# ADVANCED SCIENTIFIC CALCULATOR AND GRAPH PLOTTER

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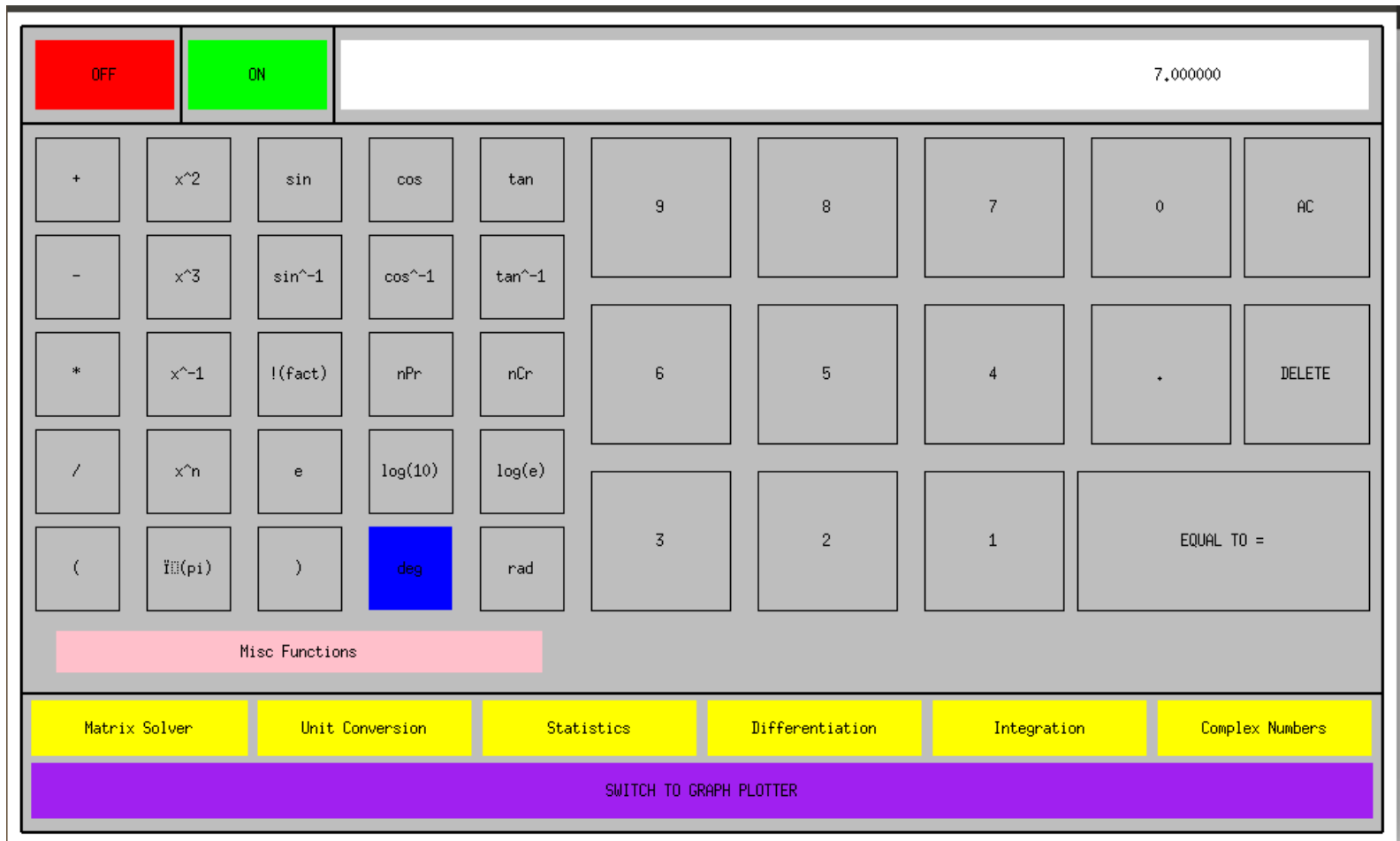RAHUL KUNDU          140040070

# PROBLEM STATEMENT

- We are to design and make a calculator that will evaluate an expression given to it and generate the correct accurate result.

- The calculator can handle **<u>integers</u>** as well as **<u>decimal</u>** numbers.

- It must accommodate any number of balanced parentheses and a complex equation to a particular limit.

- The range of accuracy of numbers is upto 6 decimal digits.

