

Método
**Avançado
Fridrich**

CUBO

Velocidade

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Introdução:

O Método Avançado do Cubo Mágico 3x3x3 é chamado Fridrich. Foi desenvolvido pela watermarking Jessica Fridrich; contém 119 formulas divididas em 4 passos:

1º Cruz branca - Solução intuitiva.

2º F2L - Finish Two Layers - 41 casos

3º OLL - Orientation Last Layer - 57 casos

4º PLL - Permutation Last Layer - 21 casos

Este método é grande e trabalhoso, porém, o resultado é excelente. Antes de tudo, procure entender bem todos os processos do método; depois, entenda as formulas e decore.

Dica: Inicie aprendendo o F2L pois é um passo mais intuitivo e fácil de entender. Depois aprenda os 7 casos de OLL com a cruz amarela pronta, decore então os 21 casos de PLL e por fim, os 50 restantes do OLL. Procure não apenas decorar os movimentos, mas sim entender; fica mais fácil e o resultado é melhor!

Apostila escrita e desenvolvida por Renan Cerpe –Versão 1.4



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Movimentos Avançados

Além dos movimentos básicos que você obrigatoriamente deve saber, tais como F B R L U e D, incluindo as variações de movimentação dupla (exemplo: F2) e movimentação anti-horária (exemplo: F'), vamos aprender novos movimentos que serão utilizados no Método Avançado Fridrich.

Vamos adicionar os movimentos de camada dupla, onde as letras que representam são minúsculas; confira o exemplo:

Cubo Montado	f	f'	f2
			

Movimentação do cubo todo (leve em consideração a figura do Cubo Montado) e das camadas internas do cubo:

M 	M' 	S 	S' 
E 	E' 	x 	x' 
y 	y' 	z 	z' 

1º Passo: Solucionar a cruz branca




O primeiro passo do Método Avançado é solucionar a cruz branca. Este passo não possui nenhuma formula específica.





Dica: Inicie a solução com a cor branca na sua base, fazendo a cruz na base do cubo; assim, você terá uma visão melhor para iniciar o F2L.

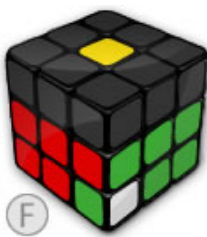















2º Passo: Finalizar a 2ª camada – F2L











Você provavelmente deve ter o costume de solucionar primeiramente as quinas brancas e depois colocar um meio de cada vez para finalizar a 2ª camada. Agora, vamos solucionar uma quina e um meio simultaneamente, ou seja, neste passo, utilizaremos 4 formulas, uma de cada vez para solucionar os 4 lados (cada um com sua quina e meio correspondente). Este passo está subdividido em categorias de acordo com a posição das peças: - O símbolo "F" das figuras, representa onde esta a face do cubo. Posicione seu cubo na mesma posição antes de aplicar a formula.











<p>Caso Dd1 R U' R' d R' U2 R U2' R' U R</p>  <p>Diagrama de um cubo de Rubik's 3x3x3 para o Caso Dd1. A face branca está no topo. A face vermelha está na frente (F). A face verde está na esquerda. A face amarela está no topo. A face azul está na direita. A face preta está na base.</p>	<p>Caso Dd2 U R U' R' d' L' U L</p>  <p>Diagrama de um cubo de Rubik's 3x3x3 para o Caso Dd2. A face branca está no topo. A face vermelha está na frente (F). A face verde está na esquerda. A face amarela está no topo. A face azul está na direita. A face preta está na base.</p>	<p>Caso Dd3 U' L' U L d R U' R'</p>  <p>Diagrama de um cubo de Rubik's 3x3x3 para o Caso Dd3. A face branca está no topo. A face vermelha está na frente (F). A face verde está na esquerda. A face amarela está no topo. A face azul está na direita. A face preta está na base.</p>
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<p>Caso Fd1 $R^2 U^2 R' U' R U'$ $R' U^2 R'$</p> 	<p>Caso Fd2 $F' L' U^2 L F R U R'$</p> 	<p>Caso Fd3 $L' U' L U L' U' L$</p> 	<p>Caso Fd4 $R U' R' U R U' R'$</p> 
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<p>Caso Rd1 $R U^2 R' U R U' R$ $U^2 R^2$</p> 	<p>Caso Rd2 $R U' R' F' L' U^2 L F$</p> 	<p>Caso Rd3 $L' U L U' L' U L$</p> 	<p>Caso Rd4 $R U R' U' R U R'$</p> 
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<p>Caso U1 $RUR'U'RUR'U'$ RUR'</p> 	<p>Caso U2 $RU'R'yL'U2L$</p> 	<p>Caso U3 $L'U2LU'L'U'L$</p> 	<p>Caso U4 $U2R2U2R'U'R$ $U'R2$</p> 
<p>Caso U5 $L'U2LU'L'UL$</p> 	<p>Caso U6 $RUR'URU'R'$</p> 	<p>Caso U7 $L'U'L'U'L'UL$</p> 	<p>Caso U8 $RU2R'URU'R'$</p> 
<p>Caso U9 $U2L2U2LU$ $L'UL2$</p> 	<p>Caso U10 $RU2R'U'RUR'$</p> 		

