Report for Scientific Calculator (as a project for INT-213)

Python Programming (INT 213)

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Semester : 3rd
School : School of Computer engineering
University: Lovely Professional University

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CONTENT

SCIENTICFIC CALCULATOR

ABSTRACT:

- A digital calculator is a type of electronic calculator, usually but not always handheld, designed to calculate problems in science, engineering, and mathematics. They have completely replaced slide rules in traditional applications, and are widely used in both education and professional settings.

- Scientific calculators are used widely in situations that require quick access to certain mathematical functions, especially those that were once looked up in mathematical tables, such as trigonometric functions or logarithms. They are also used for calculations of very large or very small numbers, as in some aspects of astronomy, physics, and chemistry.

INTRODUCTION

- **CONTEXT**

  This Project has been done as a part of our course for CSE at Lovely Professional University.

- **MOTIVATION**

  Being interested in development, coding and building project. This project was a great occasion to give us the time to learn and confirm our interest. Fascinated about the task a Scientific calculator performs me and my team partner researched and acquired the basic knowledge on this project and we have successfully build it from scratch in python programming language.

- **IDEA**

  We got the idea from our teacher and friend. Hence, we decided that we will make a Scientific calculator for our project.

OBJECTIVES OF SCIENTIFIC CALCULATOR

Basic functions and exponents

Calculate basic functions such as addition, subtraction, multiplication, and division. Along with negation, you can also raise numbers to another power and find a square root of a number or formula. It's also possible to use a scientific calculator to find the square root of a number, and this is one of the simplest operations you can perform

Logarithms

Logarithms are mostly used by those involved in the medical and engineering fields, but other careers may encounter them at some point. They can be tricky to solve by hand, but with the help of a scientific calculator, the process can be much easier.

Sine, cosine, and tangent functions

With scientific calculators, you can get the answer almost immediately once you have properly entered the function. Look for sin, cos, and tan buttons on any calculator to make sure it includes these functions.

Scientific notation

A scientific calculator isn't just used for more complicated math problems. In fact, one of its best uses may be that it can calculate scientific notation. For numbers that can't be written in decimal point form because they are too large, a normal calculator won't be able to cover it.

If you're wondering how to do scientific notation on a calculator, it's not that complicated. In order to perform the operation:

- Locate the 10^x on your device
- Enter in your x value
- Press the "Enter" button in order to receive the answer

- **Binary functions**

You'll most likely encounter this in algebra or calculus when you are solving for an unknown, but you may also discuss it when learning about the Cartesian product and subsets.

This is another type of equation that is difficult to track without having a calculator that has memory, because if you can store the results the calculator gives you, you can build off the work that you have accomplished before or save your efforts for another time.

Team Members

❖ASHISH KUMAR TIWARI

- Coding(Implemented Functions used in program)
- Made half of the report

❖ ANIRBAN BAIN

- Coding(Made the GUI for the project)
- Made another half of the report

Functions and tools used

- **Python Mathematical Functions**

The math module is a standard module in Python and is always available. To use mathematical functions under this module, you have to import the module using import math.

