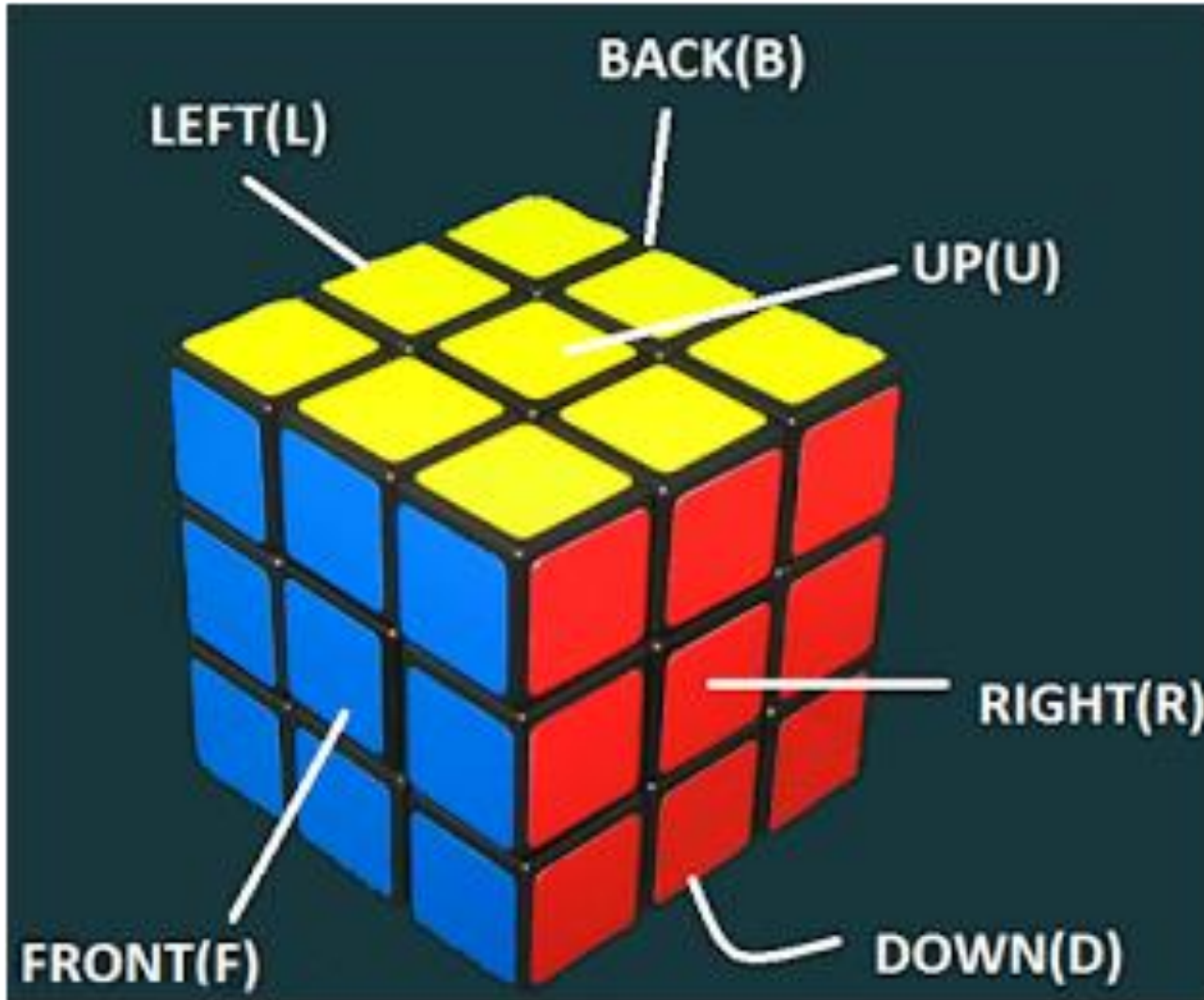


3*3 RUBIK's Cube Phases & Components



Edge Pieces (bicolored)
12 pieces

Center Pieces (monocolored)
6 pieces

Corner Pieces (tricolored)
8 pieces

Center Piece colors are always opposite to each other

- WHITE opposite YELLOW
- ORANGE opposite RED
- GREEN opposite BLUE

Founder : Erno Rubik



Cube Name: Magic Cube

Year:1974

Place: Hungary

Founder Profession:

Sculptor & professor of architecture.

Purpose: For teaching Architecture & design spatial relationships in 3D to his students

“Complex things, if you don’t understand them, it seems complicated. If you understand them & we know how to handle it, it became simple”.

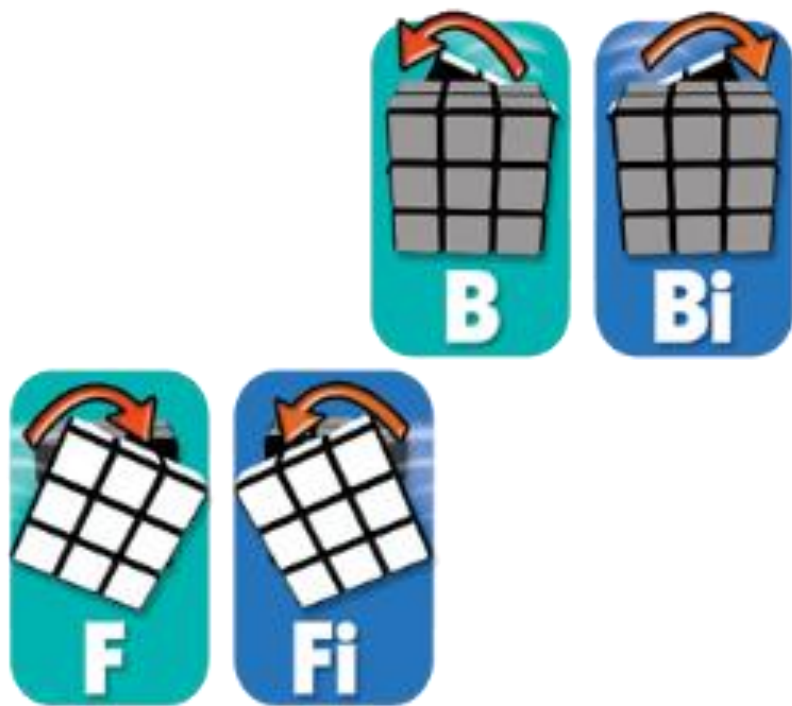
-Erno Rubik

“Complex things, if you don’t understand them, it seems complicated. If you understand them & we know how to handle it, it became simple”.

