

LECTURE 36

GUIs WITH TKINTER

MCS 260 Fall 2020

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REMINDERS

- Worksheet 13 available
- Project 4 proposal deadline is today

GUIs

Today we'll talk about making programs with graphical user interfaces (GUIs). How to do this?

Increasingly popular: Write a program accessed through a browser. HTML allows buttons, text entry boxes, drawing, etc..

Today: We'll build a GUI without a browser, using a **toolkit**, a library of functions for creating GUIs.

TK AND TKINTER

Tk is a **cross-platform** GUI toolkit originally created for the TCL programming language.

`tkinter` is the Python module providing an interface to Tk. It is the only GUI toolkit in the standard library.

`tkinter` dates from the mid-1990s and shows its age in some ways.

WHY LEARN TKINTER?

There are many GUI toolkits, but many are:

- Platform-specific (Cocoa, WPF, ...) and/or
- Large and complex to install (GTK, Qt, Wx) and/or
- Proprietary

While `tkinter` is not common for new projects, it is similar enough to other toolkits to make it useful to learn.

BASIC GUI WORKFLOW

Create a window and hierarchy of **widgets** (buttons, sliders, etc.).

Specify functions to be called when user interacts with widgets, or in response to other events.

Start the GUI main loop, which never returns.

Key point: You lose control of the main loop, and can only respond to things that happen in the GUI.

TKINTER WIDGETS

Module **tkinter** contains window setup functions, lots of constants, and misc. other stuff.

Module **tkinter.ttk** contains widgets for button, checkbox, text entry box, text label, drop-down menu, scrollbar, radio button (mutually exclusive choice), slider, etc.

EXAMPLE

Let's build a simple GUI application that shows a text label and buttons to:

- Display some text in the label area
- Clear the text
- Quit

We'll use the [tkinter module docs](#), the [TkDocs tutorial](#), and the [Unofficial reference manual](#) by John Shipman.

REVIEW

General pattern:

- Make a `tkinter.Tk`
- Make widgets (parent is the `tkinter.Tk` or other widget)
- Pack the widgets, or perform layout in another way
- Call `Tk.mainloop()`

Widgets used today

- `tkinter.ttk.Button` — activate to perform an action
- `tkinter.ttk.Label` — displays text, not directly editable

REFERENCES

- [Official tkinter documentation](#)
- [The Tk docs tutorial](#) demonstrates lots of features, and shows Python code for all its examples.
- [Unofficial reference manual by John Shipman](#)

REVISION HISTORY

- 2020-11-16 More documentation links
- 2020-11-14 Initial publication

