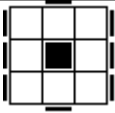
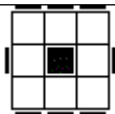
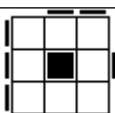
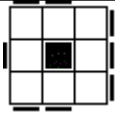
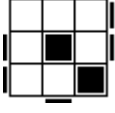
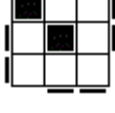
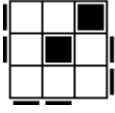
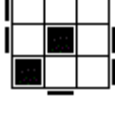
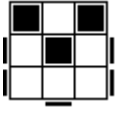
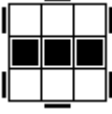
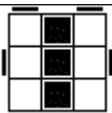
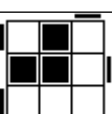
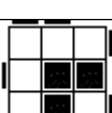
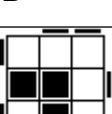
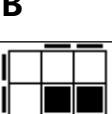


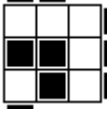
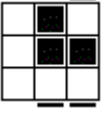
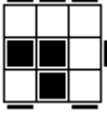
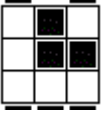
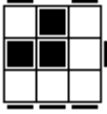
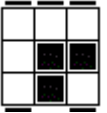
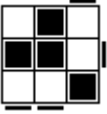
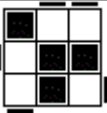
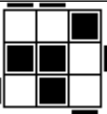
OLL双向手法教程《一箭双雕》

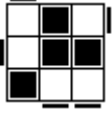
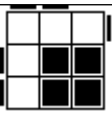
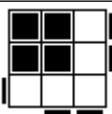
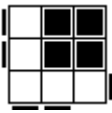
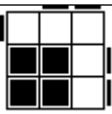
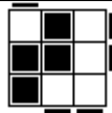
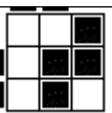
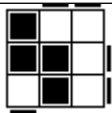
作者：HZCA-NaCl(陈霖) 2010.5.23

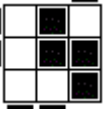
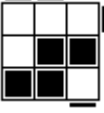
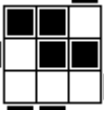
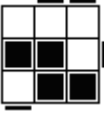
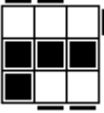
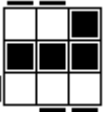
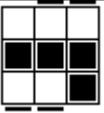
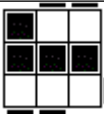
CASE	公式	手法记忆要点	时间
 1A	$(R\ U'U')(R2'\ F\ R\ F')\ U2(R'\ F\ R\ F')$	将 R2'拆成 2 个 R'，则 后半部分为 2 个(R' F R F')中间夹 U2	1.6
 1B	$U'\ (R\ U)\ B'\ (l\ U\ l'\ R')\ U'\ (l'\ U\ R\ U')$	用小写 l 与 R 的动作可以使 F 类动作变为 U， 左手抓魔方，转 l 方便	1.6
 2A	$F\ (R\ U\ R'\ U')\ F'\ f\ (R\ U\ R'\ U')\ f'$	RUR'U'记忆方便	1.6
 2B	$f\ (U\ R\ U'\ R')\ f'\ F\ (U\ R\ U'\ R')\ F'$	2A 的动作倒回去	1.6
 3A	$f\ (R\ U\ R'\ U')\ f'\ U'\ F\ (R\ U\ R'\ U')\ F'$	RUR'U'与 Ff 记忆	1.7
 3B	$F\ (U\ R\ U'\ R')\ F'\ U'\ F\ (R\ U\ R'\ U')\ F'$	中间部分 3B 是 U，4B 是 U'，其他一模一样	1.8
 4A	$f\ (R\ U\ R'\ U')\ y\ x\ R'\ F\ (R\ U\ R'\ U')\ F'$	UR'U'与 Ff 记忆	1.7
 4B	$F\ (U\ R\ U'\ R')\ F'\ U'\ F\ (R\ U\ R'\ U')\ F'$	中间部分 4B 是 U'，3B 是 U，其他一模一样	1.8
 5A	$(r'\ R\ U)\ (R\ U\ R'\ U')(r\ R'\ l'\ U\ R\ U')$	公式做起来的感觉很像 OLL 中的 5 点	1.5

