Beginners Python Cheat Sheet
tkinter GUI module

Basic Definitions:

Tkinter: Python library for creating graphical user interfaces (GUIs).
Widget: An element in a GUI (e.g., button, label, entry).
Root Window: The main window that contains all widgets.
Parent/Child Relationship:
- Every widget belongs to a parent container (root window or frame).
- Widgets inside a parent are called children.

Frame: Container used to organize widgets.
Geometry Manager: Methods to arrange widgets (pack, grid, place)

Root Window

root = tk.Tk()	Creates a window named "root"
root.title("Enter the Title for your window here")	
root.geometry("**Width**x**Height**+X+Y")	Sets size and position.
root.attributes("-attribute", value)	Allows setting attributes
"-alpha", value (0.0 to 1.0)	Controls transparency
"-topmost", True/False	Makes it stay on top
"-fullscreen", True/False	Toggles fullscreen mode
root.resizeable(width=True/False, height=True/False)	
root.iconphoto(True, PhotoImage_Object)	Sets the Window Icon
root.destroy()	Closes the window
root.withdraw()	Hides the window (not destroys)
root.deiconify()	Restores a hidden or minimized window
root.lift()	Bring the window to the front
root.update()	Forces tkinter to process pending events
root.mainloop()	Starts the eventloop, listening for events.

Frames

tk.Frame(*parent*, -attributes)	Creates a frame
width, height	Creates dimensions of the frame
bg or background	Background color
bd or borderwidth	Width of the Border around frame
relief	Style of the border
cursor	changes mouse appearance when over frame
padx, pady	creates padding around the frame

tkinter Variables

var = IntVar()	creates an Integer Variable
var = FloatVar()	creates a Float Variable
var = StringVar()	creates a String Variable
var = BooleanVar()	creates a Boolean Variable
var.get()	returns the current value
var.set(x)	sets the value to x
var.trace_add("mode", callback)	calls function when var changes
var.trace_remove("mode", callback_name)	
	removes a trace callback
modes:	write – when the variable is modified
	read – when the variable is read
	unset – when the variable is deleted

Grid Method

widget.grid(*parent*, -attributes)		sets the item into a grid
column	the col number the widget occupies, start at 0.	
columnspan		number of columns the widget takes
in_		register widget as a child
ipadx, ipad y		internal padding
padx, pady		external padding
row	the row number the widget occupies, start at 0.	
rowspan		number of rows the widget takes
sticky	determines how to stick in a cell	
	uses tk.N, tk.NE, tk.S, tk.SE method.	

To make it stretch to fit, use tk.E+tk.W to stretch horizontally.
To make it stretch to fit, use tk.N+tk.S to stretch vertically.

Pack Method

widget.pack(*parent*, -attributes)	packs the item
expand (0, or 1)	should expand to fill space
fill (NONE, X, Y, BOTH)	How to resize as child
side (TOP, BOTTOM, RIGHT, LEFT)	
	Which side of the parent is used for child
in_	register widget as a child
ipadx, ipady	internal padding
padx, pady	external padding
anchor	Specifies where it should be placed
	used N,S,E,W,CENTER syntax

Place Method

widget.place(*parent*, -attributes)	places the item
anchor	Specifies where it should be placed
	used N,S,E,W,CENTER syntax
bordermode (INSIDE, OUTSIDE)	
	specifies if the border should be inside or outside
in_	register widget as a child
relwidth, relheight Float [0.0, 1.0]	
	size of the child widget related to the parent
relx, rely Float [0.0, 1.0]	
	position of the child widget related to the parent
width, height	Absolute height/width of widget
x, y	Absolute position of the widget

Widgets
Common Methods

config(attribute)	configure options after creation
cget(attribute)	gets value of an option
destroy()	removes the widget
bind(event, handler)	binds events
after(ms, func)	calls a function after a delay
update()	manually refresh the widget

Scale

widget = tk.Scale(*parent*, -attribute) creates a Check Button
Attributes
from_, to, orient, length, tickinterval, resolution, variable, showvalue, troughcolor, sliderlength, fg, bg, font, width, height, relief, bd

Attributes used in Widgets

Text
text → Display text for Label, Button, Radiobutton, Checkbutton
image → Display image (PhotoImage or BitmapImage)
compound → Combines text and image (top, bottom, left, right, center)
justify → Align multi-line text (left, center, right)
wraplength → Wrap text after X pixels

Font
font → Font family, size, style (e.g., ("Arial", 12, "bold"))
fg → Foreground/text color
bg → Background color
highlightbackground → Border color when not focused
highlightcolor → Border color when focused
activeforeground → Text color when active
activebackground → Background color when active

Dimensions & Placement
width → Width of widget (chars for Entry, pixels for Scale)
height → Height of widget (chars/lines for Label)
padx, pady → Padding inside geometry managers (pack, grid)
relief → Border style (flat, raised, sunken, groove, ridge)
bd → Border width
anchor → Position of content inside widget (n, s, e, w, center)

State & Interaction
state → Widget state: normal, disabled, active
command → Function executed on action
variable → Linked IntVar, StringVar, or FloatVar
value → Value of a Radiobutton when selected
onvalue / offvalue → Values for Checkbutton when checked/unchecked
show → Mask character for Entry (e.g., "*" for password)
validate → Input validation mode (focus, key, etc.)
validatecommand → Function executed for validation

Label

widget = tk.Label(*parent*, -attribute)   creates a text label
Attributes
text, image, compound, justify, wraplength, fg, bg, font, width, height, anchor, relief, bd

Button

widget = tk.Button(*parent*, -attribute)   creates a Button
Attributes
text, command, state, activeforeground, activebackground, fg, bg, font, width, height, relief, bd

Entry

widget = tk.Entry(*parent*, -attribute)   creates a Text Entry Box
Attributes
width, show, textvariable, fg, bg, font, relief, bd, state

Option Box

widget = ttk.Optionbox(*parent*, -attribute)   creates a Dropdown Menu
Attributes
variable, values, fg, bg, font, width, height, relief, bd

Radio Button

widget = tk.Radiobutton(*parent*, -attribute)   creates a Radio Button
Attributes
text, variable, value, state, fg, bg, font, width, height, relief, bd

Check Button

widget = tk.Checkbutton(*parent*, -attribute)   creates a Check Button
Attributes
text, variable, onvalue, offvalue, state, fg, bg, font, width, height, relief, bd

Spinbox

widget = tk.Spinbox(*parent*, -attribute) creates a Check Button
Attributes
from_, to, increment, width, state, fg, bg, font, relief, bd, textvariable