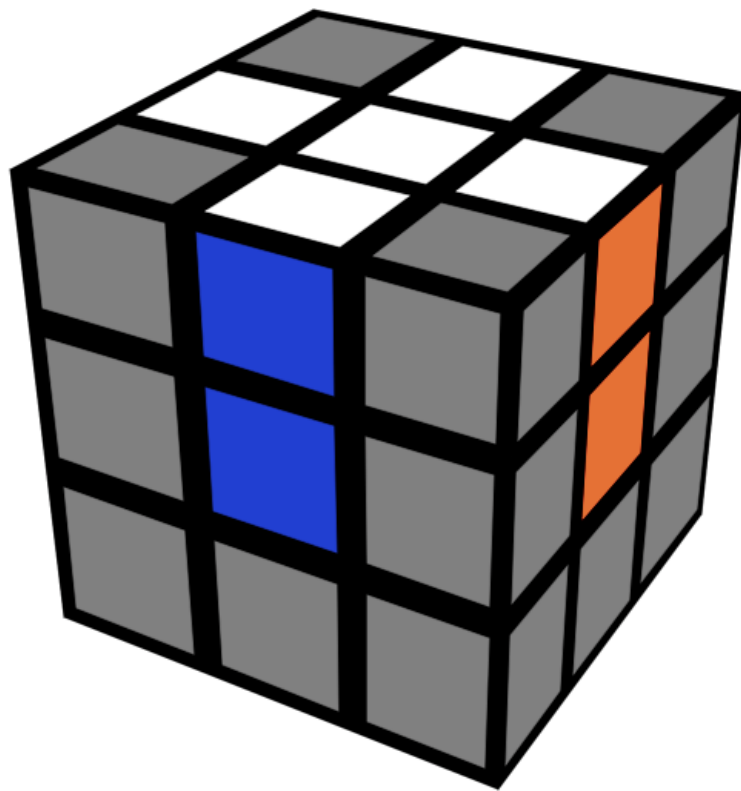
-Erno Rubik

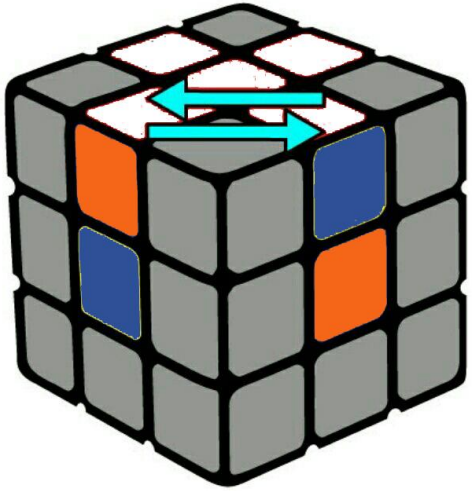
Notations to be known:

$\frac{3}{4}$ th cube can be solved : CC
90 degree rotation
I - Inverted , prime , dash



