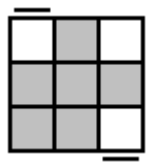


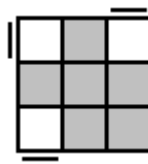
This subgroup, OCLL (also OLL-C) is used in methods which have oriented the [LL](#) edges earlier in the solve, such as [ZZ](#). Solving the OCLL is also the second part of the [2-look OLL](#).

OLL 27



Name: S, Sune
Used in: [OCLL](#), OLL
Optimal moves: 7 [HTM](#)

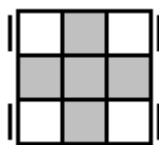
OLL 26



Name: -S, Antisune
Used in: [OCLL](#), OLL
Optimal moves: 7 [HTM](#)

	OLL	R U R' U R U2 R'	 [1]
	OLL	y2 R' U' R U' R' U2 R	 [X]
	OLL	y' R' U2 R U R' U R	 [X]
	OLL	y' R U2 R' U' R U' R'	 [X]
	OLL	y L' U2 L U L' U L	 [X]
	OLL	y' L U2 L' U' L U' L'	 [X]
	OLL	y2 L U L' U L U2 L'	 [X]
	OLL	L' U' L U' L' U2 L	 [X]
	OLL	R U' L' U R' U' L	 [X]
	OLL	L' U R U' L U R'	 [X]
	OLL	U2 r2 U R' U' L' U R U' r' (x')	 [X]
	OLL	y' L' U R U' L U R'	 [X]

OLL 21



Name: H, Double Sune
Used in: [OCLL](#), OLL
Optimal moves: 11 [HTM](#), 10 [STM](#)

	OLL	R U R' U R U' R' U R U2 R'	 [X]
---	-----	--	---

	OLL	<u>y R U2 R' U' R U R' U' R U' R'</u>	 X]
---	-----	---------------------------------------	---

	OLL	<u>y F (R U R' U') (R U R' U') (R U R' U') F'</u>	 X]
---	-----	---	---

	OLL	<u>y F' (L' U' L U) (L' U' L U) (L' U' L U) F</u>	 X]
---	-----	---	---

	OLL	<u>R' U' R U' R' U R U' R' U2 R</u>	 X]
---	-----	-------------------------------------	---

	OLL	<u>L U L' U L U' L' U L U2 L'</u>	 X]
---	-----	-----------------------------------	---

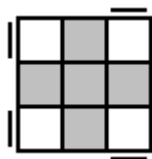
	OLL	<u>y L' U2 L U L' U' L U L' U L</u>	 X]
---	-----	-------------------------------------	---

	OLL	<u>y (R' U R U) (R' U R U') (R' U R U') R' U' R U2 R' U R</u>	 X]
---	-----	---	---

	OLL	<u>L' U2 M' (y) R U2 R U2 R' U2 (y')1</u>	 X]
---	-----	---	---

	OLL	<u>y F (R U R' U')(R U R' U')(R U R' U') F'</u>	 X]
---	-----	---	---

OLL 22



Name: pi, Bruno, wheel

Used in: [OCLL](#), OLL

Optimal moves: 9 [HTM](#)

	OLL	<u>R U2 R2' U' R2 U' R2' U2 R</u>	 X]
---	-----	-----------------------------------	---

	OLL	<u>f (R U R' U') f F (R U R' U')</u> <u>F'</u>	 X]
---	-----	---	---

	OLL	<u>y2 f (L' U' L U) f F' (L' U' L</u> <u>U) F</u>	 X]
---	-----	--	---

	OLL	<u>y2 L' U2 L2 U L2 U L2 U2</u> <u>L'</u>	 X]
---	-----	--	---

	OLL	<u>R U2 R2 U' R' U R U' R U'</u> <u>R' y M' U2 M</u>	 X]
---	-----	---	---

	OLL	<u>R' U L U' R U' L' U' L U' L'</u>	 X]
---	-----	-------------------------------------	---

	OLL	<u>y2 L U' R' U L' U R U R' U</u> <u>R</u>	 X]
---	-----	---	---

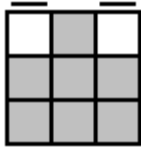
	OLL	<u>y2 L' U R U' L U' R' U' R U'</u> <u>R'</u>	 X]
---	-----	--	---

	OLL	<u>R U' L' U R' U L U L' U L</u>	 X]
---	-----	----------------------------------	---

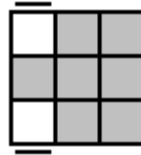
	OLL	<u>R U R' U R U2 R' y' R U R'</u> <u>U R U2 R'</u>	 X]
---	-----	---	---

OLL 23

OLL 24



Name: U, [Headlights](#),
 Superman
 Used in: [OCLL](#), OLL
 Optimal moves: 9 [HTM](#)



Name: T, chameleon, shark
 Used in: [OCLL](#), OLL
 Optimal moves: 8 [HTM](#)

	OLL	R2 D' R U2 R' D R U2 R			OLL	r U R' U' L' U R U' x'	
		X]				X]	
	OLL	L2 D L' U2 L D' L' U2 L'			OLL	r U R' U' r' F R F'	
		X]				X]	
	OLL	R' U2 R F U' R' U' R U F'			OLL	y' F R U R' U' R U' R' U' R U R' F'	
		X]				X]	
	OLL	l2 U' R D2 R' U R D2 R			OLL	R U R2' U' R2 U' R2' U2' R U' R U' R'	
		X]				X]	
	OLL	l2' U' z' U R2 U' L U R2 z' L			OLL	y' R U' R' (U2 R U R') (U2 R U R') (U R U' R')	
		X]				X]	
	OLL	y' R U R' U' (R U' R' U2)(R U' R' U2) R U R'			OLL	y x D' R' U R D R' U' R x'	
		X]				X]	
	OLL	y2 R' F2 R U2 R U2 R' F2 R U2 R'			OLL	y x D L U' L' D' L U L' x'	
		X]				X]	
	OLL	y2 R2 D R' U2 R D' R' U2 R'			OLL	y x' U' R' D R U R' D' R x	
		X]				X]	
	OLL	(R' U' R U) R' U2 R2 U (R' U R U2 R)			OLL	y2 R' F' r U R U' r' F	
		X]				X]	

