**Level 1: Basic ASCII Coding**

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

American Standard Code for Information Interchange

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

Press and hold ALT while typing the character code. Example to insert degree symbol, press and hold ALT while typing 0176. Another example is if you hold ALT, and press a random number combination, something can pop up.

ALT + 550 = Ȧ

ALT + 0255 = ÿ

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

Ex:

what are you = 119 104 097 116 032 097 114 101 032 121 111 117

Another example:

HELLO = 072 069 076 076 079

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 program uses the code to convert to text

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

The function codes the specified textChar into a 3 digit number padded with zeroes

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

Helps support the textCorder

* 1. Briefly summarize what the main program code does

It tells you to enter a password to code and then tells you to enter a code to decode it or it tells you to return to use the coded string. Lastly, it will tell you the decoded string is.

1. Explain the main limitation of the program.

You can only use letters a b c d and capital ABCD. If you want to, the list can be extended to use more letters and numbers. If you don’t use those letters, it will say 000.

**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

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),]

* 1. Code the digits 0 to 9

ALT 048 = 0

ALT 049 = 1

ALT 050 = 2

ALT 051 = 3

ALT 052 = 4

ALT 053 = 5

ALT 054 = 6

ALT 055 = 7

ALT 056 = 8

ALT 057 = 9

* 1. Code at least 5 special characters (e.g. "1?$%&")

("☺",1),("☻",2),("♥",3),("♦",4),("♣",5),

1. 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.
2. 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.
3. 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",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),("048",048),("049",049),]

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),("☺",1),("☻",2),("♥",3),("♦",4),("♣",5),]

# 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)

**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
   2. Show how your program de-codes a secret message
3. List your program modifications below:

**Appendix: Sample Program**

"""

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",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)