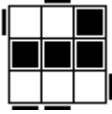
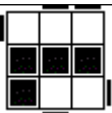
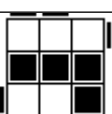
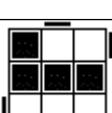
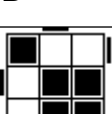
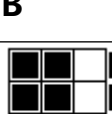
5B	$F (U R U' R^2 F') U' F (U R U') F'$	公式 7B 倒回去	1.8
6A	$F (R U R') (U y') (R' U^2) (R' F R F')$	张砷镓的公式	1.8
6B	$(FR'F')(RU'U')(FR'F')(RU'RU'R')$	公式 7A 倒回去	1.8
7A	$(R U R' U)(R' F R F') U^2 (R' F R F')$	公式 6B 互为逆算法	1.6
7B	$F (U R' U' F') U (F R^2) (U R' U') F'$	公式 5B 倒回去	1.7
8A	$r'(R U)(R U R'U' r^2)(R^2'U) (R U') r'$	公式做起来的感觉很像 5A	1.5
9A	$(RU'U')(R^2U')(RU')(R' U^2)(FRF')$	RU'动作为主的手法	1.6
9B	$R' F (U R U' R^2 F' R^2) (U R' U' R)$	也是不错的公式,F'做完 R'2 就用右手拇指上推	1.4
10A	$f (R U R' U') * 2 f'$	f 之后 2 下 RUR'U',非常顺手	1.1
10B	$F(U R U' R') * 2 F'$	也是顺手好记忆的公式	1.1
11A	$(R' U' R U')R' d(R' U^1 U)$	RU 为主,1 顺手一带,舍去原来的 B	1.1
11	$(L' U' r' F r U')y' RU'R' F'$	公式 11A 镜像的变形	1.2

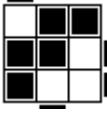
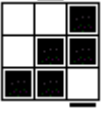
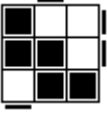
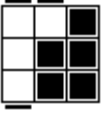
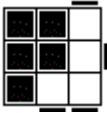
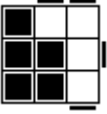
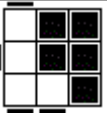
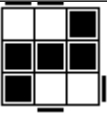
B			
 A	$F (R U R' U') (R F') (r U R' U') r'$	gan 的公式	1.5
 B	$f (R U R' U') f' F (R U R' U')^2 F'$	RUR'U' 为主的公式很顺手，而且好记	1.5
 A	$F (R U R' U')^2 F'$	上一个公式的后面	1.0
 B	$f (U R U' R')^2 f'$	公式 10A 倒回去	1.1
 A	$B' (R' U' R U)^2 B$	(R'U'RU) 手法和 B 手法	1.1
 B	$R' U' l' (U R U' R' U R U') x' R U$	中间 UR 部分是基本手法	1.2
 A	$(r' U) (r^2 U') (r^2 U' r^2) U r'$	其实就是 r' 来下再 U , 然后右手动作和顶层动作	1.4
 B	$(R' U R U' R'^2 F R^2) (U R' U' F' R)$	9B 逆算法	1.3