	OLL	R2' B2 R F2' R' B2 R F2' R	 X]
---	-----	--	---

	OLL	y2 l' U' L U R U' r' F	 X]
---	-----	--	---

	OLL	U2 R2' D R' U2 R D' R' U2 R'	 X]
---	-----	--	---

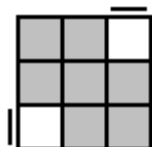
	OLL	y' l U l' F R B' R' F'	 X]
---	-----	--	---

	OLL	R d' R' U R d R' (y) R' U2 R	 X]
---	-----	--	---

	OLL	R' U L' U R U' L U2 R' U R	 X]
---	-----	--	---

	OLL	(x) R' B2' (R U' R' U) B2' (U' R U)	 X]
---	-----	---	---

OLL 25



Name: L, Bowtie, Triple-Sune

Used in: [OCLL](#), OLL

Optimal moves: 8 [HTM](#)

	OLL	y2 R' F R B' R' F' R B	 X]
---	-----	--	---

	OLL	y' F' r U R' U' r' F R	 X]
---	-----	--	---

	OLL	y' x U R' U' L U R U' r'	 X]
---	-----	--	---

	OLL	R' F' L' F R F' L F	 X]
---	-----	-------------------------------------	---

	OLL	<u>y R' U' (R U R' F') (R U R' U') (R' F R2)</u>	 X]
---	-----	--	---

	OLL	<u>y2 R U2' R D R' U2 R D' R2'</u>	 X]
---	-----	------------------------------------	---

	OLL	<u>y2 F R' F' r U R U' r'</u>	 X]
---	-----	-------------------------------	---

	OLL	<u>y2 l' U R D' R' U' R D x'</u>	 X]
---	-----	----------------------------------	---

	OLL	<u>y2 x' L' U' R' U L U' R U</u>	 X]
---	-----	----------------------------------	---

	OLL	<u>x' D R U R' D' R U' l'</u>	 X]
---	-----	-------------------------------	---

	OLL	<u>x' U L' U' R U L U' l'</u>	 X]
---	-----	-------------------------------	---

	OLL	<u>x' R' D R U' R' D' R U x</u>	 X]
---	-----	---------------------------------	---

	OLL	<u>x R' U R D' R' U' R D x'</u>	 X]
---	-----	---------------------------------	---

	OLL	<u>y2 x L U' L' D L U L' D' x'</u>	 X]
---	-----	------------------------------------	---

	OLL	<u>l' U' L' U R U' L U x'</u>	
---	-----	-------------------------------	---

			X]
--	--	--	----

	OLL	<u>U_r U R U' L' U R' U' x'</u>	 X]
---	-----	---	---

	OLL	<u>R U² R' U' R U R' U' R U R'</u> <u>U' R U' R'</u>	 X]
---	-----	--	---

	OLL	<u>R U R' U R U' R' U R U' R'</u> <u>U R U² R'</u>	 X]
---	-----	--	---

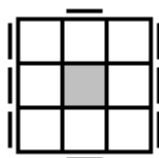
	OLL	<u>y² L' R U R' U' L U R U' R'</u>	 X]
---	-----	---	---

	OLL	<u>F R B R' F' l U' l'</u>	 X]
---	-----	----------------------------	--

	OLL	<u>U R U² R' L' U' L U' R U' R'</u> <u>L' U² L</u>	 X]
---	-----	---	---

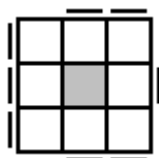
No edges flipped correctly

OLL 1



Name: runway
Used in: OLL
Optimal moves: 11 [HTM](#)

OLL 2



Name: zamboni
Used in: OLL
Optimal moves: 11 [HTM](#)

	OLL	<u>(R U²) (R²' F R F' U²') (R' F</u> <u>R F')</u>	 ^[2] 1
---	-----	---	---

	OLL	<u>F (R U R' U') F' f (R U R' U')</u> <u>f</u>	 ^[3] 1
---	-----	---	---

	OLL	<u>R U B' R B R² U' R' F R F'</u>	 X]
---	-----	--	---

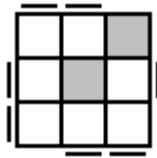
	OLL	<u>y² F' (L' U' L U) F f' (L' U' L</u> <u>U) f</u>	 X]
---	-----	--	---

	OLL	<u>y r U r' U2 r U2 R' U2 R U' r'</u>	 [X]
---	-----	---------------------------------------	---

	OLL	<u>y l' U' l U2 l' U2 L U2 L' U l</u>	 [X]
---	-----	---------------------------------------	---

	OLL	<u>y2 F R' F' R U R2 B' R' B U' R'</u>	 [X]
---	-----	--	---

OLL 3

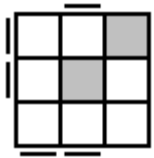


Name:

Used in: OLL

Optimal moves: 11 [HTM](#)

OLL 4



Name:

Used in: OLL

Optimal moves: 11 [HTM](#)

	OLL	<u>y f (R U R' U') f U' F (R U R' U') F'</u>	 [X]
---	-----	--	--

	OLL	<u>f (R U R' U') f U F (R U R' U') F'</u>	 [X]
---	-----	---	--

	OLL	<u>y2 r' R2 U R' U r U2 r' U R' r</u>	 [4] l
---	-----	---------------------------------------	--

	OLL	<u>R' U2 x R' U R U' y R' U' R' U R' F</u>	 [X]
---	-----	--	---

	OLL	<u>y2 M U l' U2 l U L' U L M'</u>	 [X]
---	-----	-----------------------------------	---

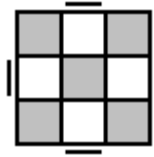
	OLL	<u>y r' R U' r U2 r' U' R U' R2' r</u>	 [X]
---	-----	--	---

	OLL	<u>y M U' r U2' r' U' R U' R' M'</u>	 [X]
---	-----	--------------------------------------	---