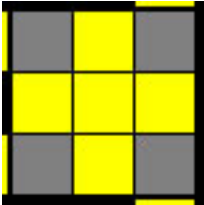
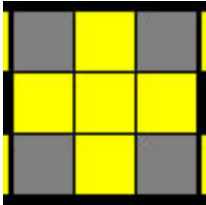
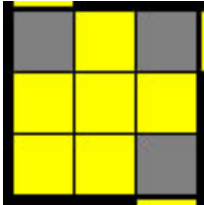
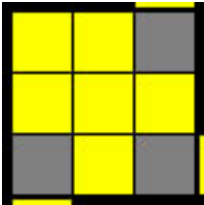
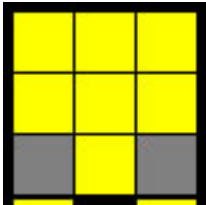
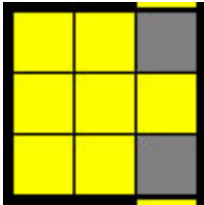
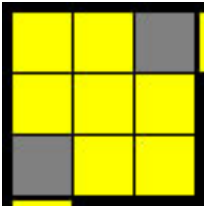
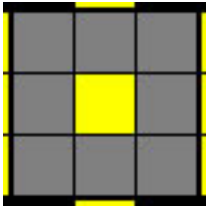
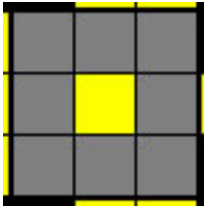
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<p>Caso R5 $R U' R' U d$ $R' U' R$</p> 	<p>Caso R6 $U' R U' R' U$ $R U R'$</p> 	<p>Caso R7 $R U R'$</p> 	<p>Caso R9 $d R' U^2$ $R U^2 R' U R$</p> 
<p>Caso R8 $U' R U R'$ $U R U R'$</p> 	<p>Caso R10 $U L' U' L$ $U^2 L' U L$</p> 		

