This assignment only needs to be completed by students intending to complete Track A.

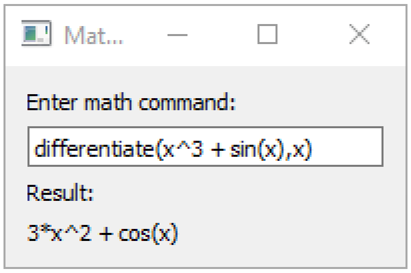
PIC 16, Winter 2018 – Assignment 6M

Assigned 2/12/2018. Code (a single `.py` file) due by the end of class 2/16/2018 on CCLE. Hand in a printout of this document with the self-assessment portion completed by the end of class on 2/16/2018.

In this assignment, you will create a simple math helper GUI.

Task

Create a GUI with a layout similar to:



Enter math command:

differentiate(x^3 + sin(x),x)

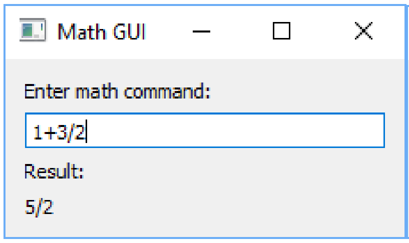
Result:

3*x^2 + cos(x)

Allow the user to enter a math command in the text box; when the user presses enter, the result should show below. The program should support differentiation, (indefinite) integration, equation solving, and basic arithmetic. While the basic syntax of SymPy is preserved - <command>(<expression>, <variable>) – some additional features should be implemented for the convenience of the user (although the majority of points can be earned without them.)

- □ `diff`, `differentiate`, `derivative` are all acceptable commands for taking derivatives (1pt)
- □ `int`, `integrate`, `integral` are all acceptable commands for taking (indefinite) integrals (1pt)
- □ `sol`, `solve`, `solution` are all acceptable commands for solving equations (1pt)
- □ ^ can be used in place of ** and prints in place of ** in the result (1pt)
- □ Equations to be solved can be entered with an = sign, i.e. `x^2 + 2*x = 3`(3pt)
- □ The program should appear on top of other windows, even when not in focus (3pt)

Some screenshots are provided to show how your program should look and behave:

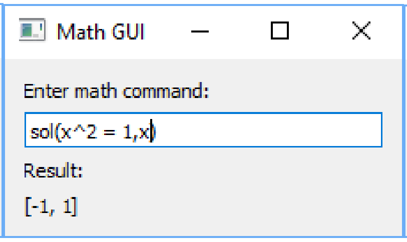


Enter math command:

1+3/2

Result:

5/2

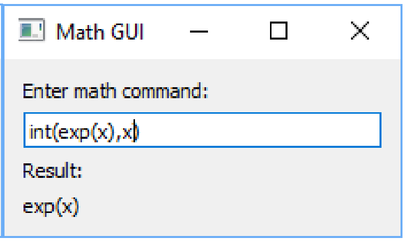


Enter math command:

sol(x^2 = 1,x)

Result:

[-1, 1]



Enter math command:

int(exp(x),x)

Result:

exp(x)

Self-Assessment

Does your program satisfy the basic required behavior (no convenience features required)? At a minimum, check the output of: `solve(a*x + b, x)`,`diff(x**2 - 1, x)`,`integrate(exp(z),z)`, and `1+3/2`. The last one might take some extra work. (90pt)

Check off the features above that your program satisfies. (10pt max)

Indicate your total score (100 max):

Hints: `sympify`, `re.subs`. We haven't covered it, but I recommend `QVBoxLayout`; it's easy.