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from tkinter import *

import math

import numpy as np

def button_click(char):
    global calc_operator
    calc_operator += str(char)
    text_input.set(calc_operator)

def button_clear_all():
    global calc_operator
    calc_operator = ""
    text_input.set("")

def button_delete():
    global calc_operator
    text = calc_operator[:-1]
    calc_operator = text
    text_input.set(text)

def button_equal():
    global calc_operator
    temp_op = str(eval(calc_operator))
    text_input.set(temp_op)
    calc_operator = temp_op

def percent():
    global calc_operator
    temp = str(eval(calc_operator+' / 100'))
    calc_operator = temp
    text_input.set(temp)

def trig_sin():
    global calc_operator
    result = str(math.sin(math.radians(int(calc_operator))))
    calc_operator = result
    text_input.set(result)

def trig_cos():
    global calc_operator
    result = str(math.cos(math.radians(int(calc_operator))))
    calc_operator = result
    text_input.set(result)

def trig_tan():
    global calc_operator
    result = str(math.tan(math.radians(int(calc_operator))))

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        calc_operator = result
        text_input.set(result)

def factorial(n):
    if n==0 or n==1:
        return 1
    else:
        return n*factorial(n-1)

def fact_func():
    global calc_operator
    result = str(factorial(int(calc_operator)))
    calc_operator = result
    text_input.set(result)

def square_root():
    global calc_operator
    if int(calc_operator)>=0:
        temp = str(eval(calc_operator+'**(1/2)'))
        calc_operator = temp
    else:
        temp = "ERROR"
    text_input.set(temp)

def third_root():
    global calc_operator
    if int(calc_operator)>=0:
        temp = str(eval(calc_operator+'**(1/3)'))
        calc_operator = temp
    else:
        temp = "ERROR"
    text_input.set(temp)

tk_calc = Tk()
tk_calc.configure(bg="#293C4A", bd=10)
tk_calc.title("NexthikeCalculator Project")

calc_operator = ""
text_input = StringVar()

text_display = Entry(tk_calc, font=('arial', 20, 'bold'),
textvariable=text_input,
                    bd=5, insertwidth = 5, bg='#FFBF00',
justify='right').grid(columnspan=5, padx = 10, pady = 15)

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button_params = {'bd':5, 'fg':'#BBB', 'bg':'#8B8000', 'font':('arial', 20,
'bold')}
button_params_main = {'bd':5, 'fg':'#000', 'bg':'#3C3636', 'font':('arial',
20, 'bold')}

button_1 = Button(tk_calc, button_params_main, text='1',
                    command=lambda:button_click('1')).grid(row=8, column=0,
                    sticky="nsew")
button_2 = Button(tk_calc, button_params_main, text='2',
                    command=lambda:button_click('2')).grid(row=8, column=1,
                    sticky="nsew")
button_3 = Button(tk_calc, button_params_main, text='3',
                    command=lambda:button_click('3')).grid(row=8, column=2,
                    sticky="nsew")
add = Button(tk_calc, button_params_main, text='+',
              command=lambda:button_click('+')).grid(row=8, column=3,
              sticky="nsew")
sub = Button(tk_calc, button_params_main, text='-',
              command=lambda:button_click('-')).grid(row=8, column=4,
              sticky="nsew")

button_4 = Button(tk_calc, button_params_main, text='4',
                    command=lambda:button_click('4')).grid(row=7, column=0,
                    sticky="nsew")
button_5 = Button(tk_calc, button_params_main, text='5',
                    command=lambda:button_click('5')).grid(row=7, column=1,
                    sticky="nsew")
button_6 = Button(tk_calc, button_params_main, text='6',
                    command=lambda:button_click('6')).grid(row=7, column=2,
                    sticky="nsew")
mul = Button(tk_calc, button_params_main, text='*',
              command=lambda:button_click('*')).grid(row=7, column=3,
              sticky="nsew")
div = Button(tk_calc, button_params_main, text='/',
              command=lambda:button_click('/')).grid(row=7, column=4,
              sticky="nsew")

button_7 = Button(tk_calc, button_params_main, text='7',
                    command=lambda:button_click('7')).grid(row=6, column=0,
                    sticky="nsew")
button_8 = Button(tk_calc, button_params_main, text='8',
                    command=lambda:button_click('8')).grid(row=6, column=1,
                    sticky="nsew")
button_9 = Button(tk_calc, button_params_main, text='9',
                    command=lambda:button_click('9')).grid(row=6, column=2,
                    sticky="nsew")
delete_one = Button(tk_calc, bd=5, fg='#000', font=('sans-serif', 20, 'bold'),

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        text='DEL', command=button_delete, bg='#db701f').grid(row=6,
column=3, sticky="nsew")
delete_all = Button(tk_calc, bd=5, fg='#000', font=('sans-serif', 20, 'bold'),
        text='AC', command=button_clear_all, bg='#db701f').grid(row=6,
column=4, sticky="nsew")

button_0 = Button(tk_calc, button_params_main, text='0',
        command=lambda:button_click('0')).grid(row=9, column=0,
sticky="nsew")
point = Button(tk_calc, button_params_main, text='.',
        command=lambda:button_click('.')).grid(row=9, column=1,
sticky="nsew")

equal = Button(tk_calc, button_params_main, text='=',
        command=button_equal).grid(row=9, columnspan=2, column=3,
sticky="nsew")

percentage = Button(tk_calc, button_params, text='%',
        command=percent).grid(row=9, column=2, sticky="nsew")

sine = Button(tk_calc, button_params, text='sin',
        command=trig_sin).grid(row=1, column=0, sticky="nsew")

cosine = Button(tk_calc, button_params, text='cos',
        command=trig_cos).grid(row=1, column=1, sticky="nsew")

tangent = Button(tk_calc, button_params, text='tan',
        command=trig_tan).grid(row=1, column=2, sticky="nsew")

pi_num = Button(tk_calc, button_params, text='π',
        command=lambda:button_click(str(math.pi))).grid(row=1,
column=4, sticky="nsew")

factorial_button = Button(tk_calc, button_params, text='x!',
        command=fact_func).grid(row=1, column=3, sticky="nsew")

second_power = Button(tk_calc, button_params, text='x\u00B2',
        command=lambda:button_click('**2')).grid(row=2, column=0,
sticky="nsew")

third_power = Button(tk_calc, button_params, text='x\u00B3',
        command=lambda:button_click('**3')).grid(row=2, column=1,
sticky="nsew")

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square_root = Button(tk_calc, button_params, text='\u00B2\u221A',  
                      command=square_root).grid(row=2, column=3, sticky="nsew")  
  
third_root = Button(tk_calc, button_params, text='\u00B3\u221A',  
                    command=third_root).grid(row=2, column=4, sticky="nsew")  
  
nth_root = Button(tk_calc, button_params, text='\u221A',  
                  command=lambda:button_click('**(1/')).grid(row=2, column=2,  
                    sticky="nsew")  
  
tk_calc.mainloop()
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