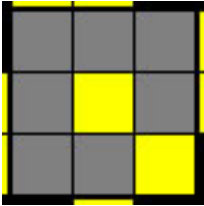
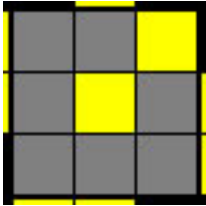
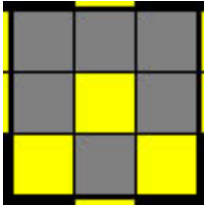
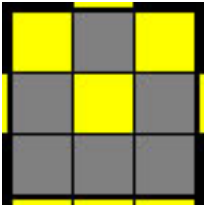
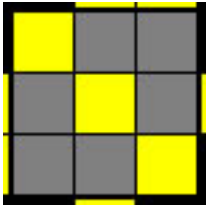
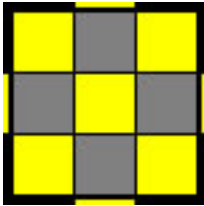
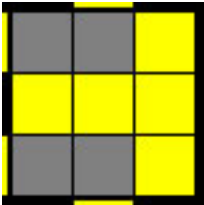
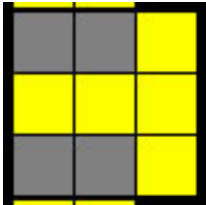
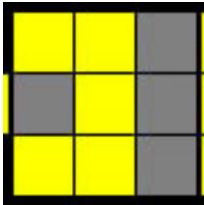
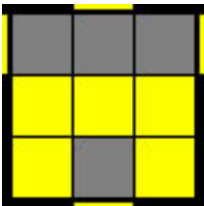
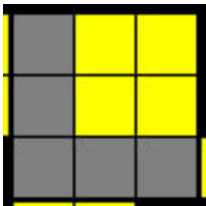
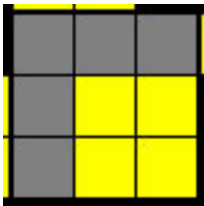
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<p>Caso F5 $L' U L U' d'$ $L U L'$</p> 	<p>Caso F6 $U L' U L U'$ $L' U' L$</p> 	<p>Caso F7 $L' U' L$</p> 	<p>Caso F8 $d' L U^2 L' U^2$ $L U' L'$</p> 
<p>Caso F9 $U L' U' L U'$ $L' U' L$</p> 	<p>Caso F10 $U' R U R' U^2$ $R U' R'$</p> 		

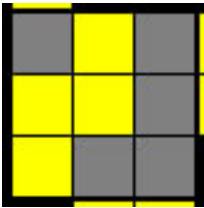
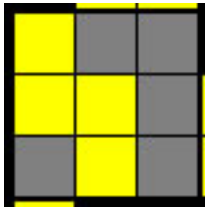
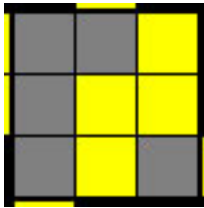
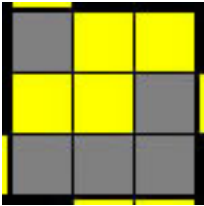
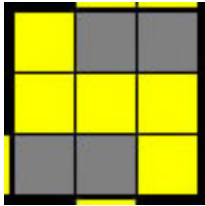
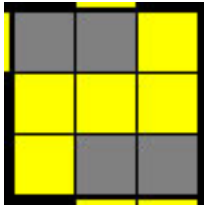

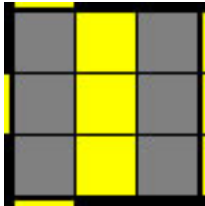
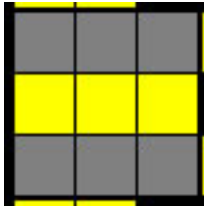
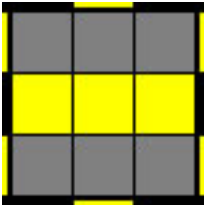
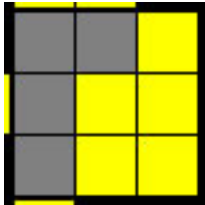
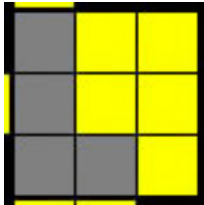
3º Passo: Orientar a última camada – OLL