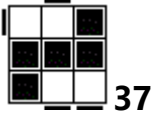
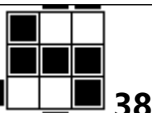
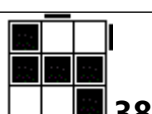
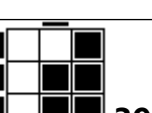
 A	$(l\ U')\ (l'2\ U)\ (l2\ U\ l'2)\ U'\ l$	15A 的镜像公式	1.5
 B	$r\ U'\ r'2U\ r2U\ r'2\ U'r$	16A 的换向变形	1.5
 A	$(r'\ U2)\ (R\ U\ R'\ U')\ (R\ U\ R'\ U)\ r$	RUR' U' 记忆好	1.5
 B	$(l'\ U2)\ (L\ U\ L'\ U')\ (L\ U\ L')\ U\ R$	18A 的反向	1.7
 A	$(r\ U'U')\ (R'\ U')\ (R\ U\ R'\ U')\ (R\ U'\ r')$	Gan 的公式	1.5
 B	$x'\ (R\ U'U')\ (L'\ U'\ L\ U)\ (L'\ U'\ L)\ U'\ R'$	17A 镜像手法变形	1.7
 A	$(R'\ U'\ R)\ y'\ x'\ (R\ U')(R'F)(R\ U\ R')$	Gan 的公式	1.4
 B	$(L'U'LU')(r'\ U'\ r\ F)(L'U2L)$	20A 镜像手法的变形	1.5
	$(R\ UR'U)(R'FR\ F')(RU'U'R')$	与 7A 很像!	1.5

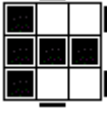
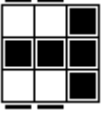
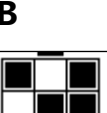
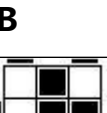
A			
 20	$(LUL' y x') (L'U r U' r' U r) F$	19A 镜像公式手法变形	1.6
B			
 21	$(r' U2)(R U R'U)r$	很简单， 23A 倒回去	1.0
A			
 21	$(l' U2)(L U L' U l)$	22A 镜像手法	1.0
B			
 22	$(r U'U') (R' U' R U' r')$	21B 镜像手法	1.0
A			
 22	$x'(R U'U') (L' U' L U' l')$	21A 镜像变形手法	1.1
B			
 23	$(r U R' U) (R U'U' r)$	22A 倒回去	1.0
A			
 23	$(l U L' U) (L U'U' l')$	22B 逆向手法的变形	1.1
B			
 24	$(r' U' R U') (R' U2 r)$	21A 倒回去	1.1
A			

 24 B	$(R' F') (r U') (L' U^2 L)$	手法的变形	1.2
 25 A	$r' (R^2 U R' U) (R U' U' R' U R')$	RU 为主的手法	1.4
 25 B	$(r U R') (U R' F R F') (R U' U' r')$	/	1.5
 26 A	$(r R'^2 U' R U')(R' U^2 R U' R)r'$	25A 镜像手法	1.5
 26 B	$(r' R)(L' U' L U')(L' U^2 L U')r R'$	25A 镜像手法	1.5
 27 A	$(r U' r' U')(r U r') (F' U F)$	28B 镜像换向	1.3
 27 B	$f (R U R^2 U' R' U R U') f$	小 f 的动作和 RU 结合， 很顺手的公式	1.3
 28 A	$(R' F R U R' F' R) (R U' R')$	R'F 再 RUR'F 然后转 y'	1.3
 28	$(r' U) (r U r' U' r)y(R U' R')$	27A 镜像变向换向手法	1.3

