



Rubik's Cube Solving Challenge

[HumanEd](#) is the Humanoid Robotics Society of UoE. One of our subprojects is solving the Rubik's Cube using a Biomimetic Hand. As inspiration coming from our project, we have decided to prepare a Rubik's Cube solving challenge!

Basically, Rubik's Cube solving is an algorithmic problem that can be addressed using different solving strategies. Each algorithm has its own advantages, we would like to see your implementations of algorithms. We would like you to use the notation below for our own testing of your algorithm, but innovative and more efficient representations are also welcome as an add-on! Our main criterion is the efficiency of the algorithm in the meaning of steps that should be taken to solve the cube. Besides this, we would like to see your unique approaches to notation and representing the states of the cube.

!!!Using a ready-to-use solver is not permitted. Python can go "brrr" without "pip install [InsertSolverName]". Other packages for visualization and notation are encouraged.!!!

EXAMPLE

Color representation:

- b = [b]lue r = [r]ed
- w = [w]hite y = [y]ellow
- o = [o]range g = [g]reen

exampleCube =

'wowgybwyogygybyoggrowbrgywrborwgybrbwororbwborgowryby'

Unfolded Cube: (Setting the center colors of your cube implementation to a similar setting as exampleCube might be helpful e.g. 4 is yellow)

```
-----  
| 0 | 1 | 2 |  
-----  
| 3 | 4 | 5 |  
-----  
| 6 | 7 | 8 |  
-----
```

```
-----  
| 9 | 10 | 11 | 18 | 19 | 20 | 27 | 28 | 29 | 36 | 37 | 38 |  
-----  
| 12 | 13 | 14 | 21 | 22 | 23 | 30 | 31 | 32 | 39 | 40 | 41 |  
-----  
| 15 | 16 | 17 | 24 | 25 | 26 | 33 | 34 | 35 | 42 | 43 | 44 |  
-----  
  
-----  
| 45 | 46 | 47 |  
-----  
| 48 | 49 | 50 |  
-----  
| 51 | 52 | 53 |
```

Solution Notation Example:

<https://ruwix.com/the-rubiks-cube/notation/>

Solution 1 of the given cube:

[F', R, U', R', U, U, F2, Y, B', U, B, U, F2, Y, R', F', U, F, R, U, U, U, F2, Y, L, F, U', F', L', U, F2, Y, L', U, L, U', U, F', U, F, U, F', U2, F, Y, U, Y', R', U', R, U2, R', U', R, U, R', U', R, Y, Y, B, U, B', U, F', U2, F, U, F', U2, F, Y, U2, U', R, U, R', U, R, U, R', Y, Y, R', F, R, U, R', F', R, Y, L, U', L', U, Y, Y, Y, Y, U, Y, Y, Y, Y, U, Y, Y, R, U', R, U, R, U, R, U', R', U', R2]

Solution 2 of the given cube

[L', F, B2, R', B, R', L, B, D', F', U, B2, U, F2, D', R2, L2, U, F2, D']

Solution 2 is much more efficient!