	OLL	<u>l L2 U' L U' l' U2 l U' M'</u>	 [X]
---	-----	-----------------------------------	---

OLL 20

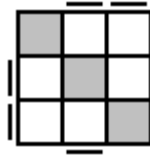
OLL 17



Name: X

Used in: OLL

Optimal moves: 11 [HTM](#)



Name: slash, diagonal

Used in: OLL

Optimal moves: 11 [HTM](#)

	OLL	r' R U R U R' U' r2 R2' U R U' r'	
--	-----	---	--

	OLL	M U R U R' U' M2 U R U' r'	
--	-----	--	--

	OLL	r U R' U' M2 (U R U' R') U' M'	
--	-----	--	--

	OLL	(x) U R' U' M2 U R U' M' (x') U' M'	
--	-----	---	--

	OLL	M' U2 M' U2 M' U M U2 M U2 M	
--	-----	--	--

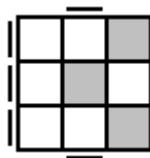
	OLL	M' U2 M U2 M' U M U2 M' U2 M	
--	-----	--	--

	OLL	M U2 M' U2 M U M' U2 M U2 M' U'	
--	-----	---	--

	OLL	M d r2 U M' U2 M U r2 S'	
--	-----	--	--

	OLL	M U M F R' F' M2 F R F' U'	
--	-----	--	--

OLL 18



Name:

Used in: OLL

Optimal moves: 11 [HTM](#)

	OLL	y' r U R' U R U2 r2' U' R U' R' U2 r	
--	-----	--	--

	OLL	y F R U R' d R' U2 R' F R F'	
--	-----	--	--

	OLL	<u>R2 U2 R' F2 U2 R2 F' R2</u> <u>U2 F2 R U2 R2 U'</u>	 [X]
---	-----	---	---

	OLL	<u>R U2 R2 F R F' U2 M' U R</u> <u>U' r'</u>	 [X]
---	-----	---	---

	OLL	<u>R B U B' R' F2 B D' L' D B'</u> <u>F2</u>	 [X]
---	-----	---	---

	OLL	<u>l' U' r' U2 L U2 L' U2 r U l</u>	 [X]
---	-----	-------------------------------------	---

	OLL	<u>L' R' F' U2 L2 U2 L2 U2 L2</u> <u>F L R</u>	 [X]
---	-----	---	---

	OLL	<u>y2 (R' F R F') U2 (R' F R F')</u> <u>(U F U F)</u>	 [X]
---	-----	--	---

	OLL	<u>F2 M F2 M2 U' M2 F2 M'</u> <u>F2 U</u>	 [X]
---	-----	--	---

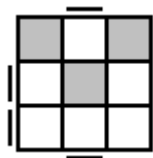
	OLL	<u>y (F R' F' R) U2 (F R' F' R)</u> <u>(U' R U' R')</u>	 [X]
---	-----	--	---

	OLL	<u>F2 M F2 U' M2 U B2 M B2</u>	 [X]
---	-----	--------------------------------	---

	OLL	<u>y x (U R' U' R) B2 (U R' U'</u> <u>R)(B' R B' R') x'</u>	 [X]
--	-----	--	---

	OLL	<u>F' B' R E S R S' R2 E' F B</u>	 [X]
---	-----	-----------------------------------	---

OLL 19



Name:

Used in: OLL

Optimal moves: 11 [HTM](#)

	OLL	<u>S' U' S2 U R' U' R' S' R U R</u>	 [X]
---	-----	-------------------------------------	---

	OLL	<u>r' U2 R U R' U r2 U2' R' U' R</u> <u>U' r'</u>	 [X]
---	-----	--	---

	OLL	<u>(M U) 4 (M' U) 4</u>	 [X]
---	-----	-------------------------	---

	OLL	<u>R' U2 F R U R' U' y' R2 U2</u> <u>R B</u>	 [X]
---	-----	---	---

	OLL	<u>(M' U)3 M' U' (M' U)3 M'</u>	 [X]
---	-----	---------------------------------	---

	OLL	<u>r' R U R U R' U' r R2' F R F'</u>	 [X]
---	-----	--------------------------------------	---

	OLL	<u>M U R U R' U' M' R' F R F'</u>	 [X]
---	-----	-----------------------------------	---

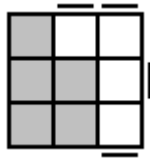
	OLL	<u>M U R U R' U' r R2' F R F'</u>	 [X]
---	-----	-----------------------------------	---

	OLL	<u>M U R U R' U' M' l' U R U'</u>	 [X]
---	-----	-----------------------------------	---

	OLL	<u>y2 M' U' R' U' R U r' R2 B' R' B</u>	 [X]
---	-----	---	---

"P" shapes

OLL 31

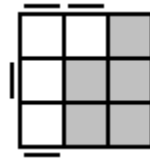


Name:

Used in: OLL

Optimal moves: 9 [HTM](#)

OLL 32



Name:

Used in: OLL

Optimal moves: 9 [HTM](#)

	OLL	<u>y (F R' F' R) (U R U R') (U' R U' R')</u>	 [X]
---	-----	--	---

	OLL	<u>L' d' R d L U' L' B' L</u>	 [X]
---	-----	-------------------------------	---

	OLL	<u>S' L' U' L U L F' L' f</u>	 [X]
---	-----	-------------------------------	---

	OLL	<u>y x U R' U' l U R U R' U' R U' R'</u>	 [X]
---	-----	--	---

	OLL	<u>y2 R' U' F U R U' R' F' R</u>	 [X]
---	-----	----------------------------------	---

	OLL	<u>L' U' B U L U' L' B' L</u>	 [X]
---	-----	-------------------------------	---

	OLL	<u>R U x' U' F' R' F R U R'</u>	 [X]
---	-----	---------------------------------	---

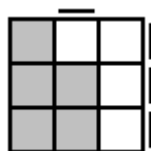
	OLL	<u>R d L' d' R' U R B R'</u>	 [X]
---	-----	------------------------------	---