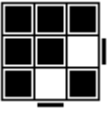
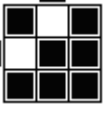
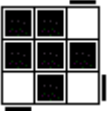
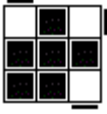
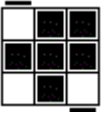
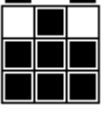
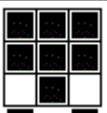
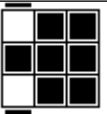
B			
 A	$(r\ U\ r')\ (R\ U\ R'\ U')\ (r\ U'\ r')$	中间 RUR' U' 基本手法，前后各一组动作	1.1
 B	$(R\ B\ R')\ (L\ U\ L'\ U')\ (R\ B'\ R')$	30A 镜像变向换向手法	1.3
 A	$(r'\ U'\ r)\ (R'\ U'\ R\ U)\ (r'\ U\ r)$	这个很像 29A!	1.1
 B	$(R'\ F'\ R)\ (L'\ U'\ L\ U)\ (R'\ F\ R)$	29A 镜像变向换向手法	1.3
 A	$(R\ U'U')\ (R'\ 1'\ U\ R\ U'\ 1')(U'U'\ R')$	原公式的变形，中间也可以是 (R'2 F R F'R)	1.4
 B	$(L\ U'U')\ (L'\ r'\ U)\ (L\ U'\ r\ U'U'\ r')$	31A 的换向手法变形	1.4
 A	$F(RU'R'U'RUR')F'$	可改 FRU'R'U'R U I'U'	1.0
 B	$x\ (U\ r\ U')\ (r'\ F')\ (r\ U\ r'\ U')$	路径和上一个一样，换向的手法变形	1.1

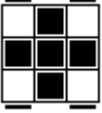
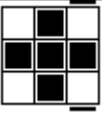
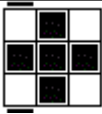
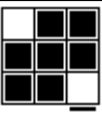
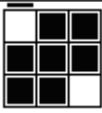
 A	$(R\ U\ R'\ U)\ (R\ U'\ R'\ U')\ (R'\ F\ R\ F')$	3 个基本手法的结合	1.3
 B	$(L\ U\ L'\ U)\ (L\ U'\ L'\ U')\ (r'\ U\ L\ U')$	34A 的镜像变形	1.4
 A	$(R'\ U'\ R\ U'\ R'\ U)\ (R\ U\ U'\ R'\ U)$	33B 的镜像	1.3
 B	$(L'\ U')\ (L\ U'\ r'\ F\ r\ U\ r\ U'\ r'\ F)$	33A 的镜像	1.4
 A	$(R\ U)\ f'\ (L'U'LU\ f)R'$	/	1.3
 B	$r\ f\ R'\ f'\ r'\ U\ r\ U\ r'$	37A 倒回去变形手法	1.5
 A	$L'U'\ f\ (R\ U\ R'\ U')fL$	也是顺手好记的公式	1.3
 B	$R'\ U'\ F\ (U\ R\ U')\ (R'\ F'\ R)$	张砷镓的公式	1.4
	$(r\ U'\ r'\ U'\ r)x(u\ R\ u'\ r')$	35B 逆算公式变形	1.3

A			
 37	$R\ f\ (U'L'UL)(f\ U'\ R')$	35A 倒回去	1.4
B			
 38	$(R'\ F\ R\ U\ R'\ U'\ F')\ U\ R$	与 36B 互为逆算法	1.3
A			
 38	$(r'\ U)\ (r\ U\ r'\ F'\ U'\ F)\ r$	36A 倒回去	1.3
B			
 39	$f\ (R\ U\ R'\ U')\ f$	实在太好记了，记不住 就该去测测你的 IQ 了！	0.6
A			
 39	$F\ (U\ R\ U'\ R')'\ F'$	41A 倒回去	0.7
B			
 40	$B'\ (U'\ R'\ U\ R\ B)$	入门公式之 1	0.7
A			
 40	$F'\ (U'\ r'\ F\ r)\ F$	39B 镜像的变形	0.8
B			
 41	$F\ (R\ U\ R'\ U')\ F'$	RUR' U' 手法	0.6
A			

 B	$f(U R U' R') f$	39A 倒回去	0.7
 A	$(R U R' U') (l' U R U')$	RUR'U'R'FRF' 的变形	0.7
 B	$L' U' L U) (r U' r' F)$	42A 镜像变形	0.7
 A	$(r U R' U')(R r' L' U R U')(L R')$	L 用左手带下即可	1.5
 B	$U' (R' F R F') (R U'U' R' U') (F' U' F)$	基本手法组合的公式， 并不难记，注意括号	1.4
 A	$f(R U) (R^2 U' R' U) (R^2 U' R') f$	头尾 f 中间 RU 和 R2	1.5
 B	$F U (R U'U' R' U')*2 F'$	头尾 F 中间括号动 2 次	1.5
 A	$(R' U R U'U' R' U' F' U) F (U R)$	放慢些，观察公式后面 步骤时的魔方形态	1.5
 	$(R' U' R U' R' U^2 R) F (R U R' U') F'$	其实就是 2 个 case 结	1.4

