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1  #Simple Calculator
2  import tkinter
3  from tkinter import RIGHT, END, DISABLED, NORMAL
4
5  #Define window
6  root = tkinter.Tk()
7  root.title('Calculator')
8  root.iconbitmap('calc.ico')
9  root.geometry('300x400')
10 root.resizable(0,0)
11
12 #Define colors and fonts
13 dark_green = '#93af22'
14 light_green = '#acc253'
15 white_green = '#edefe0'
16 button_font = ('Arial', 18)
17 display_font = ('Arial', 30)
18
19 #Define functions
20 def submit_number(number):
21     """Add a number or decimal to the display"""
22     #Insert the number or decimal pressed to the end of the display
23     display.insert(END, number)
24
25     #If decimal was pressed, disable the decimal button so it cannot be pressed twice
26     if "." in display.get():
27         decimal_button.config(state=DISABLED)
28
29
30 def operate(operator):
31     """Store the first number of the expression and the operation to be used"""
32     global first_number
33     global operation
34
35     #Get the operator pressed and the current value of the display. This is the first
36     #number in the calculation
37     operation = operator
38     first_number = display.get()
39
40     #Delete the value (first number) from entry display
41     display.delete(0, END)
42
43     #Disable all operator buttons until equal or clear is pressed
44     add_button.config(state=DISABLED)
45     subtract_button.config(state=DISABLED)
46     multiply_button.config(state=DISABLED)
47     divide_button.config(state=DISABLED)
48     exponent_button.config(state=DISABLED)
49     inverse_button.config(state=DISABLED)
50     square_button.config(state=DISABLED)
51
52     #Return decimal button to normal state
53     decimal_button.config(state=NORMAL)
54
55 def equal():
56     """Run the stored operation for two number."""
57     #Perform the desired mathematics
58     if operation == 'add':
59         value = float(first_number) + float(display.get())
60     elif operation == 'subtract':
61         value = float(first_number) - float(display.get())
62     elif operation == 'multiply':
63         value = float(first_number) * float(display.get())
64     elif operation == 'divide':
65         if display.get() == "0":
66             value = "ERROR"

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67         else:
68             value = float(first_number) / float(display.get())
69     elif operation == 'exponent':
70         value = float(first_number) ** float(display.get())
71
72     #Remove the current value of the display and update it with the answer
73     display.delete(0, END)
74     display.insert(0, value)
75
76     #Return buttons to normal states
77     enable_buttons()
78
79
80 def enable_buttons():
81     """Enabel all butonns on the calculator"""
82     decimal_button.config(state=NORMAL)
83     add_button.config(state=NORMAL)
84     subtract_button.config(state=NORMAL)
85     multiply_button.config(state=NORMAL)
86     divide_button.config(state=NORMAL)
87     exponent_button.config(state=NORMAL)
88     inverse_button.config(state=NORMAL)
89     square_button.config(state=NORMAL)
90
91
92 def clear():
93     """Clear the display"""
94     display.delete(0, END)
95
96     #Return buttons to normal state
97     enable_buttons()
98
99
100 def inverse():
101     """Calculate the inverse of a given number."""
102     #Do not allow for 1/0
103     if display.get() == '0':
104         value = 'ERROR'
105     else:
106         value = 1/float(display.get())
107
108     #Remove the current value in the display and update it with the answer
109     display.delete(0, END)
110     display.insert(0, value)
111
112
113 def square():
114     """Calculate the square of a given number."""
115     value = float(display.get())**2
116
117     #Remove the current value in the display and update it with the answer
118     display.delete(0, END)
119     display.insert(0, value)
120
121
122 def negate():
123     """Negate a given number."""
124     value = -1*float(display.get())
125
126     #Remove the current value in the display and update it with the answer
127     display.delete(0, END)
128     display.insert(0, value)
129
130
131 #GUI Layout
132 #Define frames
133 display_frame = tkinter.LabelFrame(root)