	OLL	<u>S R U R' U' R' F R f</u>	 [X]
---	-----	-----------------------------	---

			X]				X]
--	--	--	----	--	--	--	----

	OLL	<u>y x' U' R U' U' R' U' R U' R'</u> <u>U R</u>		[	X]
---	-----	--	---	---	----

OLL 43

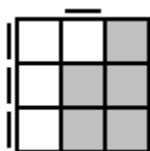


Name:

Used in: OLL

Optimal moves: 6 [HTM](#)

OLL 44



Name:

Used in: OLL

Optimal moves: 6 [HTM](#)

	OLL	<u>y R' U' F' U F R</u>		[	X]
---	-----	---	---	---	----

	OLL	<u>f L' U' L U f</u>		[	X]
---	-----	--------------------------------------	---	---	----

	OLL	<u>B' U' R' U R B</u>		[	X]
---	-----	---------------------------------------	---	---	----

	OLL	<u>y2 F' U' L' U L F</u>		[	X]
---	-----	--	---	---	----

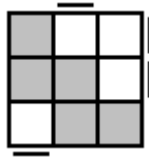
	OLL	<u>y2 U R U R' F' L' U' L F</u>		[	X]
---	-----	---	---	---	----

	OLL	<u>y2 R' U' F R' F' R U R</u>		[	X]
---	-----	---	---	---	----

	OLL	<u>y' (R U l') U' (r' U' r) U x'</u>		[	X]
---	-----	--	---	---	----

"W" shapes

OLL 36

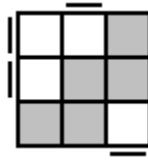


Name: sea-mew

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 38



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	R' U' R U' R' U R U R y R' F' R	 X]
---	-----	--	---

	OLL	L U L' U L U' L' U' L' B L B'	 X]
---	-----	---	---

	OLL	R' U' R U' R' U R U R B' R' B	 X]
---	-----	--	---

	OLL	y2 R U R' U R U' R' U' R' F R F'	 X]
---	-----	---	---

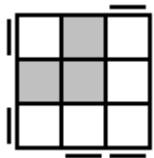
	OLL	y2 (L' U' L U') (L' U L U) (L F' L' F)	 X]
---	-----	---	---

	OLL	(L' U' L U) y' (R U2 R' U') y (L' U' L)	 X]
---	-----	--	---

	OLL	(R U R' U') y (L' U2' L U) y' (R U R')	 X]
---	-----	---	--

"L" shapes

OLL 48

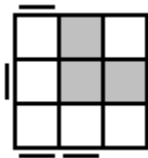


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 47



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	F R U R' U' R U R' U' F'	 X]
---	-----	--	---

	OLL	F' L' U' L U L' U' L U F	 X]
---	-----	--	---

	OLL	y2 f U R U' R' U R U' R' f	 X]
---	-----	--	---

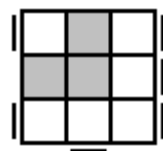
	OLL	y' r U R' U R U2 r' R' U2 R U R' U R	 X]
---	-----	---	---

	OLL	y r U2 R' U' R U' r' R' U' R U' R' U2 R	 X]
---	-----	--	---

	OLL	R' U' x (R' U R U')*2 x' U R	 X]
---	-----	--	---

	OLL	<u>y' r' U' R U' R' U2 r R U2 R'</u> <u>U' R U' R'</u>	 [X]
---	-----	---	---

OLL 53

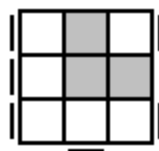


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 54



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	<u>l' U' L U' L' U L U' L' U2 l</u>	 [X]
---	-----	-------------------------------------	---

	OLL	<u>r U R' U R U' R' U R U2 r'</u>	 [X]
---	-----	-----------------------------------	---

	OLL	<u>y' l U2 L U L' U' L U L' U' l'</u>	 [X]
---	-----	---------------------------------------	---

	OLL	<u>y' r U2 R' U' R U R' U' R U'</u> <u>r'</u>	 [X]
---	-----	--	---

	OLL	<u>y2 r' U' R U' R' U R U' R' U2</u> <u>r</u>	 [X]
---	-----	--	--

	OLL	<u>y2 l U L' U L U' L' U L U2 l'</u>	 [X]
---	-----	--------------------------------------	--

	OLL	<u>y' r' U2 R U R' U' R U R' U r</u>	 [X]
---	-----	--------------------------------------	---

	OLL	<u>y l' U2 L U L' U' L U L' U' l</u>	 [X]
---	-----	--------------------------------------	---

	OLL	<u>y' r U2 R' U' R U' r' R U2 R'</u> <u>U' R U' R'</u>	 [X]
---	-----	---	---

	OLL	<u>y2 r' U' R U' R' U2 r R' U' R</u> <u>U' R' U2 R</u>	 [X]
---	-----	---	---

	OLL	<u>r U R' U R U2 r' R U R' U R</u> <u>U2 R'</u>	 [X]
---	-----	--	---

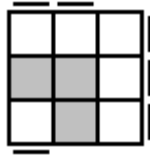
	OLL	<u>y r' U2 R U R' U r R' U2 R U</u> <u>R' U R</u>	 [X]
---	-----	--	---

	OLL	<u>F R U R' U' F' R U R' U' R' F</u> <u>R F'</u>	 [X]
---	-----	---	---

	OLL	<u>y f (R U R' U') (R U R' U') f</u> <u>F (R U R' U') F'</u>	 [X]
---	-----	---	---

OLL 49

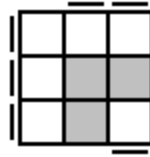
OLL 50



Name:

Used in: OLL

Optimal moves: 9 [HTM](#)



Name:

Used in: OLL

Optimal moves: 9 [HTM](#)

	OLL	R B' R2 F R2 B R2 F' R	 X]
	OLL	y2 R' F R2 B' R2 F' R2 B R'	 X]

	OLL	1 U' l2' U l2 U l2' U' 1	 X]
	OLL	y2 x' R' D R2 U' R2 D' R2 U R' x	 X]

	OLL	y2 r U' r2 U r2 U r2 U' r	 X]
	OLL	r' U r2 U' r2' U' r2 U r'	 X]