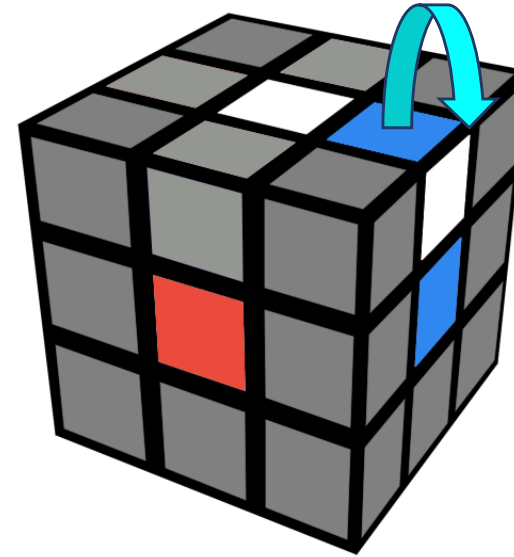
Step 1: Solving the white Cross





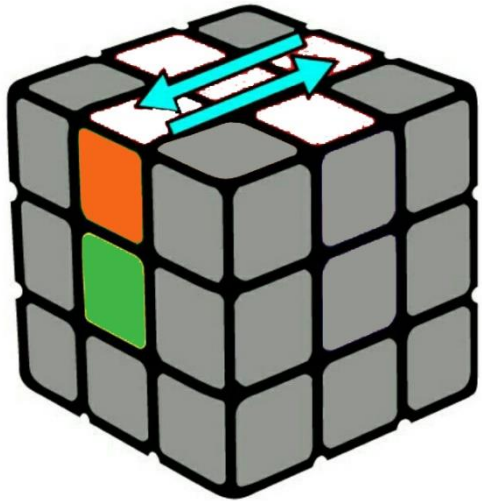
Switching 2 adjacent edges

$R_i U_i R U R_i$



Inverted edges

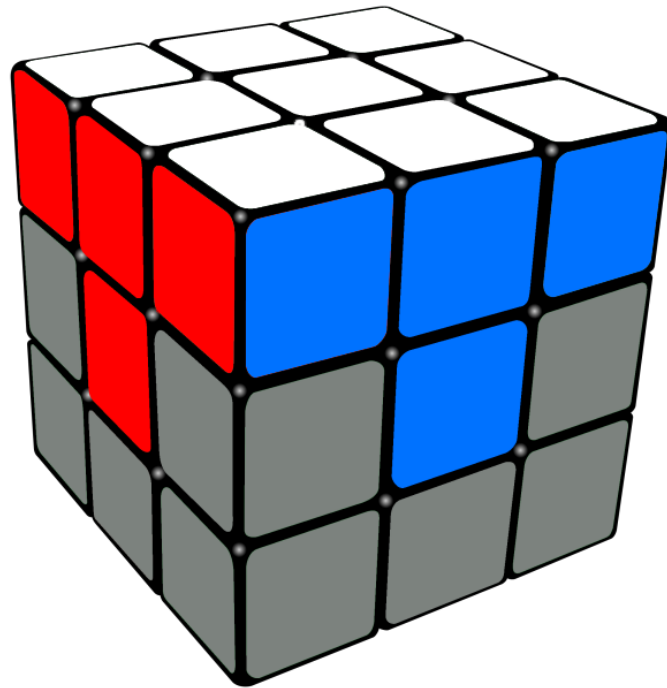
$R_i U F_i U_i$

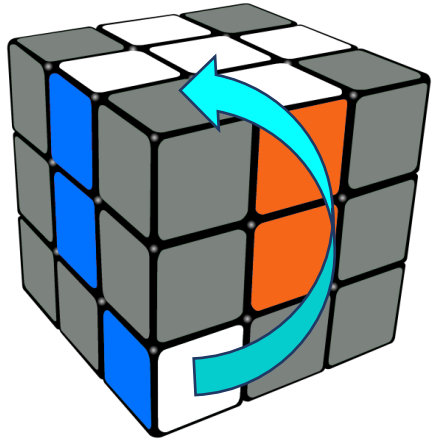


Switching 2 parallel edges

$F U_i^2 F_i U_i^2 F$

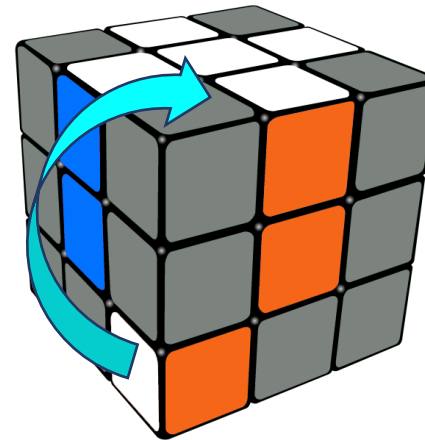
Step 2: Solving the white Corners





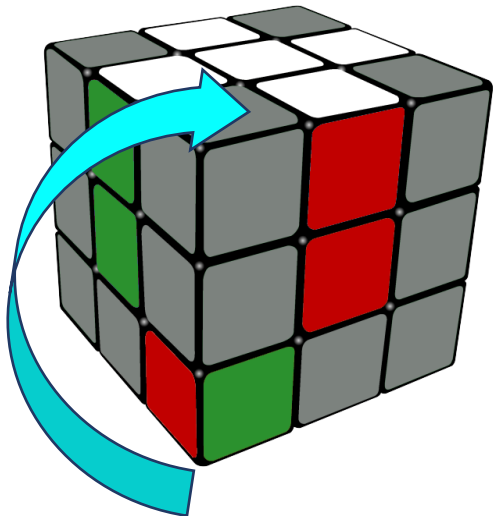
Corner part of the top layer
is on the bottom right face

D F Di Fi



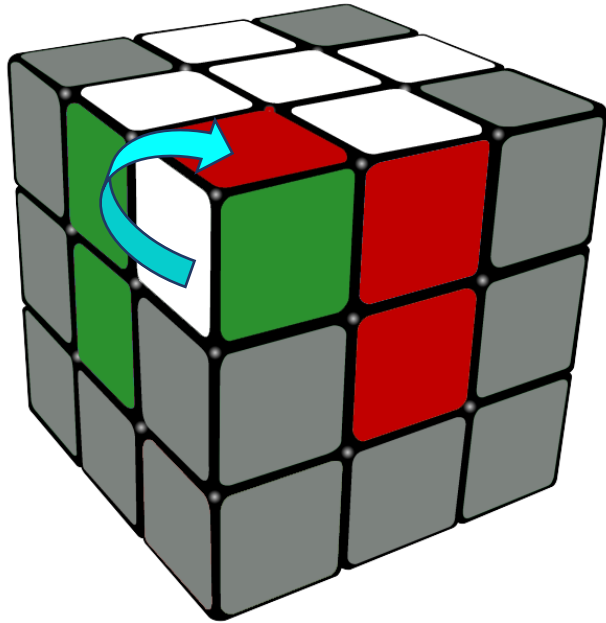
Corner part of the top layer
is on the bottom left face

Di Ri D R



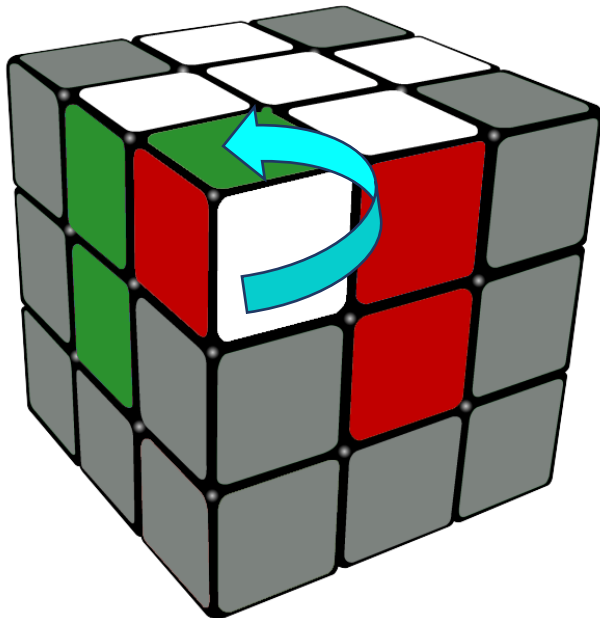
Corner part of the top
Layer is on the bottom

