

CFOP

(精选顺手公式，多用对称，减少公式记忆量)

三叶虫

步骤介绍

CFOP 法共分四步：

- (1) 在底层架好十字(CROSS)
- (2) 完成前两层(F2L)
- (3) 顶面颜色统一(OLL)
- (4) 完成顶层(PLL)



字母介绍

F,B,L,R,U,D 分别代表魔方的前,后,左,右,上,下六个面(与颜色无关，只表示位置)

即：英文的 Front, Back, Left, Right, Up, Down。

拧法介绍

一个字母代表顺时针转 90 度，字母加 “'” 表示逆时针转 90 度，加 “2” 表示转 180 度

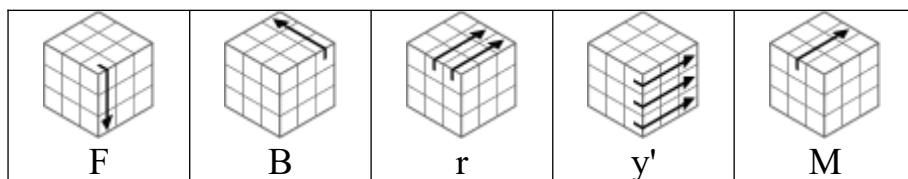
单层转：F、B、L、R、U、D，F'、B'、L'、R'、U'、D'，F2、B2、L2、R2、U2、D2

两层转(单层转的同时中间层一起转)：f、b、l、r、u、d，f'、b'、l'、r'、u'、d'，f2、b2、l2、r2、u2、d2

整体转(三层转)：x、y、z，x'、y'、z'，x2、y2、z2【方向对应为 x-R，y-U，z-F】

转中层：M、M'、M2 (M 的方向同 R)

图示：



注：顺、逆指面对该面看时的转向，故对于 B、B'、L、L'、D、D'的转向要特别小心。

第一步、底层架十字(CROSS)

这一步较简单，自己领悟。

4 个棱块复位后是这样



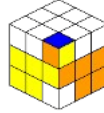
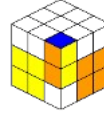
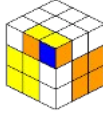
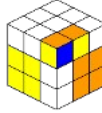
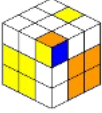
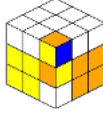
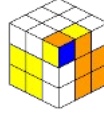
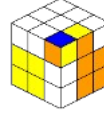
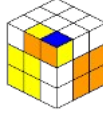
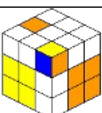
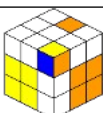
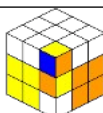
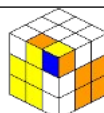
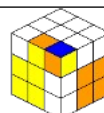
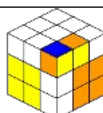
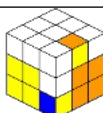
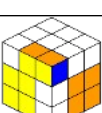
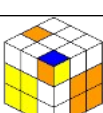
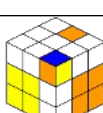
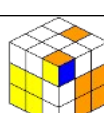
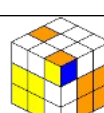
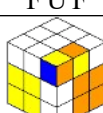
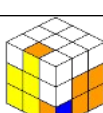
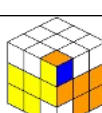
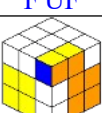
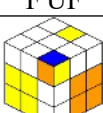
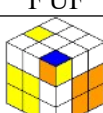
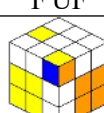
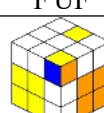
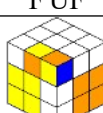
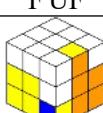
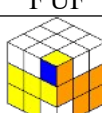
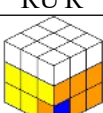
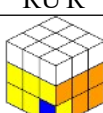
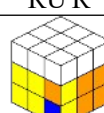
的

不要是这样



第二步、完成前两层(F2L)