B		和看似很长的样子	
 46 A	$(LU\ r'\ F)(r\ U'U')\ L'\ f(U\ RU'\ R')\ f'$	46B 前半部分的镜像加上后面的基本手法	1.5
 46 B	$(RUR'U)(R\ U'U')\ (R'\ F)(R\ U\ R'\ U')\ F'$	还是 2 个 case 结和	1.5
 47 A	$(R'\ U')\ (R'\ F\ R\ F')\ U\ R$	/	1.1
 47 B	$LU(r\ U'\ r')(F\ U'L')$	47A 镜像手法变形	1.2
 48 A	$(R'\ U'\ R\ U)\ y\ (r\ U\ R'\ U')R\ r'$	RUR'U' 反了下，第二个变成了双层转	1.3
 48 B	$(R\ U)\ (R^2\ U')\ (R'\ F\ R\ U\ R'\ U')\ F'$	张砷镓的公式，后半部分注意右手拇指的手法	1.4
 49 A	$(R\ U\ R'\ U'\ r)(R'\ U)(R\ U'\ r')$	中间部分公式和转 M 类似，比较顺手的手法	1.0
 49 B	$(RUR'U')(r'\ R)(URU'R'U')(r\ R')$	中间部分公式转 M 类似，比较顺手的手法	1.1

 A	$(r\ U\ R'\ U')\ (r'\ R\ U\ R\ U'\ R')$	49A 互为逆算法	1.1
 B	$(l\ U\ L'\ U')\ (r\ R'\ U)\ (L\ U'\ L')$	50A 换向法变形	1.3
 A	$(R'\ U\ R\ U')(R'\ U^2\ R)$	入门公式	0.7
 B	$(L'\ U'\ L\ U')r'\ F^2\ r$	52A 镜像的变形手法	0.8
 A	$(RUR'U)(RU'U'R')$	入门公式	0.7
 B	$(LU\ r'\ F)(r\ U'U')\ L'$	51A 镜像的手法变形	0.8
 A	$F\ (R\ U'\ R'\ U)\ (R\ U\ R'\ U)\ (R\ U'\ R'\ F')$		1.3
 B	$(RUR'U)(RU'U')(R^2U'RU')(R'U^2R)$	RU 为主的手法	1.3
	$(r\ U\ R'\ U')\ (r'\ F\ R\ F')$	很 像 公 式 $RUR'U'R'FRF'$	0.8

A			
 54	$(R' F') (r U R U') (r' F)$	54A 镜像变形	0.9
B			
 55	$(R U'U' R' U') (R U R' U' R U' R')$	55B 倒回去	1.1
A			
 55	$(R U R' U)(R U' R' U)(R U'U'R')$	55A 倒回去	1.1
B			
 56	$(R U'U') (R'^2 U') (R^2 U' R'^2) U^2 R$	Gan 的公式	1.4
A			
 56	$F (U R U'R') F' f(U R U'R')f'$	公式 39B +公式 41B	1.5
B			
 57	$F' (r U R' U') (r' F R)$	公式 $rUR'U'r'FRF'$ 的 F 从最后面移到最前面	0.9
A			
 57	$x' (U' R U) (L' U') (R' U r)$	反向手法变形	1.1
B			

OLL 双向记忆学习指引：

背完 51A-57A 时，可以考虑学习 51B-57B 的公式

OLL 学习完时学习 $F(RUR'U)F'$ 等基本手法为主的公式

然后学习常见的情况以及一些简单的情况如“21A-24B”等
之后学习一些相对较长的镜像公式和手法组合公式

杭州-NaCl 陈霖

新修正

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