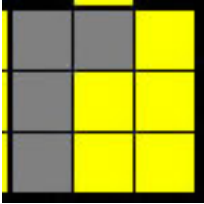
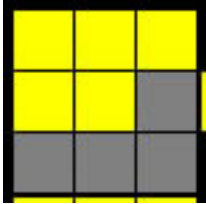
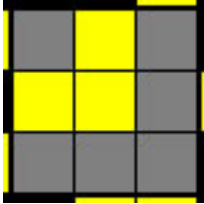
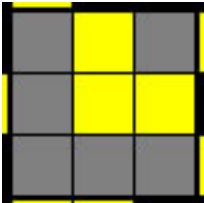
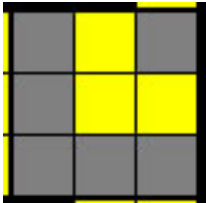
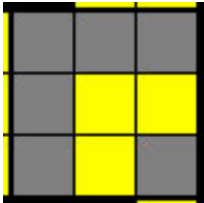
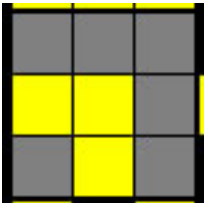
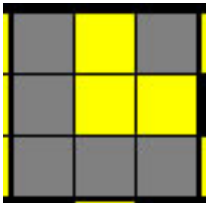
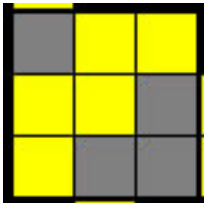
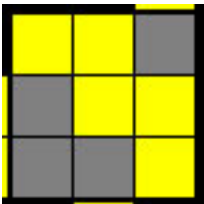
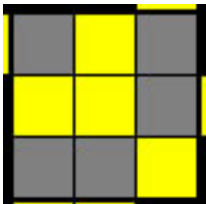
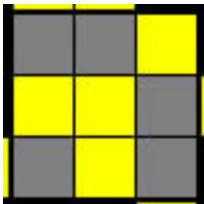
Neste passo vamos orientar todas as peças amarelas, ou seja, colocar todos os amarelos no topo do cubo utilizando apenas 1 dos 57 casos.

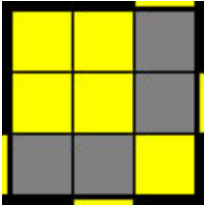
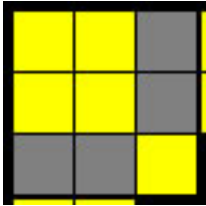
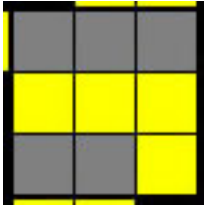
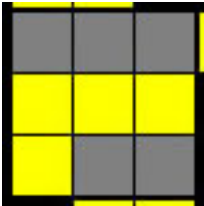
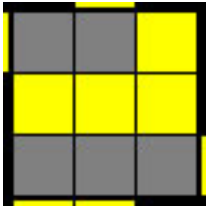
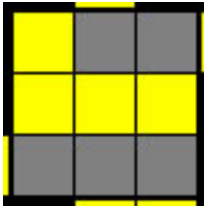
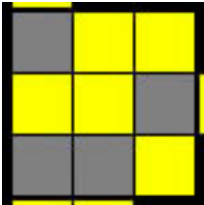
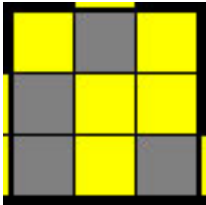
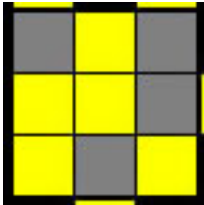
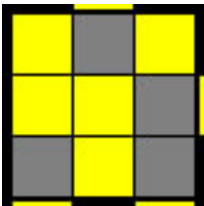
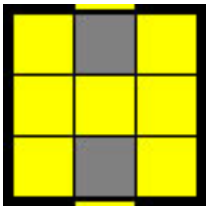
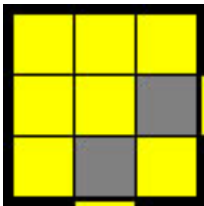
Esta é a visão do *topo* do cubo. Para aplicar a formula escolhida, posicione seu cubo na mesma posição da figura com a cor Amarelo no *topo*.

<p>Caso 1 R U2 R2 U' R2 U' R2 U2 R</p> 	<p>Caso 2 R U R' U R U' R' U R U2 R'</p> 	<p>Caso 3 R U R' U R U2 R'</p> 
<p>Caso 4 R' U' R U' R' U2 R</p> 	<p>Caso 5 R2 D R' U2 R D' R' U2 R'</p> 	<p>Caso 6 R' F' L F R F' L' F</p> 
<p>Caso 7 R' F R B' R' F' R B</p> 	<p>Caso 8 R U2 R2' F R F' U2' R' F R F'</p> 	<p>Caso 9 F R U R' U' S R U R' U' f'</p> 

