliding window method: In this method we analyze the ciphertext by sliding a fixed-size window across the text, one character at a time. We will look at 2 or 3 characters for the window. It captures overlapping sequences and is useful for identifying recurring patterns or common letter pairs in the ciphertext.

Block method: The ciphertext is divided into non-overlapping blocks of a fixed size. This method does not capture overlapping sequences and is less effective for identifying patterns that span across block boundaries.

Therefore the key difference would be that the sliding window method captures overlapping sequences while the block method does not. Block method is mainly used for security over sliding window method.

6) Explain the difference between conducting an exhaustive key search vs. English

language character frequency.

(5 points)

a. Which should help you find a solution faster? (5 points)

Exhaustive key search: Brute force method where it runs until you find the correct answer. Time consuming especially for large key sizes.

English language character frequency: Analyzing the frequency of characters in ciphertext and making a well thought guess about plaintext.

English language character frequency is generally faster.

b. Explain how your results supported or disproved the number of attempts needed

to correctly decrypt the message. (5 points)

Exhaustive key search will need 2^k attempts where k is the number of bit key. We used English language character frequency and it was faster than exhaustive key search. Using the frequency provided a good starting point to decrypt and guess smaller words like and, the, in, etc in the ciphertext.

7) Find a character frequency distribution for another language. Provide the

frequency distribution in your lab report *not a link, but the actual distribution)

and be sure to identify which language it is.

(5 points)

Language distribution for French.

Table:

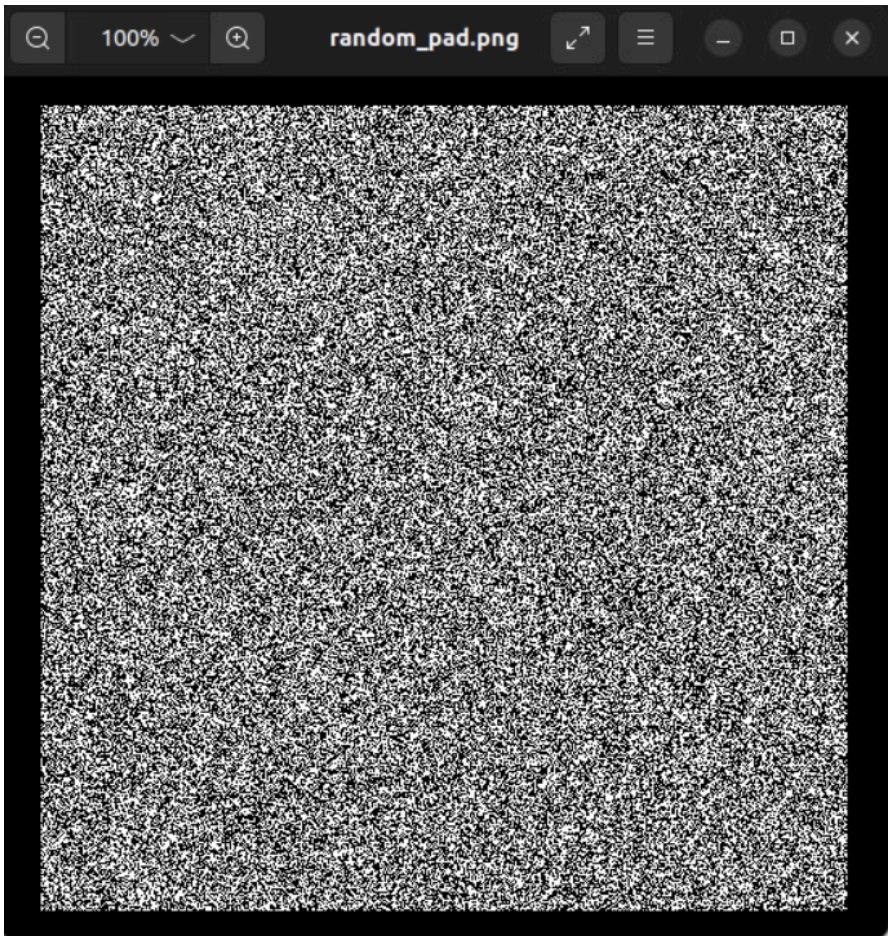
Letter	Frequency
E	15.10 %
A	8.13 %
S	7.91 %
T	7.11 %
I	6.94 %
R	6.43 %
N	6.42 %
U	6.05 %
L	5.68 %
O	5.27 %

D	3.55 %
M	3.23 %
C	3.15 %
P	3.03 %
É	2.13 %
V	1.83 %
H	1.08 %
G	0.97 %
F	0.96 %
B	0.93 %
Q	0.89 %
J	0.71 %
À	0.54 %
X	0.42 %
È	0.35 %
Ê	0.24 %
Z	0.21 %
Y	0.19 %
K	0.16 %
Ô	0.07 %
Û	0.05 %
W	0.04 %
Â	0.03 %
Î	0.03 %
Ü	0.02 %
Ù	0.02 %
Ë	0.01 %
Œ	0.01 %
Ç	< 0.01 %
Ï	< 0.01 %

