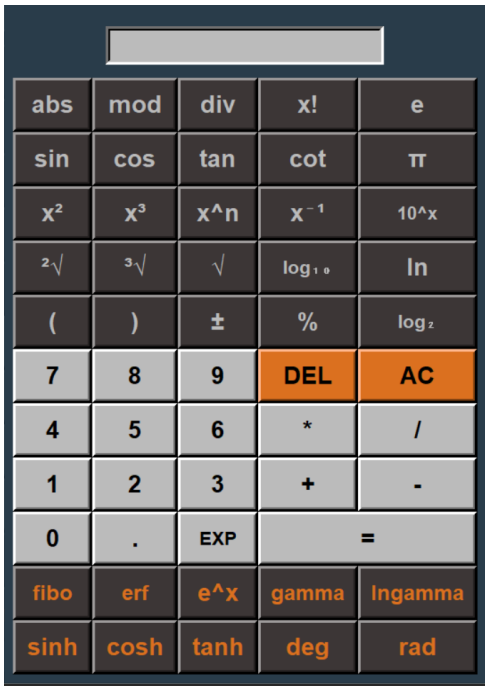
Tkinter Calculator

Scientific calculator using Python's library Tkinter



Some explanations for each button and the function which represents are the following :

- **1st Row**

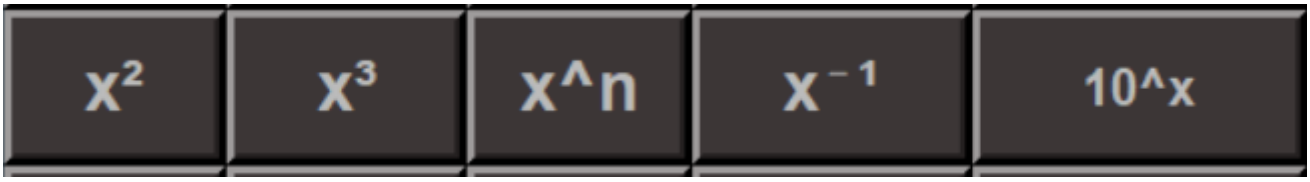
1. **abs** : The absolute value of a number (e.g. abs(-5) = 5).
2. **mod** : From *modulo*. it's the operation to find the remainder of the division of one number by another.
   In python we use the symbol % (e.g. 5mod2 = 5%2 = 1).
3. **div** : Floor division returns the result of the division rounded down to the nearest integer.
   In python we use the symbol // (e.g. 8div3 = 8//3 = 2).
4. **x!** : The factorial of the number x (e.g. 4! = 24).
5. **e** : The Euler's number. A mathematical constant approximately equal to 2.71828.

- **2nd Row**

1. **sin** : Sine of an angle θ in degrees (e.g. sin(90)=1).
2. **cos** : Cosine of an angle θ in degrees (e.g. cos(180)=-1).

3. **tan** : Tangent of an angle θ in degrees (e.g. tan(45)=1).
4. **cot** : Cotangent of an angle θ in degrees (e.g. cot(45) = 1/tan(45) = 1).
5. **π** : Archimedes' constant defined as the ratio of a circle's circumference to its diameter.
   It is approximately equal to 3.14159.

- **3rd Row**



1. **x^2** : x raised to the power of 2 (e.g. $4^2 = 16$).
2. **x^3** : x raised to the power of 3 (e.g. $5^3 = 125$).
3. **x^n** : x raised to any power (e.g. $2^4 = 16$).
4. **x^{-1}** : x raised to the power of (-1). The inverse of number x (e.g. $2^{-1} = 0.5$).
5. **10^x** : Powers of 10 (e.g. $10^3 = 1000$).