共有 41 种情况

 U'F'UF URU'R'	 URU'R' U'F'UF	 (RU2R'U')2 F'UF	 (RUR'U')2 RUR'	 RU'R' F'U2F		 RBL U' L'B'R'	 F'L'B' U BLF
 RUR'	 U2RU'R'U' RUR'	 UF'U'FU' RUR'	 U'RU'R'U' RUR'	 RU'2R'U' RUR'	 RUR'U'2 RUR'U' RUR'	 U' RUR'U' RUR'	
 F'UF	 U'2F'UFU F'UF	 U'RUR'U' F'UF	 UF'UFU' F'UF	 F'U2FU F'UF	 F'U'FU2 F'U'FU F'UF	 U F'UFU F'UF	
 U' F'UF	 U'F'U2FU' F'UF	 U2F'U'FU' F'UF	 UF'U2FU2 F'UF	 UF'U'FU2 F'UF	 (F'UFU')2U' F'UF	 F'UFU' F'UF	 U F'UFU'2 F'UF
 U RU'R'	 URU'2R'U' RU'R'	 U2RUR'U' RU'R'	 U'RU'2R'U'2 RU'R'	 U'RUR'U'2 RU'R'	 (RU'R'U')2U RU'R'	 RU'R'U' RU'R'	 U'RU' R'U'2 RU'R'
	 RUR'U'2 RU'R'U' RUR'	 F'U'FU2 F'UFU' F'UF	 RUR'U' RU'R'U'2 F'UF	 F'U'FU F'UFU'2 RUR'			

紫色 为需要首先记住的基本公式。

蓝色 为 4 种基本情况，首先掌握。

红色 为 2 个特殊公式

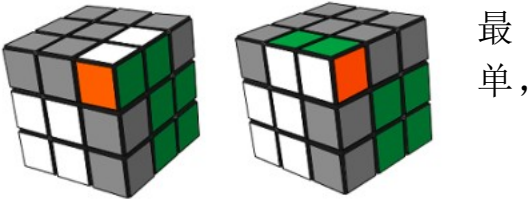
每一行为一组(第一行除外)，这一组每个公式最后的步骤与本行的第一个公式相同(分组原则)。

第 2 行与第 3 行上下对应的是对称的情况。

第 4 行与第 5 行上下对应的是对称的情况。

第 6 行与 4、5 行归为一类(装不下了…)

注：这一步给出的公式中有部分并不是对应的情况的简公式，只是便于理解和顺手的公式。本步其实非常简



不要一看到有这么多公式就头疼。需要理解这些公式的原理：让角块和棱块通过转动后组合到一起(右图)，然后把它们放到正确的位置。

第三步、顶面颜色统一(OLL)

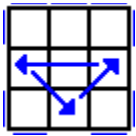
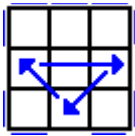
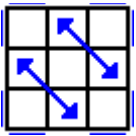
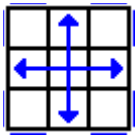
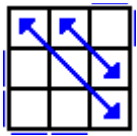
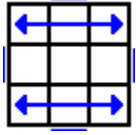
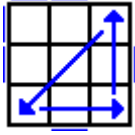
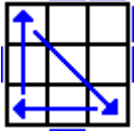
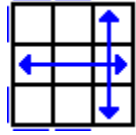
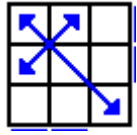
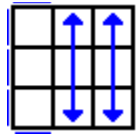
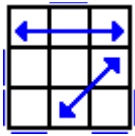
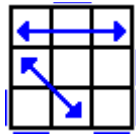
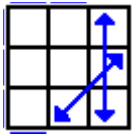
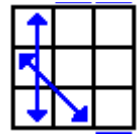
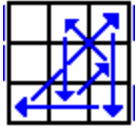
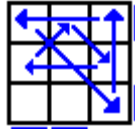
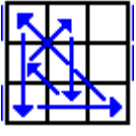
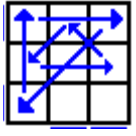
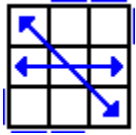
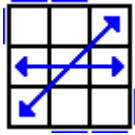
共有 57 种情况