- **tkinter**

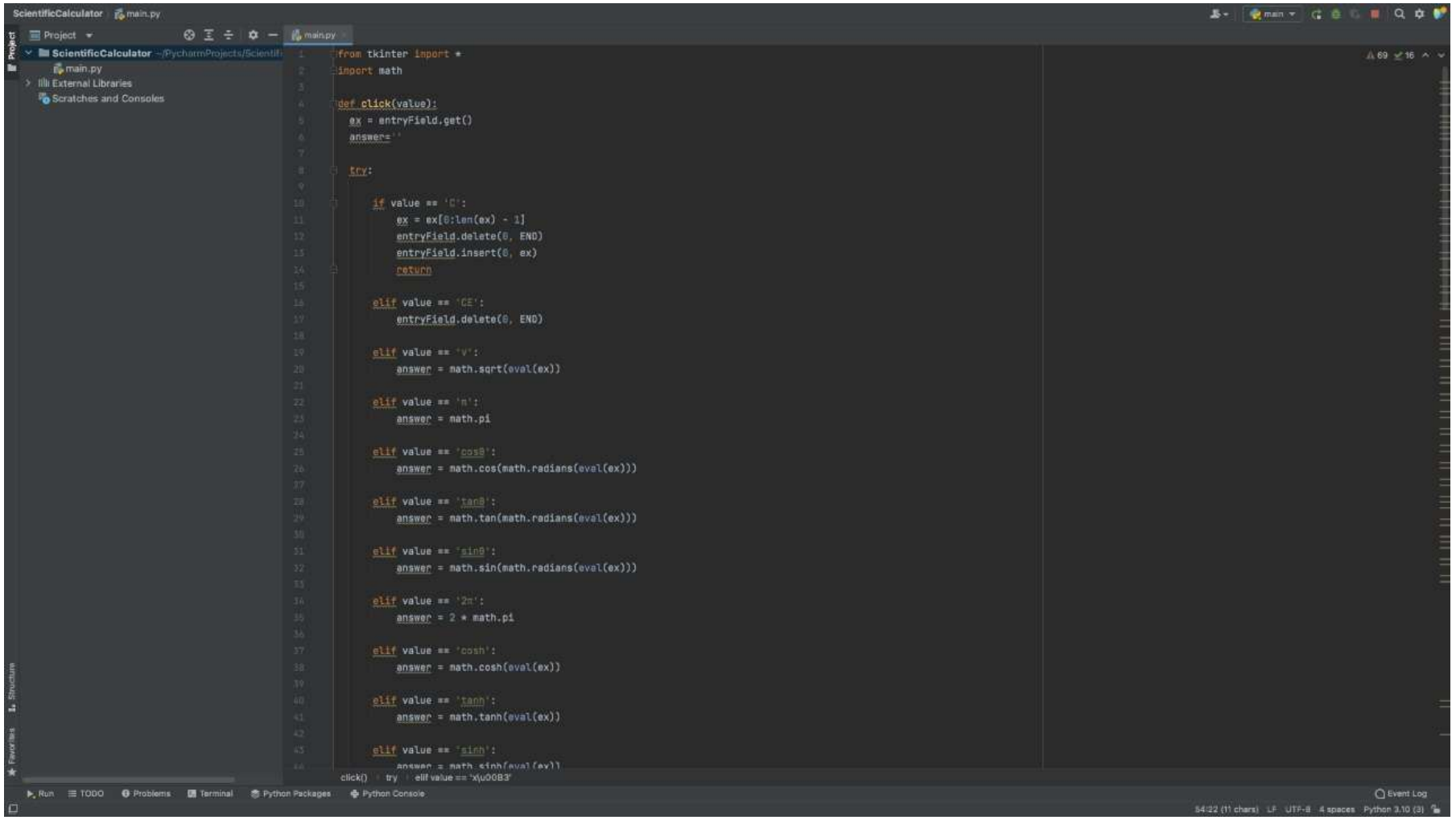
Tkinter is a Python binding to the Tk GUI toolkit. It is the standard Python interface to the Tk GUI toolkit, and is Python's de facto standard GUI. Tkinter is included with standard GNU/Linux, Microsoft Windows and macOS installs of Python. The name Tkinter comes from Tk interface. Tkinter was written by Fredrik Lundh.