	OLL	y2 R' F R' F' R2 d2 y' R' F R F'	 X]
	OLL	R B' R B R2' U2 F R' F' R	 X]

	OLL	y2 r U2 R2' U' R2 U' rR' U2 R	 X]
	OLL	y2 l' U l2 U' l2 U' l2 U l'	 X]

	OLL	(y' x') U l' U2 R U2 l U2 R' U (x)	 X]
	OLL	r' U2 R2' U R2 U rR U2 R'	 X]

	OLL	y' R' U2 R U R' U R F R U R' U' F'	 X]
	OLL	y' (R U2 R' U' R U' R') (F R U R' U' F')	 X]

	OLL	y' F' R U2 R' U2 R' F2 R F'	 X]
---	-----	---	---

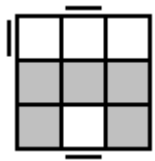
	OLL	(y x') U' r U2 L' U2 r' U2 L U'(x)	 X]
---	-----	--	---

	OLL	<u>U' F' R U2 R' U2 R' F2 R F'</u>	 [X]
---	-----	------------------------------------	---

	OLL	<u>y' F R U' R' U' R U R' U R</u> <u>U' R' F'</u>	 [X]
---	-----	--	---

"C" shapes

OLL 34

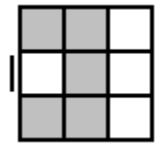


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 46



Name:

Used in: OLL

Optimal moves: 8 [HTM](#)

	OLL	<u>R U R' U' x D' R' U R E' z'</u>	 [X]
---	-----	------------------------------------	---

	OLL	<u>R' U R' F R F' U R</u>	 [X]
---	-----	---------------------------	---

	OLL	<u>y2 R' U' R U y' x' R U L' U'</u> <u>M'</u>	 [X]
---	-----	--	---

	OLL	<u>R' U' l' U l F' U R</u>	 [X]
---	-----	----------------------------	---

	OLL	<u>R U R' U' y' r' U' R U M'</u>	 [X]
---	-----	----------------------------------	---

	OLL	<u>y F U F l' U l U' F'</u>	 [X]
---	-----	-----------------------------	---

	OLL	<u>(R U R' U') B' l' U R d' D</u>	 [X]
---	-----	-----------------------------------	---

	OLL	<u>R U l U' R' U F l'</u>	 [X]
---	-----	---------------------------	---

	OLL	<u>(R U R' U') B' (R' F R F') B</u>	 [5]]
---	-----	-------------------------------------	--

	OLL	<u>y2 L F U' R U R' F' L'</u>	 [X]
---	-----	-------------------------------	---

	OLL	<u>R U R' d' l' U' L U r' R</u>	 [X]
---	-----	---------------------------------	---

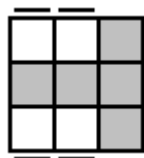
	OLL	<u>R U R'2 U' R' F R U R U' F'</u>	 [X]
---	-----	------------------------------------	---

	OLL	<u>R U R'2 U' R' F R U R U' F'</u>	 [X]
---	-----	------------------------------------	---

	OLL	<u>y2 F R U R' U' R' F' r U R U' r'</u>	
			X]

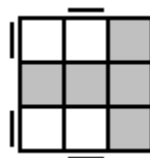
"T" shapes

OLL 33



Name:
Used in: OLL
Optimal moves: 8 [HTM](#)

OLL 45



Name:
Used in: OLL
Optimal moves: 6 [HTM](#)

	OLL	<u>(R U R' U') (R' F R F')</u>	
			X]

	OLL	<u>F (R U R' U') F'</u>	
			X]

	OLL	<u>y2 (L' U' L U) (L F' L' F)</u>	
			X]

	OLL	<u>f' (U' L' U L) f</u>	
			X]

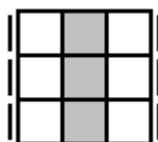
	OLL	<u>R' U' R U l U' R' U (x)</u>	
			X]

	OLL	<u>y2 f (U R U' R') f</u>	
			X]

	OLL	<u>y2 F' (L' U' L U) F</u>	
			X]

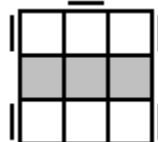
"I" shapes

OLL 55



Name:
Used in: OLL
Optimal moves: 11 [HTM](#)

OLL 56



Name:
Used in: OLL
Optimal moves: 11 [HTM](#)

	OLL	<u>R U2 R2 U' R U' R' U2 F R F'</u>	
			X]

	OLL	<u>r U r' U R U' R' U R U' R' r U' r'</u>	
			X]

	OLL	<u>R' U2 R2 U R' U R U2 y l' U' l</u>	

	OLL	<u>r' U' r U' R' U R U' R' U R r' U r</u>	

			X]				X]
--	--	--	----	--	--	--	----

	OLL	<u>r U2 R2 F R F' U2 r' F R F'</u>	 [		OLL	<u>L F L' U R U' R' U R U' R' L F' L'</u>	 [
			X]				X]

	OLL	<u>y R' F R U R' F R U' R' F' R U M' U' M</u>	 [		OLL	<u>F R U R' U' R F' r U R' U' r'</u>	 [
			X]				X]

	OLL	<u>L F' L' U' L F' L' U L F L' U' M' U M</u>	 [		OLL	<u>r U r' U R U' R' M' U R U2 r'</u>	 [
			X]				X]

	OLL	<u>(L F' L' U' L F' L' U L F L' U' L)(R' F R) L'</u>	 [		OLL	<u>F R U R' U' F' r U R' U' r' F R F'</u>	 [
			X]				X]

	OLL	<u>R d' R2 D R' U2 R D' R2 d R'</u>	 [
			X]

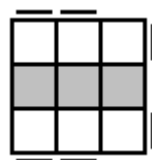
	OLL	<u>y r U2 R' U' R2 r' U R' U' r U' r'</u>	 [
			X]

	OLL	<u>y F R U R' U' F' R U2 R2 U' R2 U' R2 U2 R</u>	 [
			X]

A 4x4x4 special: Note: Rra = (R + r) + (L + l) ::

(y) Rr U2 Rra' U2 Rr U2 Rr' U2 Rra U2 Rr'

