**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**

Each letter holds a specific number that represents it (ex. !=33, k=107). Each letter can be converted into decimal, oct, or hex. To convert a letter to a coded number, you would match the letter with the corresponding letter and keep going until you have what you need.

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

You do the opposite of converting letters into a number code. Instead you would match each number up with the corresponding letter.

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 converts numbers into the letters and the letters into the number code. The only letters available are A-D and a-d so if there is a letter that isn’t one of those 4, it puts it at 000. If all the letters were completed a-z, then the user can enter any code using the letters.

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

For the textCoder, the user enters a combination of letters and the code converts it into the decimal numbers it is linked to.

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

It does the opposite of the textcoder. The user enters the number code and the program converts it to the corresponding letter (a-d).

* 1. **Briefly summarize what the main program code does**  
     it makes the user enter a combination of letters and it converts it to the corresponding number code. Then it asks for a number code and converts it to a number code. After I entered an input for both parts, the code ended.

1. **Explain the main limitation of the program.**

Possibly not having all of the characters available. If every character was available, the user can be more flexible with their inputs and a larger variety of codes can be received.

**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**

Change line 2 to include a-z uppercase and lowercase then add the rest of the alphabet on line 12

* 1. **Code the digits 0 to 9**

Same steps as a

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

Same steps as a

1. **Verify that your program works for *coding* a message containing all of the basic and special characters.**

**Provide a sample of your program output below.**

"""

This program is currently immited to converting only the

characters "ABCDEFGHIJKLMNOPQRSTUVWXYZ" and "abcdefghijklmnopgrstuvwxyz" and "0123456789" and "!#$%@". 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)]

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",50),("1",51),("2",52),("3",53),("4",54),("5",55),("6",56),("7",57),("8",58),("9",59)]

asciiCodes += [("!",60),("#",61),("$",62),("%",63),("@",64)]

# 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)

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.**

Python 3.6.1 (default, Dec 2015, 13:05:11)

[GCC 4.8.2] on linux

Enter a password to code.

password: Aa1!

Coded string is: 065 097 051 060

Enter a coded password to decode

(or return to use the Coded string)

Code: 065 097 051 060

DeCoded string is: Aa1!

1. List your program modifications below:

"""

This program is currently immited to converting only the

characters "ABCDEFGHIJKLMNOPQRSTUVWXYZ" and "abcdefghijklmnopgrstuvwxyz" and "0123456789" and "!#$%@". 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)]

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",50),("1",51),("2",52),("3",53),("4",54),("5",55),("6",56),("7",57),("8",58),("9",59)]

asciiCodes += [("!",60),("#",61),("$",62),("%",63),("@",64)]

# 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)