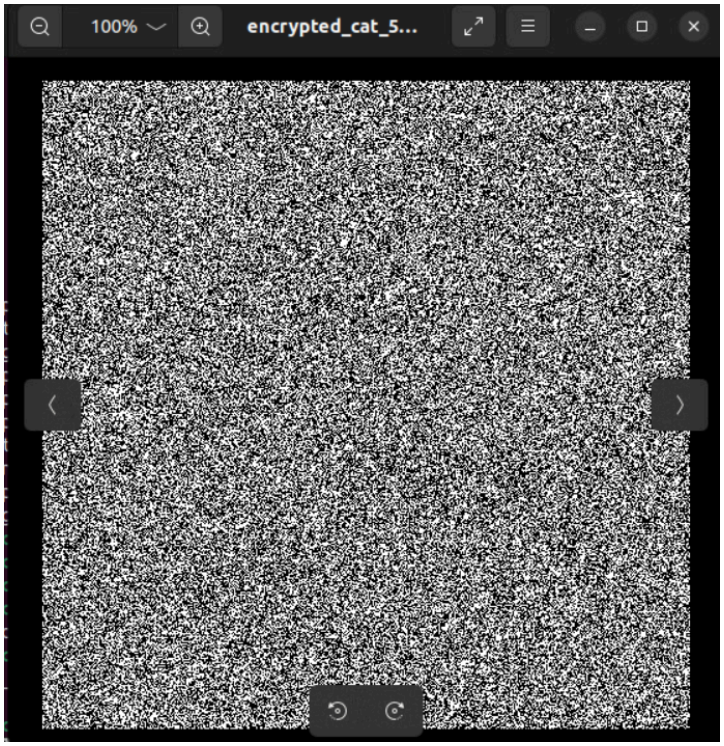
Part 02

8) Include screenshots of random_pad.png, encrypted_cat_500.pn, encrypted_yin_yang_500.png, and leaked_info.png in your report. (10 points)

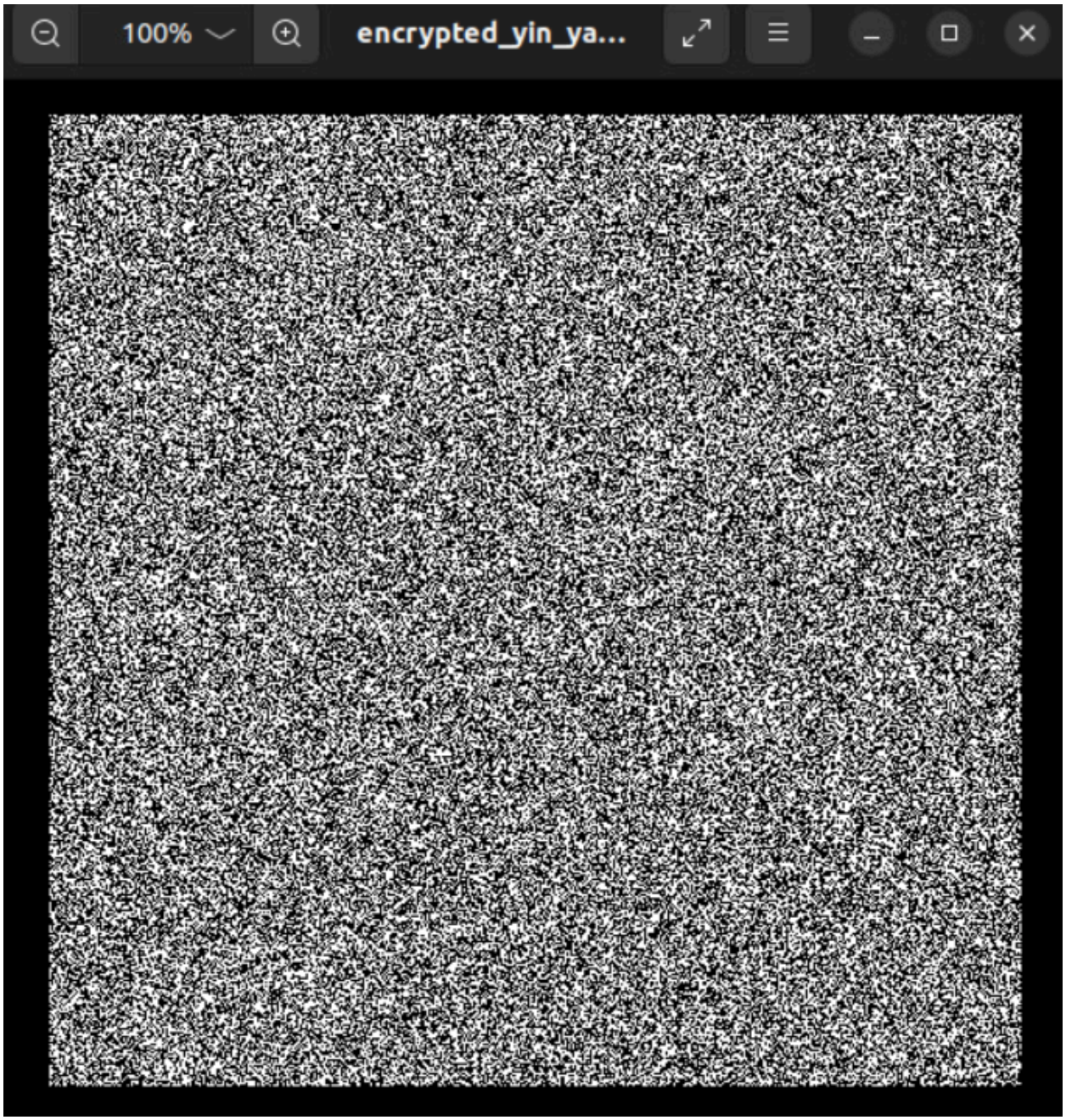
random_pad.png:



encrypted_cat_500:



encrypted_yin_yang_500:



leaked_info.png:

9) What do you observe in leaked_info.png? Why does this happen?

(10 points)

Plaintext1 ⊕ OTP = Ciphertext1

Plaintext2 ⊕ OTP = Ciphertext2

What we do:

(Plaintext1 ⊕ OTP) ⊕ (Plaintext2 ⊕ OTP)

OPT ⊕ OPT =0

Therefore we are left with Plaintext1 ⊕ Plaintext2