Ri D R F D2 Fi



Corner part of the top layer
Is on the top left face

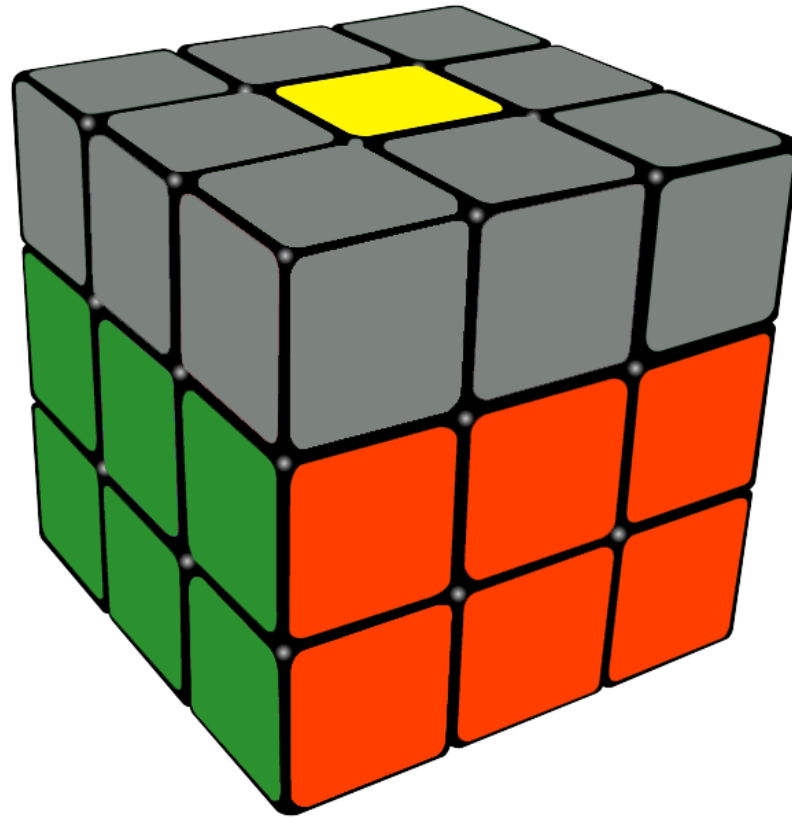
F D2 Fi Ri D2 R

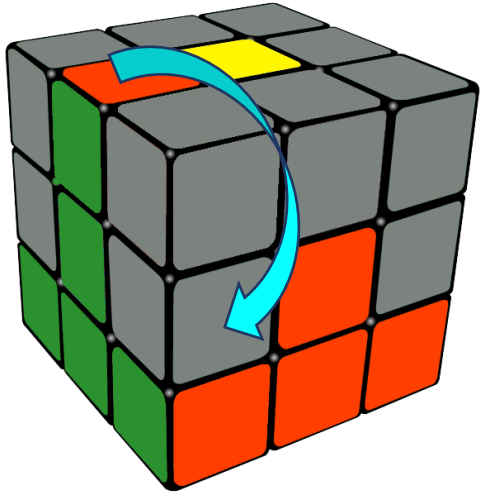


Corner part of the top layer
Is on the top right face

Ri Di2 R F Di2 Fi

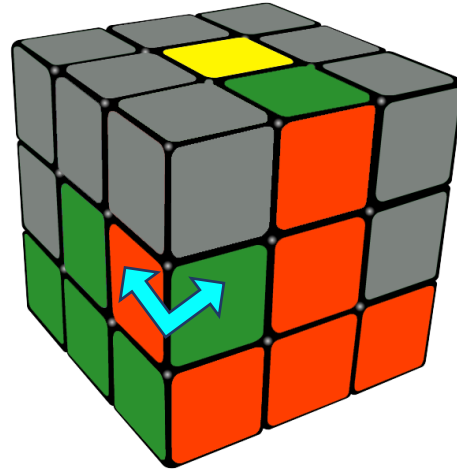
Step 3: Solving the Middle layer





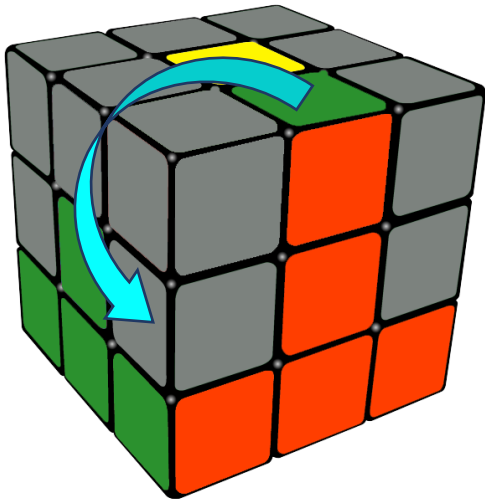