<p>Caso 10 fRUR'U'f'U'FR UR'U'F'</p> 	<p>Caso 11 fRUR'U'f'UFR UR'U'F'</p> 	<p>Caso 12 rU2R'U'R U'r2U2 RUR'Ur</p> 
<p>Caso 13 rUR'URU2r2U' RU'R'U2r</p> 	<p>Caso 14 RUR'UR'FRF' U2R'FRF'</p> 	<p>Caso 15 MURUR'U'M2 URU'r'</p> 
<p>Caso 16 FRUR'U'F'</p> 	<p>Caso 17 RUR'U'R'FRF'</p> 	<p>Caso 18 R'U'R'FRF'UR</p> 
<p>Caso 19 RUR2U'R'FRURU'F'</p> 	<p>Caso 20 rU2R'U'R U'r'</p> 	<p>Caso 21 r'U2RUR'Ur</p> 

<p>Caso 22 r U R' U R U2 r'</p> 	<p>Caso 23 r' U' R U' R' U2 r</p> 	<p>Caso 24 F R U R' U' F' y F R U R' U' F'</p> 
<p>Caso 25 r U R' U R' F R F' R U2 r'</p> 	<p>Caso 26 L' B L U L' U' y' L' U F</p> 	<p>Caso 27 R B' R' U' R U y R U' F'</p> 
<p>Caso 28 R' U2 R2 U R' U R U2 x' U' R' U x</p> 	<p>Caso 29 R U R' U R d' R U' R' F'</p> 	<p>Caso 30 F U R U' R' U R U' R' F'</p> 
<p>Caso 31 r' U' r U' R' U R U' R' U M U r</p> 	<p>Caso 32 R U B' U' R' U R B R'</p> 	<p>Caso 33 R' U' F U R U' R' F' R</p> 

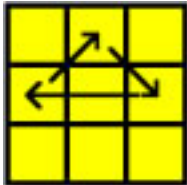
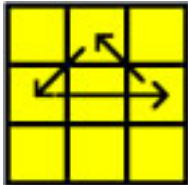
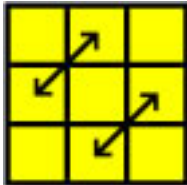
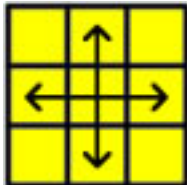
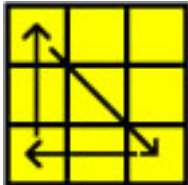
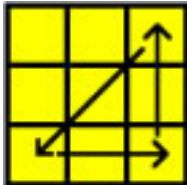
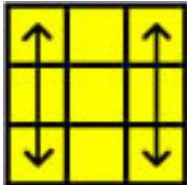
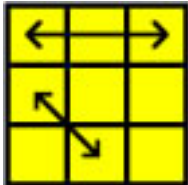
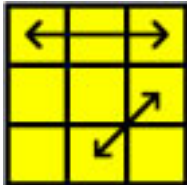
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<p>Caso 37 F' L' U' L U L' U' L U F</p> 	<p>Caso 38 r U' r2 U r2 U r2 U' r</p> 	<p>Caso 39 r' U r2 U' r2' U' r2 U r'</p> 
<p>Caso 40 r' U2 R U R' U' R U R' U r</p> 	<p>Caso 41 r U R' U R U' R' U R U2 r'</p> 	<p>Caso 42 R U R' U R U' R' U' R' F R F'</p> 
<p>Caso 43 L' U' L U' L' U L U L F' L' F</p> 	<p>Caso 44 R U R' U' R' F R2 U R' U' F'</p> 	<p>Caso 45 R' U' R U l U' l' R' U' R U B</p> 