OLL 51

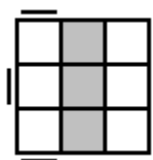


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 52



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	<u>F U R U' R' U R U' R' F'</u>	 [		OLL	<u>R' U' R U' R' d R' U R B</u>	 [
			X]				X]

	OLL	<u>y2 f R U R' U' R U R' U' f</u>	 X]
---	-----	---	---

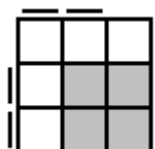
	OLL	<u>R U R' U R d' R U' R' F'</u>	 X]
---	-----	---	---

	OLL	<u>y2 R' U' x U R' U' R U R' U' R x' U R</u>	 X]
---	-----	--	---

	OLL	<u>(R U R' U R U2 R') U (F U R U' R' F')</u>	 X]
---	-----	--	---

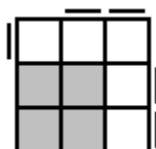
Square shapes

OLL 5



Name:
Used in: OLL
Optimal moves: 7 [HTM](#)

OLL 6



Name:
Used in: OLL
Optimal moves: 7 [HTM](#)

	OLL	<u>(r' U2) (R U R' U r)</u>	 1 X]
---	-----	---	--

	OLL	<u>y2 (r U2) (R' U' R U') r'</u>	 X]
---	-----	--	---

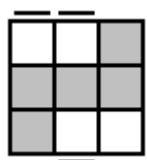
	OLL	<u>y2 R' F2 L F L' F R</u>	 1 X]
---	-----	--	--

	OLL	<u>l U2 L' U' L U' l'</u>	 X]
---	-----	---	---

	OLL	<u>y2 l' U2 L U L' U l</u>	 X]
---	-----	--	---

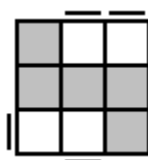
Big lightning bolt shapes

OLL 39



Name:
Used in: OLL
Optimal moves: 9 [HTM](#)

OLL 40



Name:
Used in: OLL
Optimal moves: 9 [HTM](#)

	OLL	<u>L F' L' U' L U F U' L'</u>	 X]
---	-----	---	---

	OLL	<u>R' F R U R' U' F' U R</u>	 X]
---	-----	--	---

	OLL	<u>y2 f L F L' U' L' U L S</u>	 X]
	OLL	<u>y2 f R' F' R U R U' R' S'</u>	 X]

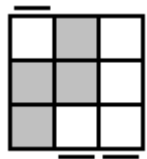
	OLL	<u>y2 R U R' F' U' F U R U2 R'</u>	 X]
	OLL	<u>y2 L' B L U L' U' B' U L</u>	 X]

	OLL	<u>y2 R B' R' U' R U B U' R'</u>	 X]
---	-----	--	---

	OLL	<u>y2 x' R U' x R' U' R U x' U F'</u> <u>l'</u>	 X]
---	-----	--	---

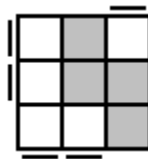
Small lightning bolt shapes

OLL 7



Name:
Used in: OLL
Optimal moves: 7 [HTM](#)

OLL 8



Name:
Used in: OLL
Optimal moves: 7 [HTM](#)

	OLL	<u>r U R' U R U2 r'</u>	 X]
	OLL	<u>l' U' L U' L' U2 l</u>	 X]

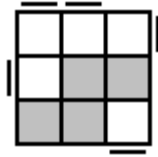
	OLL	<u>y B L F' L F L2 B'</u>	 X]
	OLL	<u>y2 r' U' R U' R' U2 r</u>	 X]

	OLL	<u>F R' F' R U2 R U2 R'</u>	 X]
	OLL	<u>y' B' R' F R' F' R2 B</u>	 X]

	OLL	<u>L' U2 L U2 L F' L' F</u>	 X]
	OLL	<u>R U2 R' U2 R' F R F'</u>	 X]

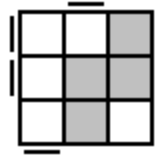
OLL 11

OLL 12



Name:

Used in: OLL

Optimal moves: 11 [HTM](#)

Name:

Used in: OLL

Optimal moves: 11 [HTM](#)

	OLL	r' R2 U R' U R U2 R' U r R'	 [X]
---	-----	---	---

	OLL	F R U R' U' F' U F R U R' U' F'	 [X]
---	-----	---	---

	OLL	y2 r U R' U R' F R F' R U2 r'	 [X]
---	-----	---	---

	OLL	y F R U R2 F R y' R2 U R U2 R'	 [X]
---	-----	--	---

	OLL	y F' L' U' L U F y F R U R' U' F'	 [X]
---	-----	---	---

	OLL	y' r R2 U' R U' R' U2 R U' R r'	 [X]
---	-----	---	---

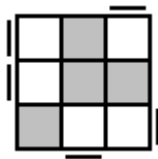
	OLL	R U R' y' U' R' U' R y U R' F' R U R' U' R' F	 [X]
--	-----	---	--

	OLL	y' M' R' U' R U' R' U2 R U' M	 [X]
--	-----	---	--

	OLL	y R U' R' U' R U' R' U2 F' U F U' R U R'	 [X]
---	-----	--	---

Fish shapes

OLL 9

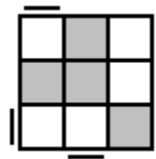


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 10



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	y' R' U' R y' x' R U' R' F R U R' x	 [X]
---	-----	---	---

	OLL	y' R U R' y R' F R U' R' F' R	 [X]
---	-----	---	---

	OLL	y' R' U' R x U' R' U y R U y' R U' x'	 [X]
---	-----	---	---

	OLL	y' R U R' y' r' U r U' r' U' r	 [X]
---	-----	--	---

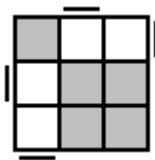
	OLL	y' R U R' U' R' F R2 U R' U' F'	 [X]
---	-----	---	---

