**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**

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

**To decode an ASCII number into a letter is finding the letter that is correspondent to the decimal number**

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 is showing the 4 letters “ABCD” and “abcd” their corresponding decimals**

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

**The textCoder function works with when the user inputs text into the program and then it gets coded**

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

**The textDeCoder function is the opposite, it does what the textCoder doesn’t which is decode. This function takes the numbers and decodes them to their corresponding letters.**

* 1. Briefly summarize what the main program code does

**The main program code helps with the textCoder**.

1. Explain the main limitation of the program.

**The program only allows users to use the 2 sets of 4 letters.**

**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 letter

"""

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),("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 += [("@",32),("!",33),("#",34),("$",35),("%",36),("/",37)]

# 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(".")

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. Code the digits 0 to 9

asciiCodes +=

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

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

asciiCodes += [("@",32),("!",33),("#",34),("$",35),("%",36),("/",37)]

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.

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 += [("@",32),("!",33),("#",34),("$",35),("%",36),("/",37)]

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.

Christian23# results in **067 104 114 105 115 116 105 097 110 050 051 034**

1. List your program modifications below:

**The modifications in my program were:**

* **Coding the alphabet both uppercase and lowercase into ascii**
* **Coding digits 0-9 in ascii**
* **Coding 5 special characters into ascii (@, !, #, $, %, /)**

**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

**My program codes a secret message by me inputting let's say my name, it will**

**come out like a jumble of words that doesn’t make sense, but it comes out like**

**that because of the coding and how each letter is compared to a different one.**

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

**When I input something into the program, it outputs the code string which is a**

**series of letters and then when I type the letters to decode the message, it comes**

**back to whatever I typed in.**

1. List your program modifications below:

"""

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","B"),("B","V"),("C","G"),("D","Q"),("E","K"),("F","M"),("G","N"),("H","A"),("I","D"),("J","Z"),("K","C"),("L","W"),("M","S"),("N","E"),("O","O"),("P","Y"),("Q","F"),("R","J"),("S","X"),("T","H"),("U","T"),("V","L"),("W","P"),("X","U"),("Y","I"),("Z","R")]

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

asciiCodes += [("0","0"),("1","1"),("2","2"),("3","3"),("4","4"),("5","5"),("6","6"),("7","7"),("8","8"),("9","9")]

asciiCodes += [(" "," "),("!","!"),("#","#"),("$","$"),("%","%"),("/","/")]

# 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])

return "000"

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 message to code.")

textIn = input("message: ")

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 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)