Fall 2020 Computer Science 220
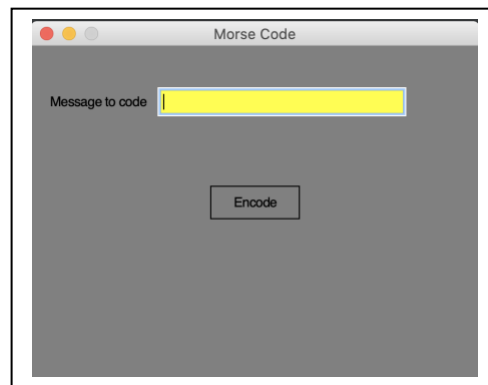## Morse Code

Learning objectives:
> Develop a Python program that uses the author's graphics package.
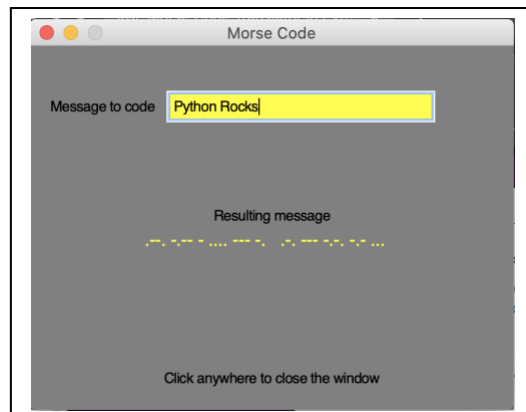> Practice processing string data using string and list methods.

Assignment overview:
For this assignment you are going to write a program to implement Morse code. **Morse code** is a method used in telecommunication to encode text characters as standardized sequences of two different signal durations, called *dots* and *dashes* or *dits* and *dahs*. If we let a period (.) represent a dit (short key closure) and a dash (-) represent a dah (long key closure), then the Morse code version of the English alphabet is

A .-	G --.	M --	S ...	Y -.--
B -...	H	N -.	T -	Z --..
C -.-.	I ..	O ---	U ..-	
D -..	J .---	P .--.	V ...-	
E .	K -.-.	Q --.-	W .--	
F ..-.	L .-..	R .-.	X -..-	

One blank space is used to separate letters and three blanks are used to separate words. For example: the Morse code of the string "PYTHON ROCKS" is ".--. -.-- - .... --- -.   .-. --- -.-. -.- ...". Your program should use a graphical user interface to accept the message to be encoded. An example user interface is show as below.

Once the user clicks within the window, the button should disappear and be replaced by the encoded message and the interface should display "Click anywhere to close the window" to instruct the user to end the program.

Assignment Specifics:

1. You can use a string "ABCDEFGHIJKLMNOPQRSTUVWXYZ" and a list ['.-', '-...', '-.-.', '-..', '.', '..-.', '--.', '....', '..', '.---', '-.-','.-..', '--', '-.','---', '.--.', '--.-', '.-.', '...', '-', '..-', '...-', '.--', '-..-', '-.--', '--..'] to store the codebook. Notice that each letter in the string has the same index as its Morse code encoding in the list. For example, the Morse code of the letter "A" is at index 0 in the string, and its encoding, '.-', is at index 0 in the list.

2. Although the original message may have both uppercase and lowercase letters, you should change the letters of the message to all uppercase. Thus, the message "Python Rocks" will be changed to "PYTHON ROCKS" before being encoded. You may assume the message only contains letters and spaces, and does not start or end with a space.

3. I suggest you write a program to encode a single word first. If that works, you can extend your code to handle words separated by spaces.

Documentation and Style: You are expected to appropriately document and format your program. This means at minimum inserting header information (file name, your name, program description, certification of authenticity), using meaningful variable names where appropriate, and using a consistent indentation style. You do not have to print an introductory message since this is not typically done in graphics-oriented programs. I also expect to see appropriate comments briefly explaining related code segments.

Submission: Upload morse_code.py to your class Oaks account.