23 R2D' RU'2 R'D RU'2R	21 RU'2 R'U'RUR'U' RU'R'	22 RU'2 R2U' R'2U' R2U'2R	24 rUR'U' r'FR F'	25 F' rUR'U' r'FR	26 R'U'RU' R'U'2R	27 RUR'U RU'2R'	
45 F (RUR'U') F'	44 f (RUR'U') f'	43 f' (L'U'LU) f	2 F(RUR'U')F' f(RUR'U')f'	3 f(RUR'U')f' U' F(RUR'U')F'	4 f'(L'U'LU)f U F'(L'U'LU)F	12 FRUR'U'F' U FRUR'U'F'	11 F'L'U'LUF U' F'L'U'LUF
48 F (RUR'U')2 F'	47 F' (L'U'LU)2 F	51 f (RUR'U')2 f'	1 RU'2 R'2FRF' U2(R'FRF')	17 RUR'U R'FRF'U2 R'FRF'	18 F(RUR'd) R'U2 R'FRF'	19 r'(RU)2 R'U'r R'2 FRF'	20 r'(RU)2 (R'U' r'2R'2) (URU')r'
49 F'RU'2RU'2 R'F2RF'	50 FL'U'2LU'2 LF2L'F	33 RUR'U' R'FRF'	37 F(RUR'R'U') RUR'F'	35 RU'2R'2 FRF' RU'2R'	46 R'U' R'FRF' UR	57 RUR'U'r R'URU'r'	28 rUR'U' r'RU RU'R'
34 R'U'RU y(rUR'U')M'	52 R'U'RU' R'd R'URB	55 R U'2R'2 U'RU'R'U'2 FRF'	56 F(RUR'U') RF' rUR'U'r'	6 r U'2 R'U'RU' r'	5 l'U2 LUL'U l'	7 rUR'U RU'2 r'	8 l'U'LU' L'U2 l
40 R' (FRUR'U'F') UR	39 L (F'L'U'LUF) U'L'	14 R'FRUR' F'R FU'F'	13 LF'L'U'L FL' F'UF	54 rU'2 R'U'RUR'U' RU'r'	53 l'U2 LUL'U'LU L'U l	29 R'FRF' RU'2R'd' L'U'L	30 LF'L'F L'U2Ld RUR'
10 RUR'U R'FRF' RU'2R'	9 L'U'LU' LF'L'F L'U2L	38 RUR'U RU'R'U' R'FRF'	36 L'U'LU' L'ULU LF'L'F	16 rUr' RUR'U' rU'r'	15 l' U' l L'U'LU l' U l	32 (RU)(B'U') (R'U RBR')	31 (L'U')(BU) (LU' L'B'L)
41 RU'R'U2 RUyRU'	42 L'ULU'2 L'U'yL'U						

R'UF'	LUF						
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第四步、完成顶层(PLL)

共有 21 种情况

U:a  RU'(RURUR) U'R'U'R'2	U:b  L'U(L'U'L'U'L') ULUL2	Z  U MU' M2U'M2U' MU2M2	H  M2U' M2U'2 M2U' M2	V  R'UR'U' yx2 R'UR'U' R 1 U'R'URU
E  x UR'U'LURU'r'2 U'RULU'R'U	A:b  x' RU'RD2 R'URD2 R'2	A:a  x' L'UL'D2 LU'L'D2 L2	T  RUR'U'R'F R2U'R'U' RUR'F'	Y  F RU'R'U' RUR'F' RUR'U' R'FRF'
F  U'R'URU'R'2 F'U'FUR F x R'U' R 1	R:b  R'U2 RU'2 R'F RUR'U' R'F'R2U'	R:a  LU'2 L'U2 LF' L'U'LU LFL'2U	J:b  RUR'F' RUR'U' R'FR2U'R'U'	J:a  L'U'LF L'U'LU LFL'2 ULU
G:d  LdF' L'2u' LU'L'UL'u L2	G:c  L'2u' LU'LUL'u L2 z' FL'F'	G:b  R'd'F R2u R'URU'Ru' R'2	G:a  R2u R'UR'U'Ru' R'2 z F'RF	注： 利用对称，一个公式就可变为两个。这里，加空格、括号和分成多行是为了便于记忆。
N:b  R'URU' R'F'U'F RUR'F R'F'RUR	N:a  LU'L'U LFUF' L'U'LF' LFL'UL'			