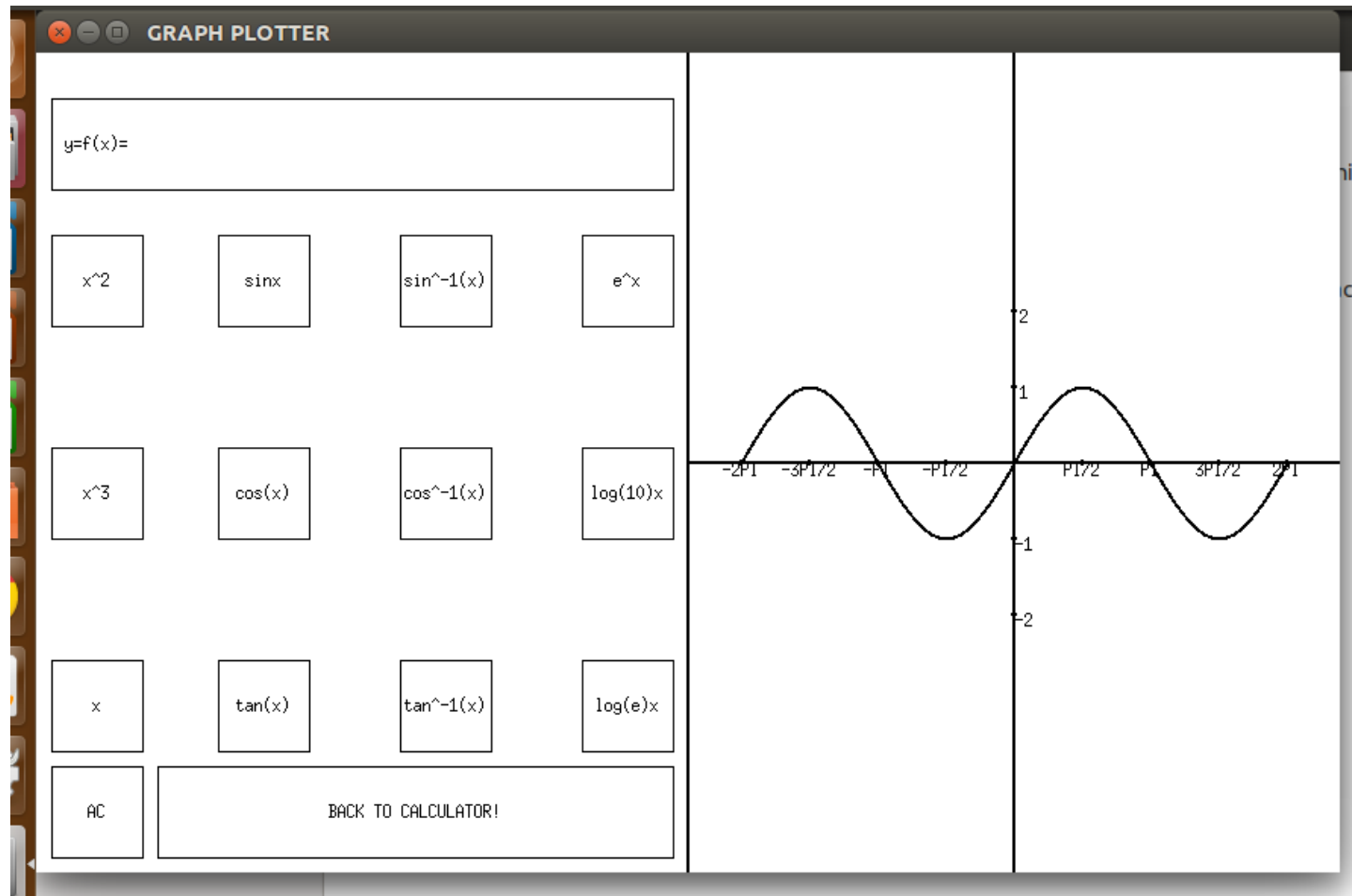- Multiple graphs can be plotted on a single graph sheet given.

# PROBLEM STATEMENT

- You will have to transform into terminal when you excess the operations coloured yellow and pink.

# SCREENSHOT OF CALCULATOR

| | | | | |
|---|---|---|---|---|
| OFF | ON | | | 7.000000 |

| + | x^2 | sin | cos | tan | 9 | 8 | 7 | 0 | AC |
|---|---|---|---|---|---|---|---|---|---|
| − | x^3 | sin^-1 | cos^-1 | tan^-1 | | | | | |
| * | x^-1 | !(fact) | nPr | nCr | 6 | 5 | 4 | . | DELETE |
| / | x^n | e | log(10) | log(e) | | | | | |
| ( | π(pi) | ) | deg | rad | 3 | 2 | 1 | EQUAL TO = | |

Misc Functions

| Matrix Solver | Unit Conversion | Statistics | Differentiation | Integration | Complex Numbers |
|---|---|---|---|---|---|

SWITCH TO GRAPH PLOTTER

# SCREENSHOT OF GRAPH PLOTTER

# VIDEO

Final Video.avi

# CHALLENGES

- 1. After completing the basic operations of the program,it was difficult to perform operations using the BODMAS rule.

- 2. After discussion with the T.A. we learned a new concept of Stack which involved postfix and infix expressions and their conversion.

- 3. It was difficult to represent multiple graph on single graph sheet.

- 4. This problem was solved by use of "**IMPRINT**" statement.

# INNOVATIONS

- 1) We provided user friendly interface.
- 2) All the basic operations which also include matrix equation solver, unit conversion etc.
- 3) Our code is compact and contains a proper use of stack, class, inheritance.
- 4) In graph plotter simultaneous graphs can be drawn on a single graph sheet which allows the user to study intersection, roots of the functions.
- 5) Software aiso provides commercial related operations like variance, standard deviations and calculation of simple/compound interest.

# FUTURE WORKS

- Operations involving 3D calculus like (calculating surface area, volume bound by revolution) can be added.

- The 3D graphs, polar graph can be included.

- Differential equation solver can be added to calculator, and the graph plotter can include direction field plotter.

- The help tag can be included which extends access to theories related to the topic and communication with the users using the software.

# FUTURE WORKS

- Easy sharing of drawn graphs through net can be included.