Outstanding Work Challenge: Keen / KenKen

Eckel, TJHSST AI1, Fall 2019

# Background & Explanation

We’ve been solving Sudoku puzzles. A related puzzle that makes a delightful coding exercise is to solve Keen or KenKen puzzles. On Simon Tatham’s website, you can find the game “Keen”; elsewhere, google “KenKen”. This handout does **not** explain the rules, so read the rules yourself and feel free to ask if you have any questions!

# Required Task

You can solve this puzzle any way you want. There are no rules about data structure or method (except for the usual stipulations that you can’t google a solution or import any non-standard libraries). It just has to work. The default size on Simon Tatham’s page is 6x6, but I’ll ask you to go a bit bigger. “7x7 Unreasonable”, in the custom game selector, will be the most difficult puzzle I generate. I will also use some smaller test cases to make sure you aren’t hardcoding that.

The input convention will go like this. Every arithmetic constraint set will be given a letter. Then, after the puzzle string, each letter will be matched to the constraint on that set. For example, see this puzzle and its text file representation:

A close up of a screen

Description automatically generated

AABBCCDDECFFEGGF

A 2 /

B 1 –

C 6 x

D 8 x

E 1 –

F 5 +

G 2 /

# Specification for Outstanding Work

Submit a single Python script to <https://tinyurl.com/F19EckelKeen>.

This assignment is **complete** if:

* The “First Name” field on the Dropbox submission form contains your **class period**, not your name.
* The “Last Name” field on the Dropbox submission form contains your **last name then a comma then your first name** (like, for example, “Eckel, Malcolm”).
* Your code does all of the following:
  + Accept one **command line argument** – the name of a file.
  + Read **one puzzle** out of the file, with formatting as specified above.
  + Output a single string (just like sudoku) of the solution to the puzzle.
* Total runtime is less than 2 minutes (ie, ensure that a single 7x7 Unreasonable puzzle runs in under a minute).

For **resubmission**:

* Complete the specification correctly.