When the edge part is in the left face

U R Ui Ri Ui Fi U F



When the edge part color is inverted

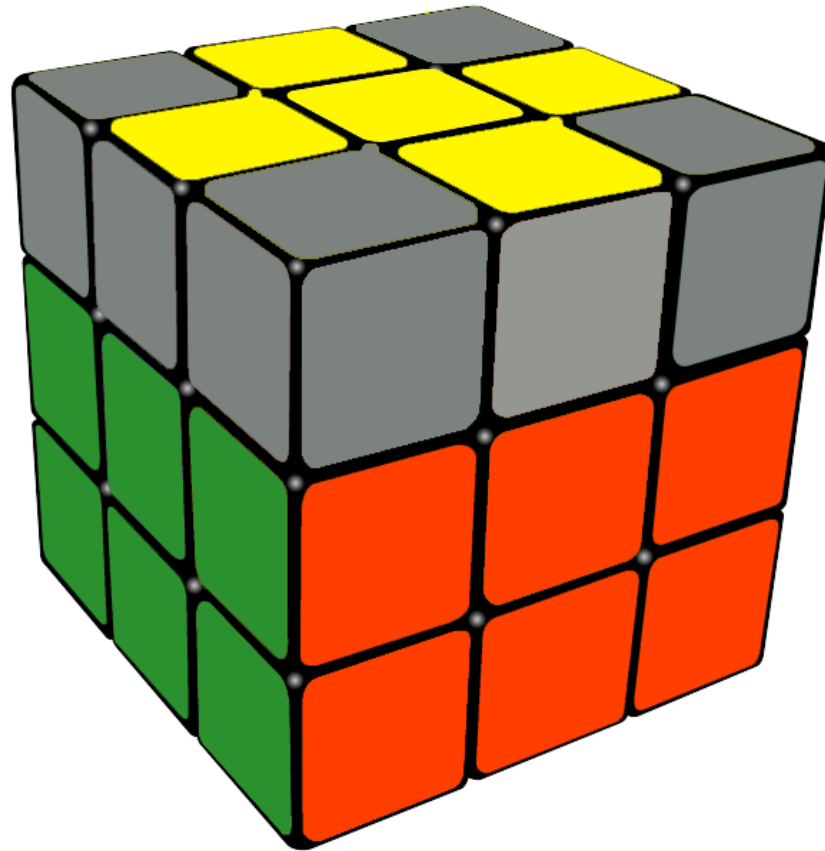
U R Ui *Ri* Ui Fi U F
Ui R Ui Ri Ui Fi U F

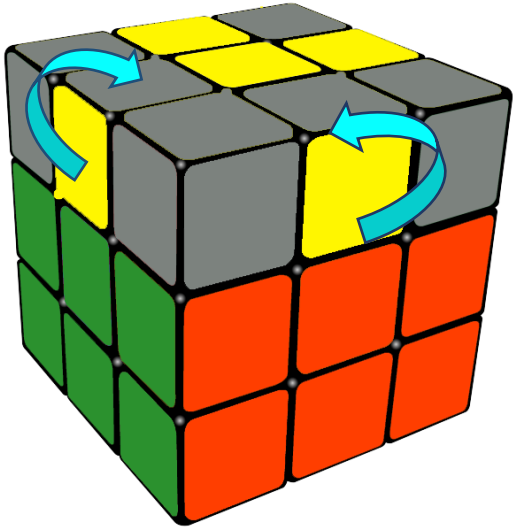


When the edge part is in the right face

Ui Fi U F U R Ui Ri

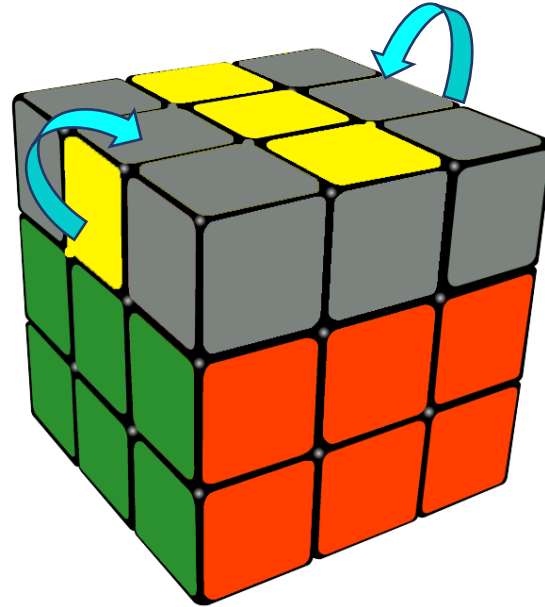
Step 4: Solving the Top layer with yellow cross





