import tkinter as tk

import math

class Compass:

def \_\_init\_\_(self, master):

self.master = master

self.master.title("Realistic Compass")

self.canvas = tk.Canvas(master, width=400, height=400, bg='grey')

self.canvas.pack()

self.draw\_compass()

self.master.bind("<Motion>", self.update\_needle)

def draw\_compass(self):

# Draw the compass circle

self.canvas.create\_oval(50, 50, 350, 350, fill='lightblue', outline='black', width=2)

# Draw the inner circle

self.canvas.create\_oval(150, 150, 250, 250, fill='white', outline='black', width=2)

# Directions

directions = ['E', 'S', 'W', 'N']

angle = 0

for direction in directions:

x = 200 + 100 \* math.cos(math.radians(angle))

y = 200 + 100 \* math.sin(math.radians(angle))

self.canvas.create\_text(x, y, text=direction, font=('Arial', 24, 'bold'))

angle += 90

# Draw a more realistic needle

self.needle = self.canvas.create\_line(200, 200, 200, 100, fill='purple', width=6)

self.needle\_circle = self.canvas.create\_oval(195, 195, 205, 205, fill='gold', outline='black') # Center circle

def update\_needle(self, event):

angle = math.degrees(math.atan2(event.y - 200, event.x - 200))

x2 = 200 + 100 \* math.cos(math.radians(angle))

y2 = 200 + 100 \* math.sin(math.radians(angle))

self.canvas.coords(self.needle, 200, 200, x2, y2)

if \_\_name\_\_ == "\_\_main\_\_":

root = tk.Tk()

compass = Compass(root)

root.mainloop()