	OLL	y' R U R' U R' F R F' R U2 R'	 [X]
---	-----	---	---

			X]				X]
--	--	--	----	--	--	--	----

	OLL	<u>y L' U' L y l U' l' U l U l'</u>	 X]		OLL	<u>y' R' U' R U R B' R2 U' R U</u> <u>B</u>	 X]
---	-----	-------------------------------------	---	---	-----	--	---

OLL 35

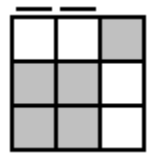


Name:

Used in: OLL

Optimal moves: 9 [HTM](#)

OLL 37



Name:

Used in: OLL

Optimal moves: 8 [HTM](#)

	OLL	<u>R U2 R2' F R F' R U2 R'</u>	 X]		OLL	<u>x' U' R U l' U' R' U R</u>	 X]
---	-----	--------------------------------	---	---	-----	-------------------------------	---

	OLL	<u>R U B' R B R2 U R U2 R'</u>	 X]		OLL	<u>l U' R' U y' R U R' U' z'</u>	 X]
---	-----	--------------------------------	---	---	-----	----------------------------------	---

	OLL	<u>U' M2 F' U2 F M U2 R U L'</u> <u>x'</u>	 X]		OLL	<u>y F R U' R' U' R U R' F'</u>	 X]
---	-----	---	---	---	-----	---------------------------------	---

	OLL	<u>U' S2 L U2 L' S' U2 B' U' F</u> <u>z'</u>	 X]		OLL	<u>y R' F R F' U' F U F</u>	 X]
---	-----	---	---	---	-----	-----------------------------	---

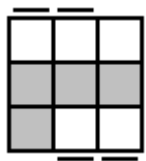
	OLL	<u>y' R' U2 (R l) U' R' U l' U2 R</u>	 X]		OLL	<u>y R' F R F' y' U' R' U R</u>	 X]
---	-----	---------------------------------------	---	---	-----	---------------------------------	---

	OLL	<u>y F R' F' R U R U' R'</u>	 X]
---	-----	------------------------------	---

	OLL	<u>R B' R' B U B U' B'</u>	 X]
---	-----	----------------------------	---

Knight move shapes

OLL 13

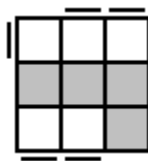


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 14



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	F U R U' R2 F' R U R' U' R'	
			X]

	OLL	R' F R U R' F' R y' R U' R'	
			X]

	OLL	F U R U2 R' U' R U R' F'	
			X]

	OLL	l' U l U l' U' l y' R U' R'	
			X]

	OLL	r U' r' U' r U r' y' R' U R	
			X]

	OLL	y' R' U' y' R' U R2 B R' U' R' U R	
			X]

	OLL	y2 x' R U' R' F' R U R' x y R' U R	
			X]

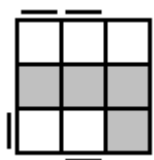
	OLL	y2 B' U' R' U R2 B R' U' R' U R	
			X]

	OLL	y2 f R U R2 U' R' U R U' f	
			X]

	OLL	y2 x' L' U L F L' U' L x y' L U' L'	
			X]

	OLL	y2 r' U r U r' U' r y R U' R'	
			X]

OLL 15

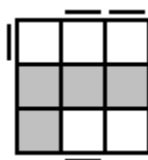


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 16



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	y2 l' U' l L' U' L U l' U l	
			X]

	OLL	y2 r U r' R U R' U' r U' r'	
			X]

	OLL	y2 R' F' R L' U' L U R' F R	

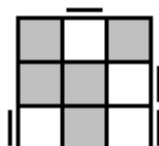
	OLL	y2 r U M U R' U' r U' r'	

			X]				X]
--	--	--	----	--	--	--	----

	OLL	<u>$r' U' r R' U' R U r' U r$</u>	 X]		OLL	<u>$y^2 F' R U R' U' R' F R U' y'$</u> <u>$R' U R U y R U' R'$</u>	 X]
---	-----	--	---	---	-----	---	---

Awkward shapes

OLL 29

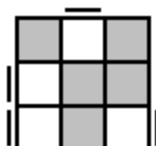


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 30



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	<u>$y^2 R' F R F' R U^2 R' d' L' U'$</u> <u>$L$</u>	 X]		OLL	<u>$y^2 F R' F R^2 U' R' U' R U R'$</u> <u>$F^2$</u>	 X]
---	-----	--	---	---	-----	---	---

	OLL	<u>$y^2 R' F R F' R U^2 R' U' y' R'$</u> <u>$U' R$</u>	 X]		OLL	<u>$l U' R' U' l' U^2 R d L U L'$</u>	 X]
--	-----	---	---	--	-----	--	---

	OLL	<u>$y^2 R^2 U' R F R' U R^2 U' R'$</u> <u>$F' R$</u>	 X]		OLL	<u>$f R U R^2 U' R' U R^2 U' R' f$</u>	 X]
---	-----	---	---	---	-----	---	---

	OLL	<u>$y (R U R' U') (R U' R' F') U'$</u> <u>$(F R U R')$</u>	 X]		OLL	<u>$y^2 F U R U' x' U R' D' R U'$</u> <u>$R'$</u>	 X]
---	-----	---	---	---	-----	--	---

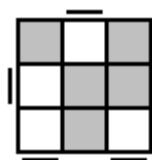
	OLL	<u>$y R' U^2 R^2 U R' U' R' U^2 F$</u> <u>$R F'$</u>	 X]		OLL	<u>$R^2 U R' B' R U' R^2 U R B$</u> <u>$R'$</u>	 X]
---	-----	---	---	---	-----	--	---

	OLL	<u>$M U (R U R' U') (R' F R F')$</u> <u>$M'$</u>	 X]		OLL	<u>$M U' (L' U' L U) (L F' L' F)$</u> <u>$M'$</u>	 X]
---	-----	---	---	---	-----	--	---

	OLL	<u>$y^2 r U^2 R' U' R U' r' R' U^2 R$</u> <u>$U R' U R$</u>	 X]		OLL	<u>$y^2 M' U' (R' U' R U) x (R U'$</u> <u>$R' U) M x$</u>	 X]
---	-----	--	---	---	-----	--	---