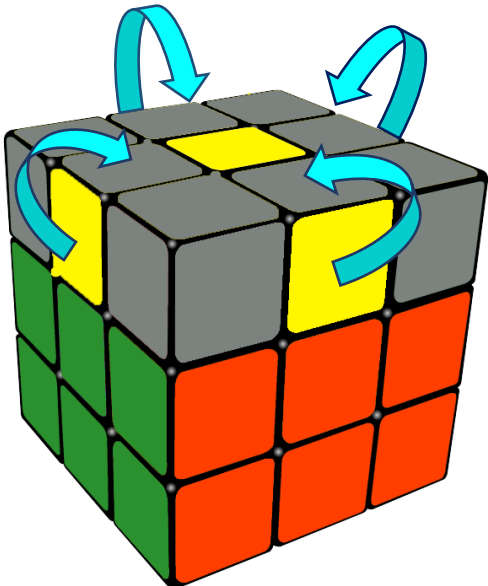
When 2 edges are only adjacent

F U R Uⁱ Rⁱ Fⁱ



When 2 edges are only parallel

B L U Lⁱ Uⁱ Bⁱ

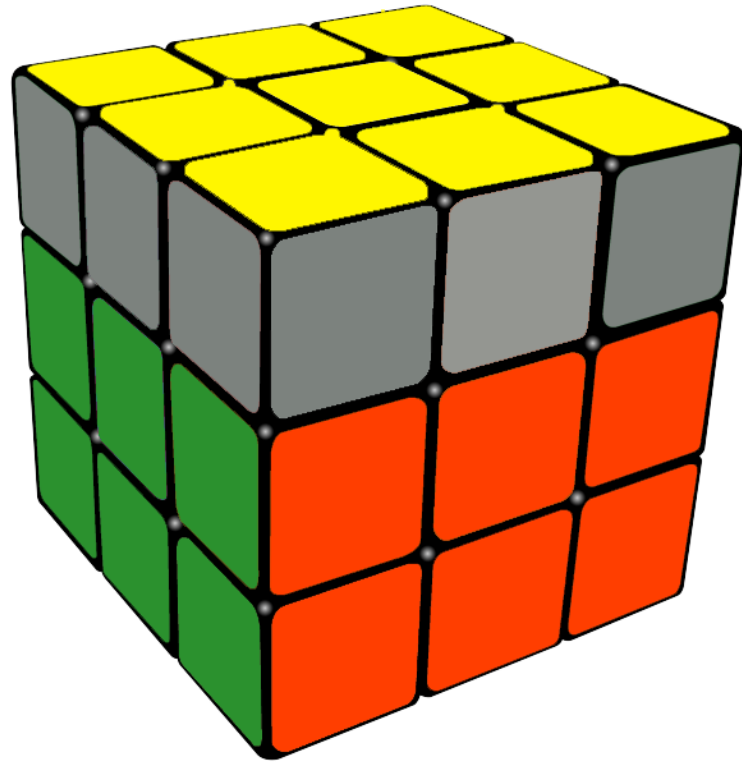


When 2 edges are both parallel & adjacent

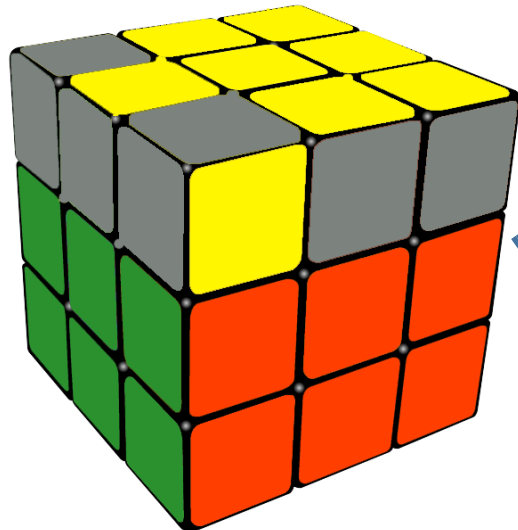
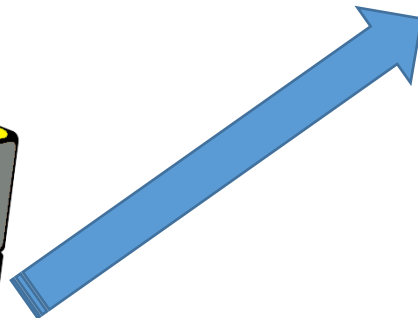
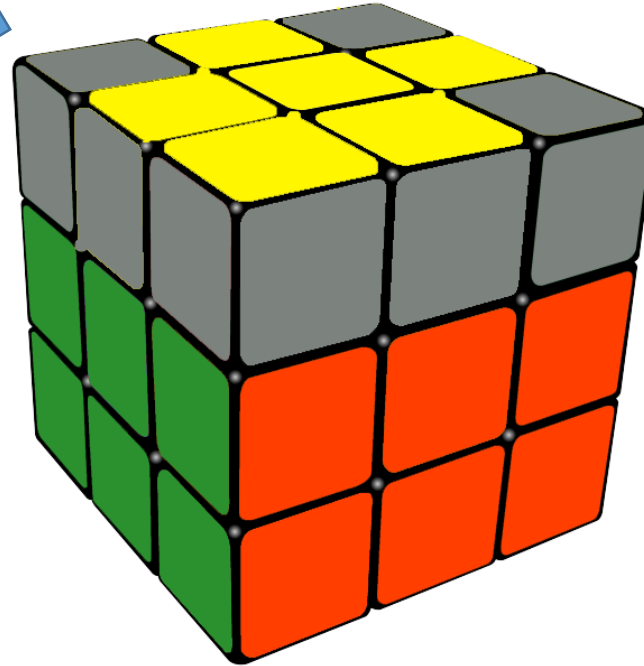
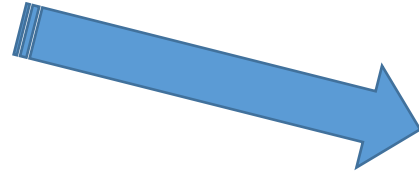
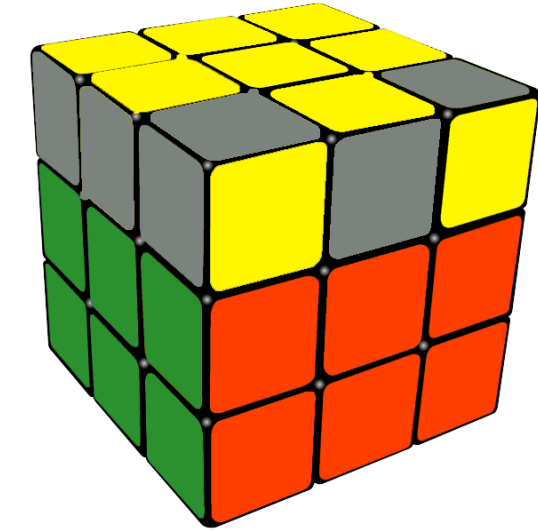
B L U Lⁱ Uⁱ Bⁱ

F U R Uⁱ Rⁱ Fⁱ

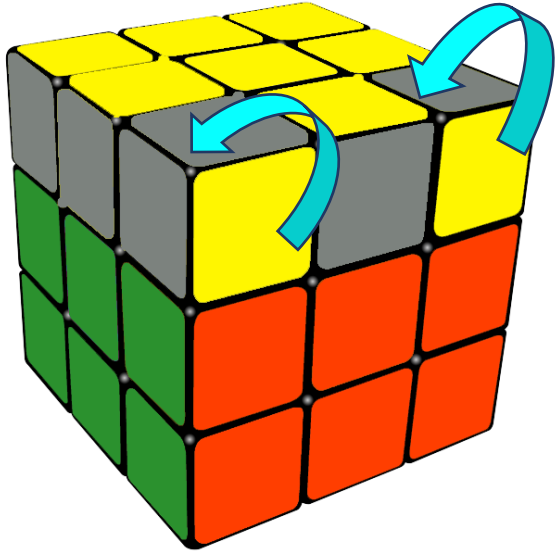
Step 5: Solving the Top layer with yellow colored