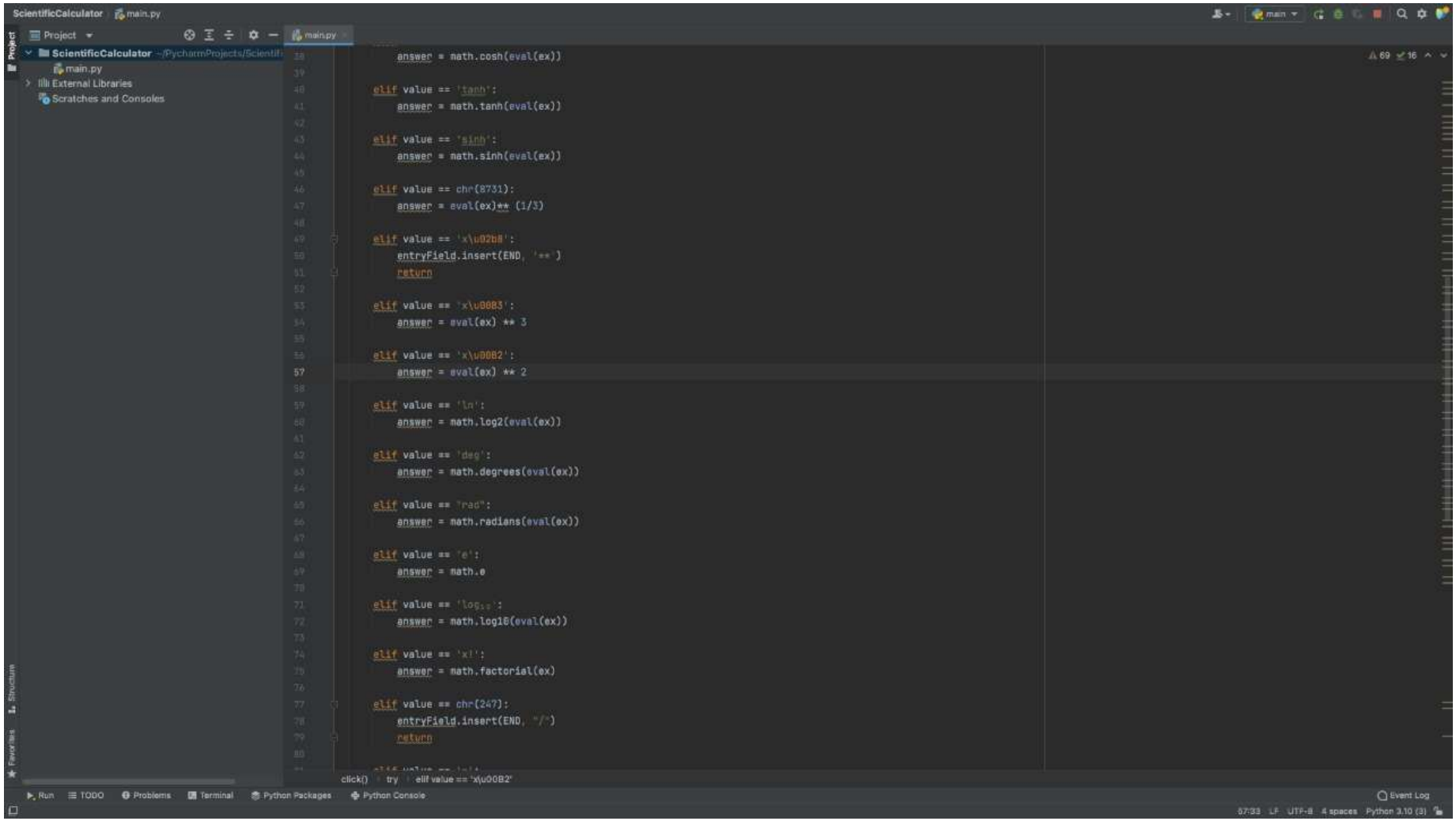
- **eval()**

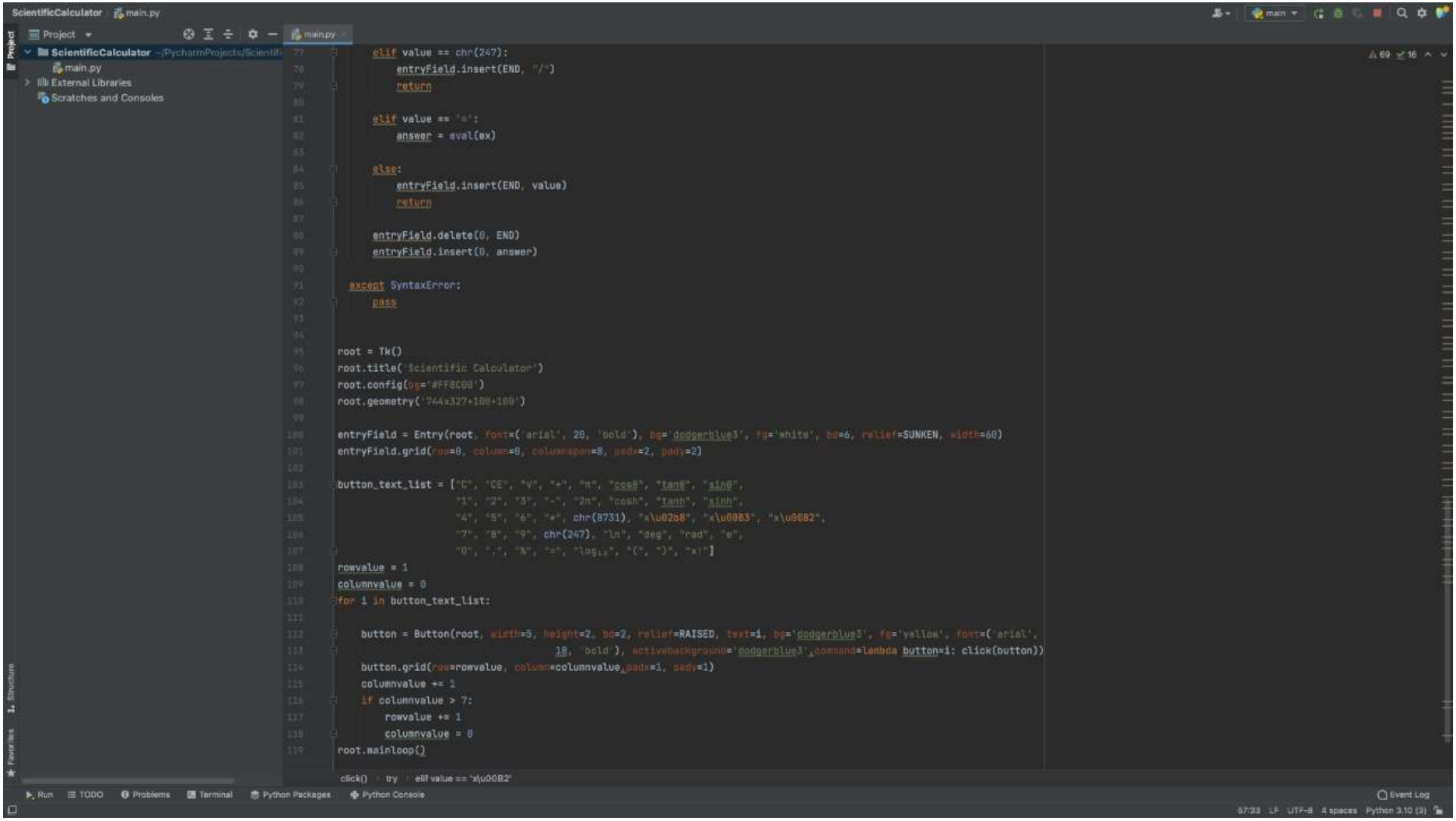
eval is a built-in- function used in python, eval function parses the expression argument and evaluates it as a python expression. In simple words, the eval function evaluates the “String” like a python expression and returns the result as an integer.

Screenshots

GUI


ScientificCalculator
main.py
Project
ScientificCalculator ~/PycharmProjects/Scientifi
main.py
External Libraries
Scratches and Consoles
from tkinter import *
import math
def click(value):
ex = entryField.get()
answer=''
try:
if value == 'C':
ex = ex[0:len(ex) - 1]
entryField.delete(0, END)
entryField.insert(0, ex)
return
elif value == 'CE':
entryField.delete(0, END)
elif value == 'v':
answer = math.sqrt(eval(ex))
elif value == 'π':
answer = math.pi
elif value == 'cos0':
answer = math.cos(math.radians(eval(ex)))
elif value == 'tan0':
answer = math.tan(math.radians(eval(ex)))
elif value == 'sin0':
answer = math.sin(math.radians(eval(ex)))
elif value == '2π':
answer = 2 * math.pi
elif value == 'cosh':
answer = math.cosh(eval(ex))
elif value == 'tanh':
answer = math.tanh(eval(ex))
elif value == 'sinh':
click() try elif value == '\u0083'
Run TODO Problems Terminal Python Packages Python Console
Event Log
54:22 (11 chars) LF UTF-8 4 spaces Python 3.10 (3)


