**Level 1: Basic ASCII Coding**

1. Research the "ASCII Code"
   1. Explain what ASCII stands for.

ASCII stands for American Standard Code for Information Interchange.

* 1. Explain how to convert a letter into an ASCII coded number

First you look for the letter in the ASCII column and then look at the row moving left and then you will find the corresponding number.

* 1. Explain how to de-code an ASCII number into a letter

For example the number is 82 you look for it in the chart. Then you look at the very end of the row which will have the letter in this case the letter for 82 is R.

1. Open a new Python Repl and run the sample program provided at the end of this module.
   1. Briefly summarize what the "asciiCodes" list does

The “asciiCodes” list converts the letters into ASCII numbers.

* 1. Briefly summarize what the "textCoder" function does

The “testCoder” function turns your letters into a coded string.

* 1. Briefly summarize what the "textDeCoder" function does

The “textDeCoder” turns the coded string back to letters

* 1. Briefly summarize what the main program code does

The main program code asks the user for a password and then converts it into a coded string then asks to enter a coded password decode and then displays the original set of letters the user gave.

1. Explain the main limitation of the program.

The main limitation of the program is that there aren’t many letters to convert into numbers because you only have 4 letters available. All other letters will be shown as 000 in the coded string.

**Level 2: Extending The Program**

1. Modify the sample program to do the following (Still using the ASCII code):
   1. Code all of the uppercase and lower case letters
   2. Code the digits 0 to 9
   3. Code at least 5 special characters (e.g. "1?$%&")
2. Verify that your program works for ***coding*** a message containing all of the basic and special characters.
   1. Provide a sample of your program output below.

Enter a password to code.

password: ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!%&?@Coded string is: 065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080 081 082 083 084 085 086 087 088 089 090 097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 048 049 050 051 052 053 054 055 056 057 033 037 038 063 064

1. Verify that your program works for ***de-coding*** a message containing all of the basic and special characters.
   1. Provide a sample of your program output below.

Enter a coded password to decode

(or return to use the Coded string)

Code:

DeCoded string is: ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!%&?@

1. List your program modifications below:

asciiCodes = [("A",65),("B",66),("C",67),("D",68),("E",69),("F",70),("G",71),("H",72),("I",73),("J",74),("K",75),("L",76),("M",77),("N",78),("O",79),("P",80),("Q",81),("R",82),("S",83),("T",84),("U",85),("V",86),("W",87),("X",88),("Y",89),("Z",90),]

asciiCodes += [("a",97),("b",98),("c",99),("d",100),('e', 101),('f', 102),('g', 103),('h', 104),('i', 105),('j', 106),('k', 107),('l', 108),('m', 109),('n', 110),('o', 111),('p', 112),('q', 113),('r', 114),('s', 115),('t', 116),('u', 117),('v', 118),('w', 119),('x', 120),('y', 121),('z', 122),]

asciiCodes +=[("0",48),("1",49),("2",50),("3",51),("4",52),("5",53),("6",54),("7",55),("8",56),("9",57),]

asciiCodes +=[("!",33),("%",37),("&",38),("?",63),("@",64),]

**Level 3: Creating A Secret Code**

1. Modify the sample program to create your own secret code that is different from the ASCII code:
   1. Work with a partner to create a secret code that codes letters and characters into different letters and characters.
   2. Your program should be able to create a coded message that   
      you can give to your partner
   3. Your program should be able to de-code a coded message that   
      you get from your partner
2. Provide a sample of your program output below.
   1. Show how your program codes a secret message

Enter a password to code.

password: A

Coded string is: F

* 1. Show how your program de-codes a secret message

Enter a coded password to decode

(or return to use the Coded string)

Code:

DeCoded string is: A

1. List your program modifications below:

"""

This program is currently immited to converting only the

characters "ABCD" and "abcd". The "asciiCodes" list can be easily

extended to include more letters and special characters.

This program currently uses the ASCII codes for converting text.

You can easily create your own secret code by changing the numbers

in the "asciiCodes" list.

"""

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

asciiCodes += [("a",'l'),("b",'m'),("c",'n'),("d",'o'),('e','p'),('f','q'),('g','r'),('h','s'),('i','t'),('j','u'),('k','v'),('l','w'),('m','x'),('n','y'),('o','z'),('p','a'),('q','b'),('r','c'),('s','d'),('t','e'),('u','f'),('v','g'),('w','h'),('x','i'),('y','j'),('z','k'),]

# This function codes the specified textChar into a

# three digit number padded with zeroes

def textCoder(textChar) :

for textCode in asciiCodes :

if (textCode[0] == textChar) :

return textCode[1]

def textDeCoder (codedChar) :

if (codedChar == "") or (codedChar == "000") :

return " "

for textCode in asciiCodes :

if (textCode[1] == (codedChar)) :

return textCode[0]

return " "

# MAIN PROGRAM CODE STARTS HERE

print("Enter a password to code.")

textIn = input("password: ")

codeOut = ""

for textChar in textIn :

codedChar = textCoder(textChar)

codeOut = codeOut + codedChar + " "

#print("char: ",textChar," ASCII Coded char: ", codedChar)

print("Coded string is: ",codeOut)

print(" ")

print("Enter a coded password to decode")

print("(or return to use the Coded string)")

codeIn = input("Code: ")

if codeIn == "" :

codeIn = codeOut

codeList = codeIn.split(" ")

textOut = ""

for codedChar in codeList :

if (codedChar != "") :

textChar = textDeCoder(codedChar)

textOut += textChar

#print("ASCII Coded char: ", codedChar," decoded char: ",textChar)

print("DeCoded string is: ",textOut)

**Appendix: Sample Program**

"""

This program is currently Limited to converting only the

characters "ABCD" and "abcd". The "asciiCodes" list can be easily

extended to include more letters and special characters.

This program currently uses the ASCII codes for converting text.

You can easily create your own secret code by changing the numbers

in the "asciiCodes" list.

"""

asciiCodes = [("A",65),("B",66),("C",67),("D",68)]

asciiCodes += [("a",97),("b",98),("c",99),("d",100)]

# This function codes the specified textChar into a

# three digit number padded with zeroes

def textCoder(textChar) :

for textCode in asciiCodes :

if (textCode[0] == textChar) :

return format(textCode[1],'03')

return "000"

def textDeCoder (codedChar) :

if (codedChar == "") or (codedChar == "000") :

return " "

for textCode in asciiCodes :

if (textCode[1] == int(codedChar)) :

return textCode[0]

return " "

# MAIN PROGRAM CODE STARTS HERE

print("Enter a password to code.")

textIn = input("password: ")

codeOut = ""

for textChar in textIn :

codedChar = textCoder(textChar)

codeOut = codeOut + codedChar + " "

#print("char: ",textChar," ASCII Coded char: ", codedChar)

print("Coded string is: ",codeOut)

print(" ")

print("Enter a coded password to decode")

print("(or return to use the Coded string)")

codeIn = input("Code: ")

if codeIn == "" :

codeIn = codeOut

codeList = codeIn.split(" ")

textOut = ""

for codedChar in codeList :

if (codedChar != "") :

textChar = textDeCoder(codedChar)

textOut += textChar

#print("ASCII Coded char: ", codedChar," decoded char: ",textChar)

print("DeCoded string is: ",textOut)