Keep the cube in those alignments & repeat those moves until either the three rows gets fully yellow

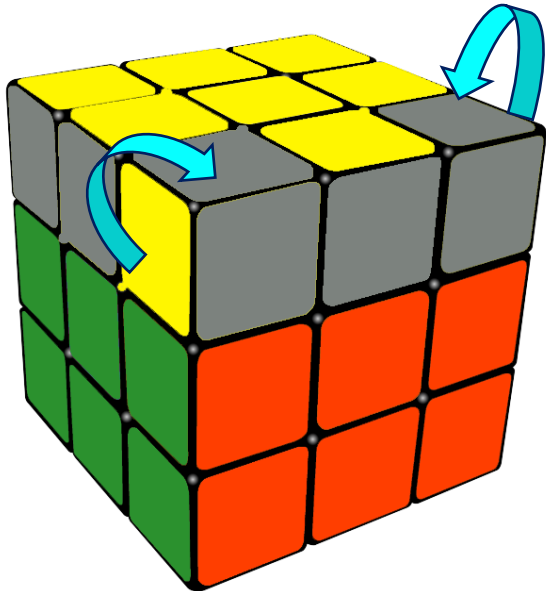


R U Ri U R U2 Ri



When 2 corners are in same face

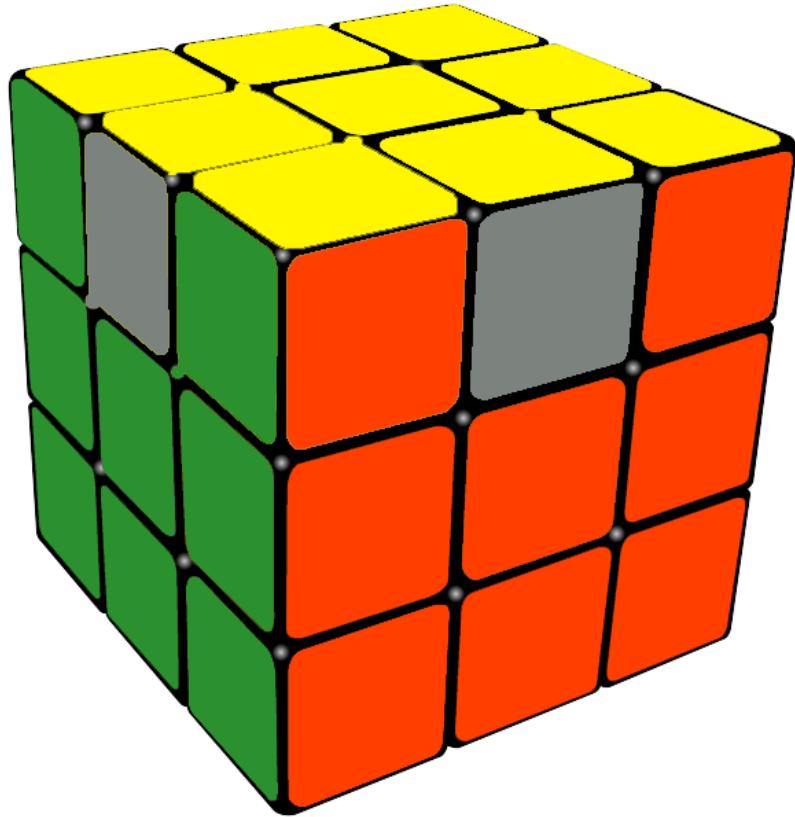
L D_i L_i F_i D_i F U F_i D F L D L_i U_i



When 2 corners are in parallel face

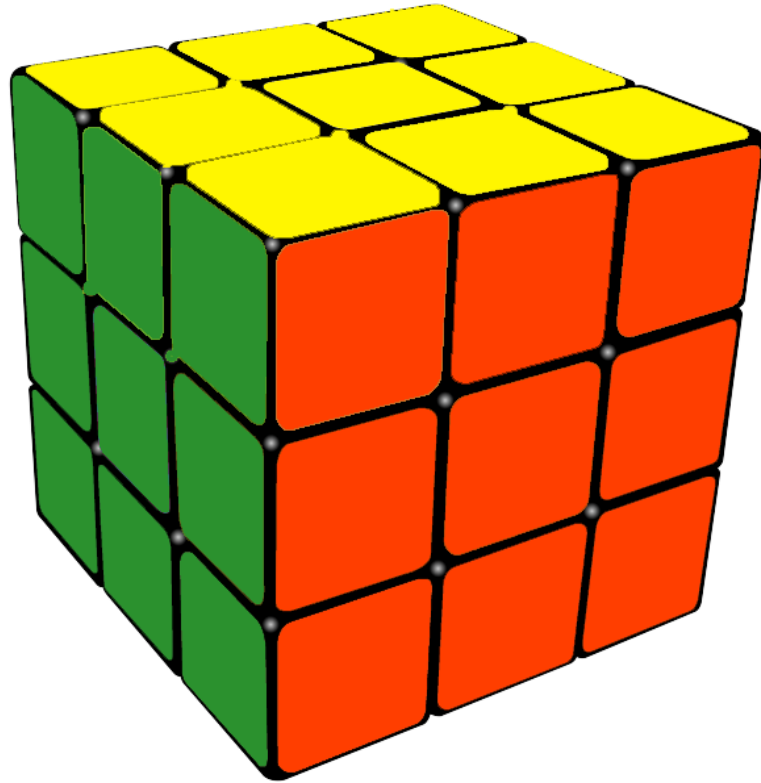
R B_i R_i U_i B_i U F U_i B U R B R_i F_i

Step 6: Solving the yellow corners



Ri F Ri B2 R Fi Ri B2 R2 Ui

Step 7: Finishing up the cube



F2 U L Ri F2 Li R U F2

Amazing Fact:

There are 43×10^{17} possible moves
ie...**43 Quintillion** combinations

Additional information:

