Creating Graphical User Interfaces

1.

```python
import tkinter

window = tkinter.Tk()
frame = tkinter.Frame(window)
frame.pack()

button = tkinter.Button(frame, text='Goodbye', command=lambda:
window.destroy())
button.pack()

window.mainloop()
```

2.

```python
import tkinter

def increment(text):
    """ Increment number represented by the contents of text by 1 and update
        text with the result."""

    count = int(text.get())
    text.set(str(count + 1))

window = tkinter.Tk()
frame = tkinter.Frame(window)
frame.pack()

text = tkinter.StringVar()
text.set('0')

button = tkinter.Button(frame, textvariable=text,
                        command=lambda: increment(text))
button.pack()

window.mainloop()
```

3.

```python
def x():
    return y
```

4.

```python
import tkinter

def count(text, out_data):
    """ Update out_data with the total number of As, Ts, Cs, and Gs found in
text."""
```

```
        data = text.get('0.0', tkinter.END)
        counts = {}
        for char in 'ATCG':
            counts[char] = data.count(char)
        out_data.set('Num As: {0} Num Ts: {1} Num Cs: {2} Num Gs: {3}'.format(
            counts['A'], counts['T'], counts['C'], counts['G']))

window = tkinter.Tk()
text = tkinter.Text(window, height=10, width=40)
text.pack()

out_data = tkinter.StringVar()

button = tkinter.Button(window, text='Count', command=lambda: count(text,
out_data))
button.pack()

label = tkinter.Label(window, textvar=out_data)
label.pack()
window.mainloop()
```

5.

```
import tkinter

def convert(out_data, temp_data):
    """ Convert the value in temp_data, assumed to be in degrees Celsius,
        to Fahrenheit and store the result in out_data. """
    f = temp_data.get()
    out_data.set((f - 32) * 5 / 9)

window = tkinter.Tk()
frame = tkinter.Frame(window)
frame.pack()

out_data = tkinter.StringVar()
temp_data = tkinter.DoubleVar()

tkinter.Label(frame, text='Temperature in Fahrenheit:').pack()

text = tkinter.Entry(frame, textvar=temp_data)
text.pack()

label = tkinter.Label(frame, textvar=out_data)
label.pack()

button = tkinter.Button(frame, text='Convert', command=lambda:
convert(out_data, temp_data))
button.pack()

button2 = tkinter.Button(frame, text='Quit', command=lambda:
window.destroy())
button2.pack()

window.mainloop()
```

6.

```python
import tkinter
import tkinter.filedialog as dialog

class TextEditor:
    """A simple text editor."""

    def __init__(self, parent):
        """Create the GUI."""
        # Framework
        self.parent = parent
        self.frame = tkinter.Frame(parent)
        self.frame.pack()

        # Text box for editing.
        self.text = tkinter.Text(parent)
        self.text.pack()

        # Menus.
        menubar = tkinter.Menu(parent)
        filemenu = tkinter.Menu(menubar)

        filemenu.add_command(label='Save', command=self.save_click)
        filemenu.add_command(label='Quit', command=self.quit_click)

        menubar.add_cascade(label='File', menu=filemenu)
        window.config(menu=menubar)

    def save_click(self):
        """Handle click on 'Save' menu."""
        data = self.text.get('0.0', tkinter.END)
        filename = dialog.asksaveasfilename(
            parent=self.parent,
            filetypes=[('Text', '*.txt')],
            title='Save as...')
        writer = open(filename, 'w')
        writer.write(data)
        writer.close()

    def quit_click(self):
        """Handle click on 'Quit' menu."""
        self.parent.destroy()

if __name__ == '__main__':
    window = tkinter.Tk()
    app = TextEditor(window)
    window.mainloop()
```