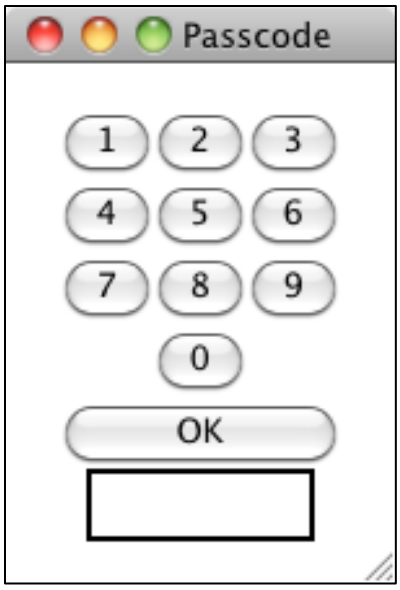
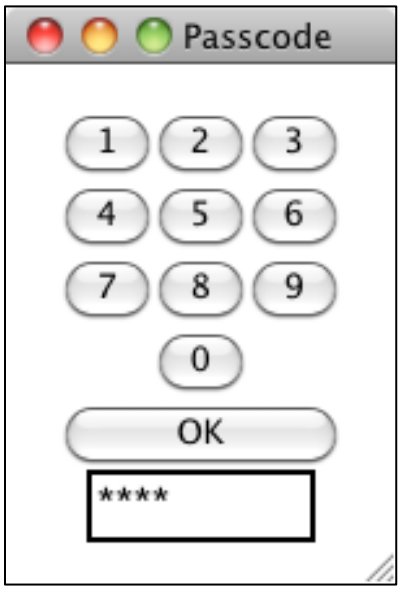
IFB104 GUI Workshop Exercise: Passcodes

Many mobile devices such as smart phones and tablet computers rely on numeric 'passcodes' for basic access control. In this exercise you will use Tkinter to develop a Graphical User Interface to emulate this function.

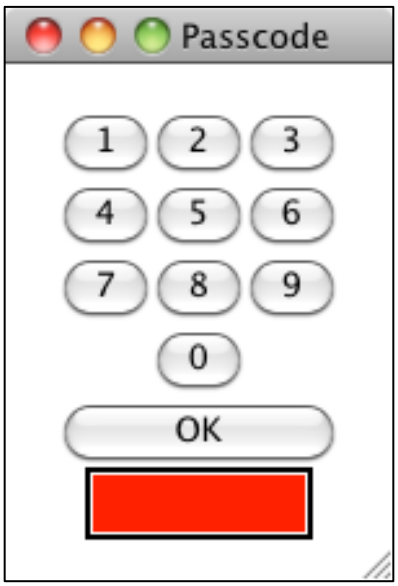
The aim is to develop a Python program, using the Tkinter module, which produces a window like the following:



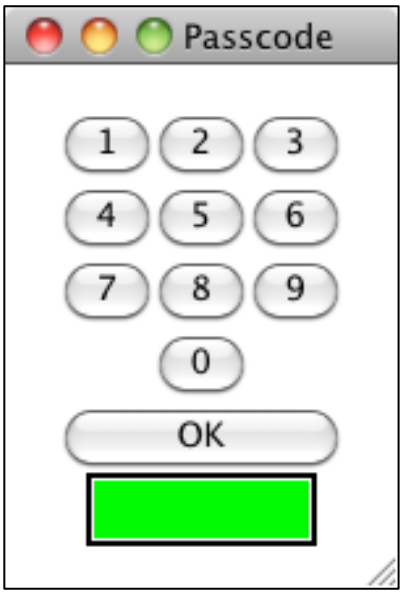
This window has ten numeric buttons, on 'OK' button, and a text field. The user is expected to press the digits in sequence to enter their passcode. As each button is pressed an asterisk is added to the text field to confirm that the button press has been recognised:



When the user presses the 'OK' button the GUI will determine whether or not the passcode entered is a valid one or not. If not then some visual indication must be provided. In the example below the text field turns red.



A valid passcode is similarly acknowledged, in this case by making the text field green.



For the purposes of this exercise valid passcodes are assumed to be your eight digit student numbers (with a leading zero). Any student in your workshop group's number should be accepted.

To complete this exercise you are required to produce a GUI program with capabilities similar to the example above. You are *not* required to duplicate the precise visual interface used above; creativity is encouraged.

Since this is a non-trivial challenge, it is suggested that you develop this program in several steps:

1. Write the 'back-end' function that recognises valid passcodes.
2. Develop a simple GUI 'front-end' for communicating between the user and the back end, without worrying about how the GUI widgets are laid out.
3. Make the GUI look nice by laying out the widgets in a natural format.

Observation: To recognise the ten different digits we need ten separate functions attached to the buttons, meaning that some code will be duplicated 10 times. Cleverer solutions which avoid this duplication are possible, but may be too sophisticated for our current needs. Brute force is acceptable here.