ScientificCalculator
main.py
Project
ScientificCalculator ~/PycharmProjects/Scientif
main.py
External Libraries
Scratches and Consoles
answer = math.cosh(eval(ex))
elif value == 'tanh':
answer = math.tanh(eval(ex))
elif value == 'sinh':
answer = math.sinh(eval(ex))
elif value == chr(8731):
answer = eval(ex)** (1/3)
elif value == 'x\u02b8':
entryField.insert(END, '**')
return
elif value == 'x\u0083':
answer = eval(ex) ** 3
elif value == 'x\u00B2':
answer = eval(ex) ** 2
elif value == 'ln':
answer = math.log2(eval(ex))
elif value == 'deg':
answer = math.degrees(eval(ex))
elif value == "rad":
answer = math.radians(eval(ex))
elif value == 'e':
answer = math.e
elif value == 'log10':
answer = math.log10(eval(ex))
elif value == 'x!':
answer = math.factorial(ex)
elif value == chr(247):
entryField.insert(END, "/")
return
click() › try › elif value == 'x\u00B2'
Run
TODO
Problems
Terminal
Python Packages
Python Console
Event Log
57:33 LF UTF-8 4 spaces Python 3.10 (3)


ScientificCalculator
main.py
Project
ScientificCalculator ~/PycharmProjects/Scientif
main.py
External Libraries
Scratches and Consoles
elif value == chr(247):
entryField.insert(END, "/")
return
elif value == 'x':
answer = eval(ex)
else:
entryField.insert(END, value)
return
entryField.delete(0, END)
entryField.insert(0, answer)
except SyntaxError:
pass
root = Tk()
root.title('Scientific Calculator')
root.config(bg='#FF8C00')
root.geometry('744x327+100+100')
entryField = Entry(root, font=('arial', 20, 'bold'), bg='dodgerblue3', fg='white', bd=6, relief=SUNKEN, width=60)
entryField.grid(row=0, column=0, columnspan=8, padx=2, pady=2)
button_text_list = ["C", "CE", "√", "+", "π", "cos", "tan", "sin",
"1", "2", "3", "-", "2π", "cosh", "tanh", "sinh",
"4", "5", "6", "*", chr(8731), "x\u02b8", "x\u00b3", "x\u00b2",
"7", "8", "9", chr(247), "ln", "deg", "rad", "e",
"0", ".", "%", "=", "log10", "(", ")", "x!"]
rowvalue = 1
columnvalue = 0
for i in button_text_list:
button = Button(root, width=5, height=2, bd=2, relief=RAISED, text=i, bg='dodgerblue3', fg='yellow', font=('arial',
18, 'bold'), activebackground='dodgerblue3', command=lambda button=i: click(button))
button.grid(row=rowvalue, column=columnvalue, padx=1, pady=1)
columnvalue += 1
if columnvalue > 7:
rowvalue += 1
columnvalue = 0
root.mainloop()
click() try elif value == 'x\u00b2'
Run TODO Problems Terminal Python Packages Python Console
Event Log
57:33 LF UTF-8 4 spaces Python 3.10 (3)

CONCLUSION

It is our hope that this report will be of huge help for understanding of our project. We have made this project successful with our teamwork and guidance of our seniors and teacher. Using tkinter and various functions like math function we have made Scientific calculator, which is capable of doing all the task which a scientific calculator can do. For successful completion of this project me and my teammate had discussed through video-calling and supported each other at every difficult part.

REFERENCES

- GOOGLE : https://www.google.co.in/
- YOUTUBE : https://www.youtube.com/
- STACK OVER FLOW : https://stackoverflow.com/

Thank You

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