**Level 1: Red Pill, Blue Pill**

**Decode the following message:**

Ymnx nx dtzw qfxy hmfshj. Fkyjw ymnx, ymjwj nx st yzwsnsl gfhp.

Dtz yfpj ymj gqzj unqq—ymj xytwd jsix, dtz bfpj zu ns dtzw gji fsi gjqnjaj bmfyjajw dtz bfsy yt gjqnjaj.

Dtz yfpj ymj wji unqq—dtz xyfd ns Btsijwqfsi, fsi N xmtb dtz mtb ijju ymj wfggny mtqj ltjx.

Wjrjrgjw: fqq N'r tkkjwnsl nx ymj ywzym. Stymnsl rtwj.

Hint #1: The code is a simple letter shift cypher

Hint #2: <http://practicalcryptography.com/ciphers/simple-substitution-cipher/>

* What single letter is always capitalized?
* Identify the 2 letter words and use the “frequency analysis” tables
* Identify the most common letters and use the “frequency analysis” tables

Final Hint / Solution:

* <https://www.youtube.com/watch?v=ytftrd6rxps>

Final Question:

* What is the shift amount? How many letters is the coded message shifted by?

**Write the Decoded Message below:**

The dialogue from the famous movie “Matrix:

This your last chance. After this there is no turning back. You take the blue pill, the story ends. You wake up in your bed and believe whatever you want to. You take the red pill, you stay in Wonderland, and I show you how deep the rabbit hole goes. Remember, all I'm offering is the truth. Nothing more.

**Level 2: ASCII Code**

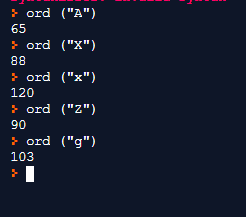
1. What does the ASCII acronym stand for?

Stands for American Standard Code for Information Interchange.

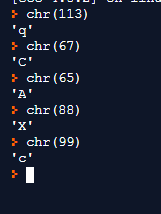
1. What is ASCII code used for?

Designed for use with teletypes, and so the descriptions are somewhat obscure and their use is frequently not as intended. Used for representing 128 English characters as number. The English characters will be assigned with a number between 0-127. Extra characters within the code are mathematical integers, graphics and many others. Most ASCII codes are used for text messages and can transfer data between many different computers using the code. There is also an extended ASCII code which includes more symbols like non-English characters or mathematical symbols. The code offered the advantage of compatibility and allowed printers and terminals. All computer data are only just numbers and every character represents a stored number.

1. **Why can’t computers just use the letters we type or the letters used by humans when we write things down?**  
     
   Computers are only coded in the numbers of 1 and 0 and can only interpret numbers or integers in order to operate.
2. **Write a Python program that uses the ord() function to convert some text letters into ASCII code numbers. Print the numbers to the console screen. Provide your program listing below.**



1. **Write a Python program that uses the chr() function to convert some ASCII code numbers into text letters. Print the letters to the console screen. Provide your program listing below.**



**Level 3: Coding Program**

Work with a partner to create a program to encrypt and decrypt messages using a numerical code.

1. To encrypt the message your program should do the following:
   1. Read a message contained in a text file
   2. Convert the text characters (letters in the words) in the text file to ASCII numbers using the ord() function
   3. Modify the ASCII numbers using a mathematical function (e.g. addition or multiplication)
   4. Write the modified ASCII numbers to a binary file
   5. The binary file is your encrypted message
2. To decrypt your message your program should do the following:
   1. Read the encrypted message contained in the binary file
   2. Convert the modified numbers to ASCII numbers using a reverse mathematical function (e.g. subtraction or division)
   3. Convert the ASCII numbers to text characters using the chr() functions
   4. Write the text characters to a text file
   5. The text file is your decrypted file.
3. Demo your program to Mr. Nestor
4. Provide a listing of the following:
   1. Your encryption program
   2. Your decryption program
   3. The contents of your original message text file
   4. A dump of the contents of your binary encrypted file
   5. The contents of your decrypted message text file
5. def Encryption(Message,EncryptedObject):
6. Message = open(Message,'r')
7. Message\_Read = Message.read()
8. number = 0
9. EncryptedFile = open(EncryptedObject,'ab')
10. while True:
11. messageORD = ord(Message\_Read[number])
12. ENCRYPT = messageORD\*2-5
13. byteAdded = bytearray(b'\x00')
14. byteAdded[0] = ENCRYPT
15. print(Message\_Read[number], messageORD, ENCRYPT)
16. EncryptedFile.write(byteAdded)
17. number = number+1
18. if number > 130:
19. break;
20. EncryptedFile.close
21. Message.close
22. def Decrytion(EncryptedObject,DecoddedMessage):
23. EncryptedFile = open(EncryptedObject,'rb')
24. Decodded = open(DecoddedMessage, 'a')
25. Anumber = 0
26. encryptedObject = EncryptedFile.read()
27. while True:
28. NeedTOdecrypt = encryptedObject[Anumber]
29. Decrypted = int((NeedTOdecrypt+5)/2)
30. MessageDecrypted = chr(Decrypted)
31. Decodded.write(MessageDecrypted)
32. print(encryptedObject[Anumber],NeedTOdecrypt,Decrypted, MessageDecrypted)
34. Anumber = Anumber+1
35. if Anumber > 130:
36. break;
37. EncryptedFile.close()
38. Decodded.close()
39. Encryption('R/CodedMessage.txt','R/Encrypted.bin')
40. Decrytion('R/Encrypted.bin','R/Decodded.txt')

Files:

**CodedMessage.txt-** Hello baljit, come to school I have something very interesting to tell you. Meet me at our secret location without anyone knowning.

**Decodded.txt**

**Encrypted.bin**