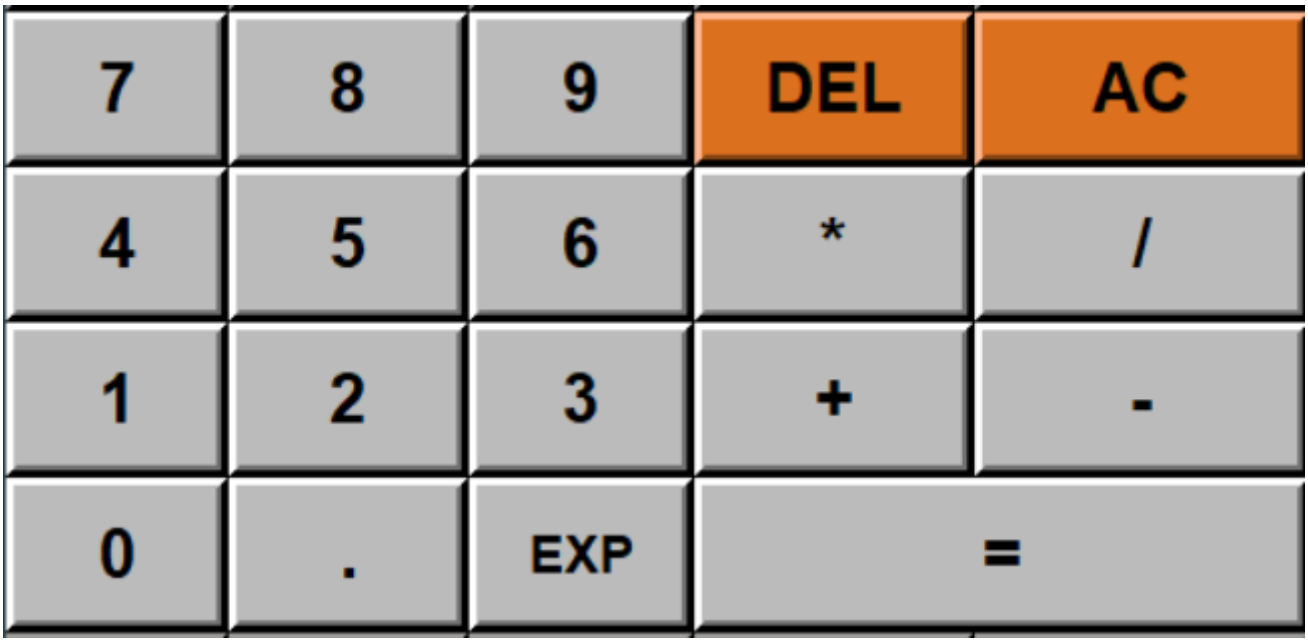
- **4th Row**

1. **$^2\sqrt{}$** : Square root of a number (e.g. $^2\sqrt{144} = 12$).
2. **$^3\sqrt{}$** : Cube root of a number (e.g. $^3\sqrt{8} = 2$).
3. **√** : Any root of a number (e.g. $^4\sqrt{16} = 2$).
4. **$\log_{10}$** : The logarithm of a number with base 10 (e.g. $\log_{10}1000 = 3$).
5. **ln** : The logarithm of a number with base e (e.g. $\log_e e = \ln e = 1$).

- **5th Row**

1. **(** : Left parenthesis.
2. **)** : Right parenthesis.
3. **±** : Change the sign of a number.
4. **%** : Find the percentage of a number (e.g. 5% = 0.05).
5. **$\log_2$** : The logarithm of a number with base 2.

- **6th,7th,8th,9th Row**



In these rows are :

-> The basic number buttons (0 to 9).
-> The basic math symbols (operators) (+, -, *, /).
-> The equal sign (=) and point (.).
-> Button **DEL** to delete one or more from the end of the entry.
-> Button **AC** to delete the whole entry.
-> **EXP** : Multiply any number with powers of 10 (e.g. 2 * 10 ** 3 = 2000).

- **10th Row**

1. **fibo** : The nth fibonacci number.
2. **erf** : The error function erf(x) of a number x.
3. **e^x** : Expotential function (e.g. e^2=approx 7.389).
4. **gamma** : The gamma(x) function of a number x.
5. **lngamma** : The ln(gamma(x)) function of a number x.

- **11nd Row**

1. **sinh** : Hyperbolic sine of an angle θ in degrees.
2. **cosh** : Hyperbolic cosine of an angle θ in degrees.
3. **tanh** : Hyperbolic tangent of an angle θ in degrees.
4. **deg** : Conversion of radians to degrees.
5. **rad** : Conversion of degrees to radians.

- You can copy/paste numbers from/to the calculator.
- For the factorial, trigonometic and logarithmic functions and functions of rows 10 and 11 you need to type or paste the number and then press the button.
- For windows users with intel CPU machines you can download the GUI executable from the bin folder.

Authors

- **Konstantinos Thanos**
- **Olga Tsiouri**