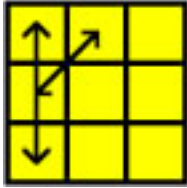
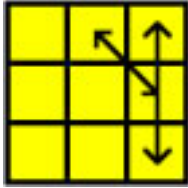
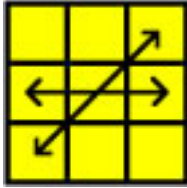
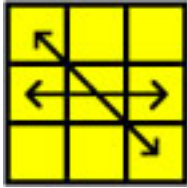
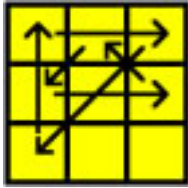
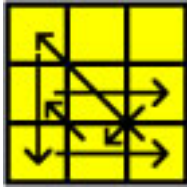
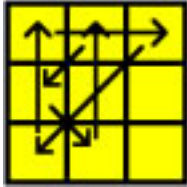
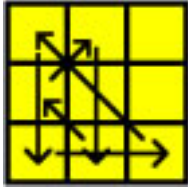
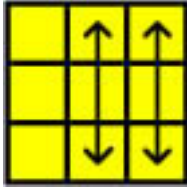
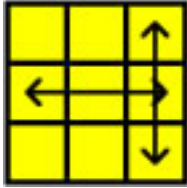
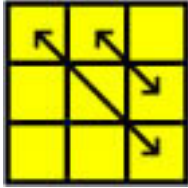
<p>Caso 46 L U2 L2 B L B' L U2' L'</p> 	<p>Caso 47 F R' F' R U R U' R'</p> 	<p>Caso 48 R' F R U R' F' R y' R U' R'</p> 
<p>Caso 49 r U' r' U' r U r' y' R' U R</p> 	<p>Caso 50 r U M U R' U' r U' r'</p> 	<p>Caso 51 l' U' M U' L U l' U l</p> 
<p>Caso 52 L2 U' L B L' U L2 U' r' U' r</p> 	<p>Caso 53 f R U R2 U' R' U R2 U' R' f'</p> 	<p>Caso 54 R U R' U R U2 R' F R U R' U' F'</p> 
<p>Caso 55 R' U' R U' R' U2 R F R U R' U' F'</p> 	<p>Caso 56 R U R' U' M' U R U' r'</p> 	<p>Caso 57 r U R' U' M U R U' R'</p> 

4º Passo: Permutar a última camada – PLL

Neste passo vamos permutar as peças amarelas, ou seja, colocar cada uma em seu lugar e por fim, terminar a solução do cubo utilizando apenas 1 dos 21 casos.

Esta é a visão do topo do cubo. Para aplicar a formula escolhida, posicione seu cubo na mesma posição da figura com a cor amarelo no topo.

<p>Caso U Horário R' U R' U' R' U' R' U R U R2</p> 	<p>Caso U Anti-Horário R2 U' R' U' R U R U R U' R</p> 	<p>Caso Z M2 U M2 U M' U2 M2 U2 M' U2</p> 
<p>Caso H M2 U M2 U2 M2 U M2</p> 	<p>Caso A Horário x' L' U L' D2 L U' L' D2 L2 x</p> 	<p>Caso A Anti-Horário x' R U' R D2 R' U R D2 R2 x</p> 
<p>Caso E x' R U' R' D R U R' D' R U R' D R U' R' D' x</p> 	<p>Caso R 8 L U2' L' U2 L F' L' U' L U L F L2 U</p> 	<p>Caso R 9 R' U2 R U2' R' F R U R' U' R' F' R2 U'</p> 

<p>Caso J 10 $F2' R U L' U2 r U' L$ $U L2 x2$</p> 	<p>Caso J 11 $F2' L' U' r U2' l' U R'$ $U' R2 x2$</p> 	<p>Caso N 1-2 $U L U' R U2 L' U R' L$ $U' R U2 L' U R'$</p> 
<p>Caso N 2-1 $U' R' U L' U2 R U' L$ $R' U L' U2 R U' L$</p> 	<p>Caso G 18 $R2' u R' U R' U' R u'$ $R2 y R' U R$</p> 	<p>Caso G 19 $R2 u' R U' R U R' u$ $R2 y R U' R'$</p> 
<p>Caso G 20 $R U R' y' R2 u' R U' R'$ $U R' u R2$</p> 	<p>Caso G 21 $R' U' R y R2' u R' U R$ $U' R u' R2$</p> 	<p>Caso F $R' U' F' R U R' U' R' F R2$ $U' R' U' R U R' U R$</p> 
<p>Caso T $R U R' U' R' F R2 U' R'$ $U' R U R' F'$</p> 	<p>Caso V $R' U R' d' R' F' R2 U' R' U$ $R' F R F$</p> 	<p>Caso Y $F R U' R' U' R U R' F' R$ $U R' U' R' F R F'$</p> 