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134 button_frame = tkinter.LabelFrame(root)
135 display_frame.pack(padx=2, pady=(5,20))
136 button_frame.pack(padx=2, pady=5)
137
138 #Layout for the display frame
139 display = tkinter.Entry(display_frame, width=50, font=display_font, bg=white_green,
borderwidth=5, justify=RIGHT)
140 display.pack(padx=5, pady=5)
141
142 #Layout for the button frame
143 clear_button = tkinter.Button(button_frame, text="Clear", font=button_font,
bg=dark_green, command=clear)
144 quit_button = tkinter.Button(button_frame, text="Quit", font=button_font,
bg=dark_green, command=root.destroy)
145
146 inverse_button = tkinter.Button(button_frame, text='1/x', font=button_font,
bg=light_green, command=inverse)
147 square_button = tkinter.Button(button_frame, text='x^2', font=button_font,
bg=light_green, command=square)
148 exponent_button = tkinter.Button(button_frame, text='x^n', font=button_font,
bg=light_green, command=lambda:operate('exponent'))
149 divide_button = tkinter.Button(button_frame, text=' / ', font=button_font,
bg=light_green, command=lambda:operate('divide'))
150 multiply_button = tkinter.Button(button_frame, text='*', font=button_font,
bg=light_green, command=lambda:operate('multiply'))
151 subtract_button = tkinter.Button(button_frame, text='-', font=button_font,
bg=light_green, command=lambda:operate('subtract'))
152 add_button = tkinter.Button(button_frame, text='+', font=button_font, bg=light_green,
command=lambda:operate('add'))
153 equal_button = tkinter.Button(button_frame, text='=', font=button_font, bg=dark_green,
command=equal)
154 decimal_button = tkinter.Button(button_frame, text='.', font=button_font, bg='black',
fg='white', command=lambda:submit_number("."))
155 negate_button = tkinter.Button(button_frame, text='+/-', font=button_font, bg='black',
fg='white', command=negate)
156
157 nine_button = tkinter.Button(button_frame, text='9', font=button_font, bg='black',
fg='white', command=lambda:submit_number(9))
158 eight_button = tkinter.Button(button_frame, text='8', font=button_font, bg='black',
fg='white', command=lambda:submit_number(8))
159 seven_button = tkinter.Button(button_frame, text='7', font=button_font, bg='black',
fg='white', command=lambda:submit_number(7))
160 six_button = tkinter.Button(button_frame, text='6', font=button_font, bg='black',
fg='white', command=lambda:submit_number(6))
161 five_button = tkinter.Button(button_frame, text='5', font=button_font, bg='black',
fg='white', command=lambda:submit_number(5))
162 four_button = tkinter.Button(button_frame, text='4', font=button_font, bg='black',
fg='white', command=lambda:submit_number(4))
163 three_button = tkinter.Button(button_frame, text='3', font=button_font, bg='black',
fg='white', command=lambda:submit_number(3))
164 two_button = tkinter.Button(button_frame, text='2', font=button_font, bg='black',
fg='white', command=lambda:submit_number(2))
165 one_button = tkinter.Button(button_frame, text='1', font=button_font, bg='black',
fg='white', command=lambda:submit_number(1))
166 zero_button = tkinter.Button(button_frame, text='0', font=button_font, bg='black',
fg='white', command=lambda:submit_number(0))
167
168 #First row
169 clear_button.grid(row=0, column=0, columnspan=2, pady=1, sticky="WE")
170 quit_button.grid(row=0, column=2, columnspan=2, pady=1, sticky="WE")
171 #Second row
172 inverse_button.grid(row=1, column=0, pady=1, sticky="WE")
173 square_button.grid(row=1, column=1, pady=1, sticky="WE")
174 exponent_button.grid(row=1, column=2, pady=1, sticky="WE")
175 divide_button.grid(row=1, column=3, pady=1, sticky="WE")
176 #Third row (Add padding to create the size of the columns)
177 seven_button.grid(row=2, column=0, pady=1, sticky="WE", ipadx=20)

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178 eight_button.grid(row=2, column=1, pady=1, sticky="WE", ipadx=20)
179 nine_button.grid(row=2, column=2, pady=1, sticky="WE", ipadx=20)
180 multiply_button.grid(row=2, column=3, pady=1, sticky="WE", ipadx=20)
181 #Fourth row
182 four_button.grid(row=3, column=0, pady=1, sticky="WE")
183 five_button.grid(row=3, column=1, pady=1, sticky="WE")
184 six_button.grid(row=3, column=2, pady=1, sticky="WE")
185 subtract_button.grid(row=3, column=3, pady=1, sticky="WE")
186 #Fifth row
187 one_button.grid(row=4, column=0, pady=1, sticky="WE")
188 two_button.grid(row=4, column=1, pady=1, sticky="WE")
189 three_button.grid(row=4, column=2, pady=1, sticky="WE")
190 add_button.grid(row=4, column=3, pady=1, sticky="WE")
191 #Sixth row
192 negate_button.grid(row=5, column=0, pady=1, sticky="WE")
193 zero_button.grid(row=5, column=1, pady=1, sticky="WE")
194 decimal_button.grid(row=5, column=2, pady=1, sticky="WE")
195 equal_button.grid(row=5, column=3, pady=1, sticky="WE")
196
197 #Run the root window's main loop
198 root.mainloop()
```