❖ **2*2 Cube can be solved easily** using some of the same moves as done in 3*3 Cube

❖ Try CubeX android app available in Playstore



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CubeX - Rubik's Cube Solver

Divins Mathew Puzzle Creativity

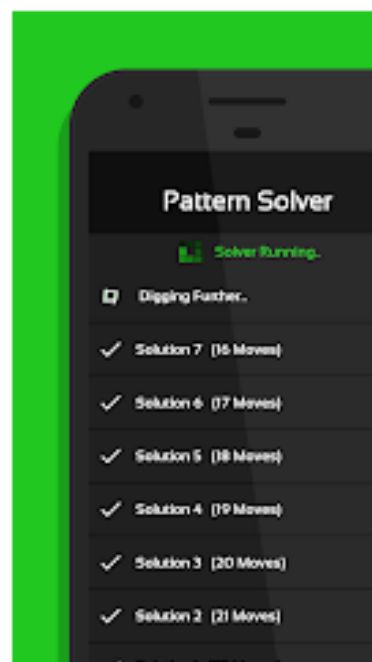
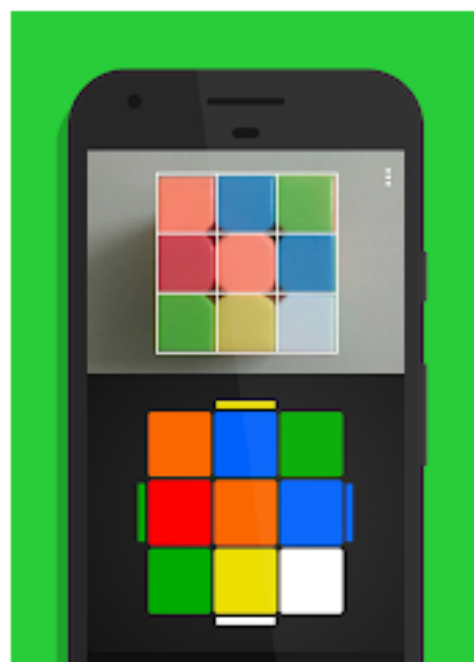
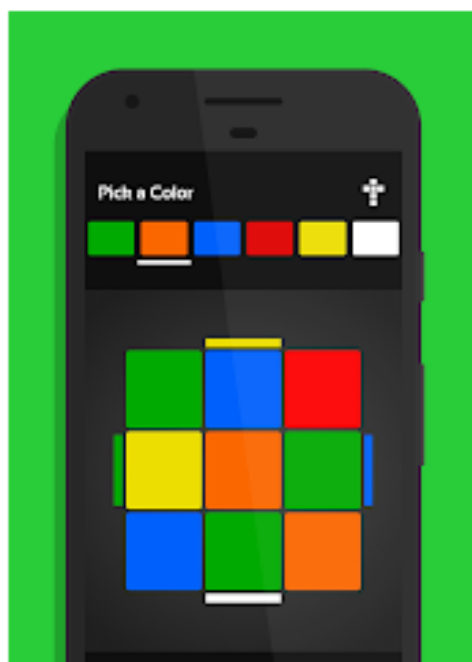
★★★★★ 13,644

3+ Family Friendly

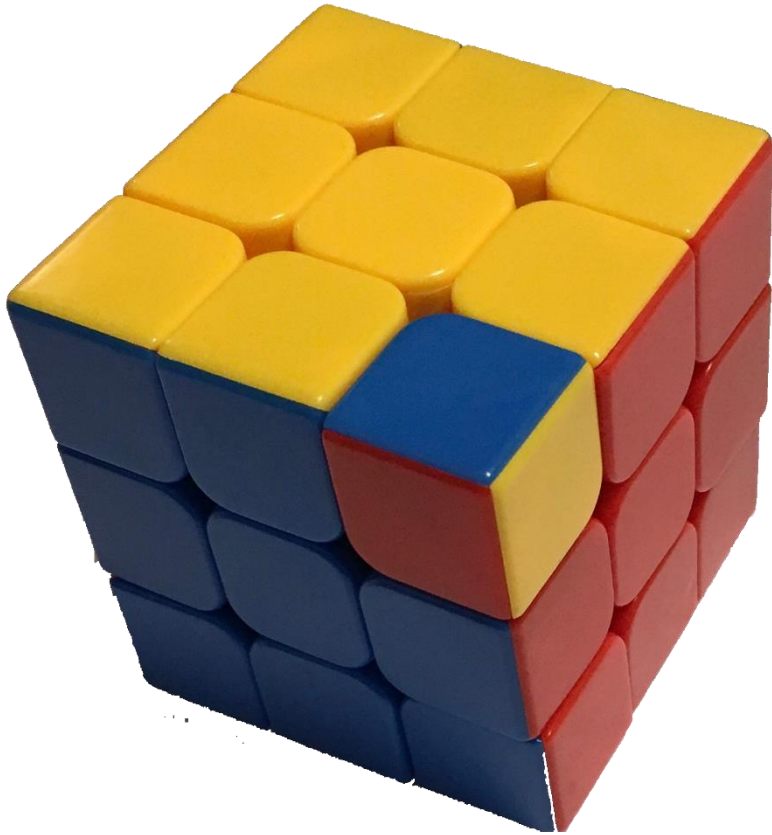
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Additional Tip:



Rotating only 1 corner of the cube in the last layer is **IMPOSSIBLE**.

ie...Cube is in an unsolvable state.

While speedy cubing there are some chances of improper displacement of pieces .You must take apart the cube and fix the corner which is the disoriented piece.

Approximate Time Taken for each steps:

Step 1 & 2 : 47 - 60 seconds

Step 3 & 4 : 47 - 60 seconds

Step 5, 6 & 7 : 49 - 60 seconds

Min - Max avg : 143 - 180 seconds

Now you can solve 3*3

Rubik's Cube within

180 seconds 😊