Brief manual: PsQ_GUI

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NB: this is just a (preliminary) demo version for illustration.
(some bugs & imperfections are still lurking in the code)

Make sure the following files are downloaded to the same directory:

- ◇ PsQ_Grid.py
- ◇ PsQ_GridCollection.py
- ◇ PsQ_GUI.py
- ◇ multiple_k_solver_pow3b.keras
- ◇ sudoku_data_pow3b.npy

Make sure tensorflow and numpy are installed

⇒ run PsQ_GUI.py in the IDE of your choice

The following comments give you a brief orientation:

Top:

- Right-hand side:
  - Select Dimension (r, c, R, C) and/or Position (1, 2, 3)
  - "Get Permutations" → loads the corresponding 6 grid permutations (first permutation group already pre-loaded)
- Left-hand side:
  - "Next Permutations" → displays the next grid permutation from the current group

- "Rotate" → 90°clockwise
- "Diaflect" → »Diagonal Reflection« ∼ matrix transposition

- "Alphabetize" → generates and displays an abc grid;
  key: top row ⇔ (A B C D E F G H I)
- "Recode" → generates and displays an integer grid;
  key: top row ⇔ encoder

Comments:

(i) Grid permutations: $3!^8 = 1{,}679{,}616$

(ii) Rotations are contained in these permutations, and don't contribute new grids

(iii) Diaflection is not contained; when added to Grid permutations: 2 x 1,679,616 = 3,359,232

(iv) Every grid in this permutation collection can be alphabetized; every abc-grid can be recoded in 9! = 362.880 ways

⇒ Every single grid gives rise to 3,359,232 x 362.880 $\sim$ 1.22 x 10^{12} grids!
through a series of simple manipulations.
don't attempt to produce them manually, though ;)

Bottom:

- "FetchGameGrid for Demo" → opens dialog asking for number k of blanks
  → loads a Sudoku puzzle with k blanks
- "IA-Solver" → pre-trained model attempts to solve the puzzle
  keep pushing the button until messagebox announces the result
- "RandomGrid Generator" → generates a (valid) grid from random initialization
  NB: can take from 15 sec – 15 min!
- "Get Collection" → several dialog boxes asking for input
  → generates a collection (various options) and stores it in the current directory

PS: comments and feedback are always welcome!