	OLL	<u>r2 D' r U r' D r2 U' r' U' r</u>	 [X]
	OLL	<u>r' U2 R U R' U r R U2 R' U' R U' R'</u>	 [X]

OLL 41

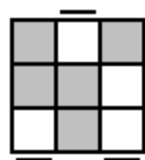


Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

OLL 42



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	<u>R U' R' U2 R U y R U' R' y' U' R'</u>	 [X]
	OLL	<u>r' R2 y R U R' U' y' R' U M'</u>	 [X]

	OLL	<u>y R U2' R' U' R U' R2 (y) L' U' L U F</u>	 [X]
	OLL	<u>R' U' R U F R U R' U' R' U R U' F'</u>	 [X]

	OLL	<u>y2 F U R U' R' F' R' U2 R U R' U R</u>	 [X]
	OLL	<u>L' U L U2 L' U' y' L' U L U F</u>	 [X]

	OLL	<u>y2 R U R' U R U2 R' F R U R' U' F'</u>	 [X]
	OLL	<u>y R' U2 R U R' U R2 y R U R' U' F'</u>	 [X]

	OLL	<u>y2 r R2 y' R' U' R U y R U' M</u>	 [X]
	OLL	<u>y (R' F R F')*2 R U R' U' R U R'</u>	 [X]

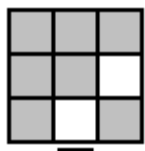
	OLL	<u>y2 R2 L z' l' U' R d L U' L l'</u>	 [X]
	OLL	<u>y2 L2 R' z r U L' d' R' U R' r</u>	 [X]

	OLL	<u>y' (L F' L' F)*2 L U' L' U L U' L</u>	 [X]
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All Corners Oriented

OLL 28

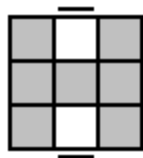
OLL 57



Name:

Used in: OLL

Optimal moves: 9 [HTM](#)



Name:

Used in: OLL

Optimal moves: 10 [HTM](#)

	OLL	r U R' U' r' R U R' U' R'	 X]		OLL	R U R' U' r R' U R U' r'	 X]
	OLL	y r U2 R' U' R U' r' R U R' U' R U2 R'	 X]		OLL	(x') M' U' R U M U' R' U (x)	 X]
	OLL	r U R' U R U2 r' R U2 R' U' R U' R'	 X]		OLL	R' U' R U M U' R' U r	 X]
	OLL	y r' U' R U' R' U2 r R' U2 R U R' U R	 X]		OLL	M U M U M U2 M' U M' U M'	 X]
	OLL	y' r' U' R U M' U' R' U R	 X]		OLL	M' U' M' U' M' U' U2 M U' M U' M	 X]
	OLL	r' U2 R U R' U r R' U' R U' R' U2 R	 X]		OLL	M U M' U' M U M' U M U2 M'	 X]
	OLL	F R U R' U' F' U2 F R U R' U' F'	 X]		OLL	M' U' M U M' U' M U' M' U2 M	 X]
	OLL	F R U R' U' F2 L' U' L U F	 X]		OLL	M U M2 U2 M U M U2 M U' M' U' M'	 X]
	OLL	M U M' U2 M U M'	 X]		OLL	M' U' M2 U2 M' U' M' U2 M' U M U M	 X]

	OLL	<u>y M U' M' U2 M U' M'</u>	 [X]		OLL	<u>M2 U' M U M' U M' U' M'</u> <u>U' M' U M</u>	 [X]
	OLL	<u>y2 M' U M U2 M' U M</u>	 [X]		OLL	<u>M2 U' M' U M U M U' M U'</u> <u>M U M'</u>	 [X]
	OLL	<u>y' M U M2 U M' U2 M U M</u>	 [X]		OLL	<u>y M' U M' U M' U M' U M'</u> <u>U' M' U' M' U' M'</u>	 [X]
	OLL	<u>M U M U M' U' M U' M U</u> <u>M</u>	 [X]		OLL	<u>y M' U M U M' U M U' M'</u> <u>U' M</u>	 [X]
	OLL	<u>M U M' U M U2 M' U' M U'</u> <u>M'</u>	 [X]		OLL	<u>y M' U' M U' M' U' M U M'</u> <u>U M</u>	 [X]
	OLL	<u>y M U' M U' M' U M U M U'</u> <u>M</u>	 [X]		OLL	<u>y M U' M' U' M U' M' U M</u> <u>U M'</u>	 [X]
	OLL	<u>y2 M U' M2 U' M' U2 M U'</u> <u>M</u>	 [X]		OLL	<u>y M U M' U M U M' U' M U'</u> <u>M'</u>	 [X]
	OLL	<u>y' M U M' U M U M' U M U</u> <u>M'</u>	 [X]		OLL	<u>M U M' U' F2 M U M' U' F2</u>	 [X]
	OLL	<u>y' M' U' M U M U M U' M</u> <u>U' M' U M2</u>	 [X]		OLL	<u>M' U' M U F2 M' U' M U F2</u>	 [X]
	OLL	<u>y' M2 U M' U2 M U M U M</u> <u>U2 M' U M</u>	 [X]		OLL	<u>M2 U' F2 U' M' U M2 F2 U</u> <u>M</u>	 [X]
	OLL	<u>y2 M' U M U' M U' M U M</u> <u>U M' U' M2</u>	 [X]		OLL	<u>F M' F U M2 U2 M2 U F' M</u> <u>F'</u>	 [X]

			X]				X]
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	OLL	<u>M U' M2 U2 M' U' M U2 M</u> <u>U' M U' M'</u>	 [X]
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	OLL	<u>y' M' U' F2 M2 U' M U F2 U</u> <u>M2</u>	 [X]
---	-----	--	---

	OLL	<u>y2 M' U F2 M2 U M U' F2</u> <u>U' M2</u>	 [X]
---	-----	--	---

	OLL	<u>R' F R S R' F' R S'</u>	 [X]
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	OLL	<u>L2 S U' S' U L2 U S U S'</u>	 [X]
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	OLL	<u>y L F' L' S' L F L S</u>	 [X]
---	-----	-----------------------------	---