Infix Calculator

CSCI 112, Lab 4

File names: Names of files, functions, and variables, when specified, must be EXACTLY as specified. This includes simple mistakes such as capitalization.

Individual work: All work must be your own. Do not share code with anyone other than the instructor and teaching assistants. This includes looking over shoulders at screens with the code open. You may discuss ideas, algorithms, approaches, *etc.* with other students but NEVER actual code. Do not use code written by anyone else, in the class or from the internet.

Documentation: Each file should begin with a docstring that includes your name, the class number and name, the lab number, and a short description of the lab, as well as documentation pertinent to that particular file.

Addition and subtraction standard algorithm: You should be familiar with the standard algorithms for addition and subtractin, at least in base 10. If you are not familiar with other number bases, review them quickly here: `https://www.mathsisfun.com/numbers/bases.html`.

The standard subtraction and addition algorithms work fine in any base. You just have to remember that if you are in base 16, say, and you "borrow one" from the next column, you are borrowing 16, not 10. Likewise, if you carry one to the next column, you are carrying 16, not 10. Here are some worked examples to get the hang of things:

Base 10 examples:

$$\begin{array}{rrrrr} & 3 & 9 & 1 & 5 \\ + & 1 & 2 & 4 & 5 \\ \hline & 5 & 1 & 6 & 0 \end{array} \qquad \begin{array}{rrrrr} & 3 & 9 & 1 & 5 \\ - & 1 & 2 & 4 & 5 \\ \hline & 2 & 6 & 7 & 0 \end{array}$$

Base 8 examples:

$$\begin{array}{rrrrrr} & & 7 & 5 & 1 & 3 \\ + & & 2 & 3 & 3 & 5 \\ \hline & 1 & 2 & 0 & 5 & 0 \end{array} \qquad \begin{array}{rrrrr} & 7 & 5 & 1 & 3 \\ - & 2 & 3 & 3 & 5 \\ \hline & 5 & 1 & 5 & 6 \end{array}$$

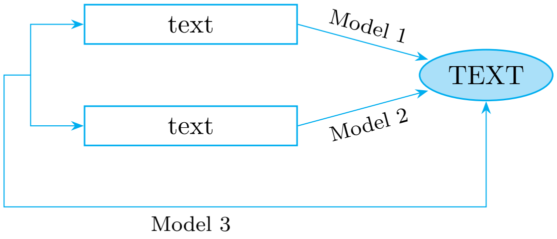
Base 16 examples:

$$\begin{array}{rrrrr} & & 15 & 4 & 11 \\ + & & 4 & 13 & 13 \\ \hline & 1 & 4 & 2 & 8 \end{array} \qquad \begin{array}{rrrr} & 15 & 4 & 11 \\ - & 4 & 13 & 13 \\ \hline & 10 & 6 & 14 \end{array}$$

If you want more examples, just run my program `arithmetic.py` and paste the output into a new project on `https://www.overleaf.com`.

You can get easy base 8 and base 16 examples from python:

```
>>> hex(0xaaa + 0x123)
'0xbcd'
>>> oct(0o666 + 0o123)
'0o1011'
```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Model 1
Model 2
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Model 3