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1           The concepts & software herein are free.
2       This software runs on my MS windows-10 64-bit Operating system
3           on a computer with 24MB of memory.
4
5           Use the software at your own risk.
6           No warranties are expressed or implied.
7
8       Link: https://ftp.setterholm.com/worldPeace/Math/Rubik/
9       Jeff Setterholm, Lakeville, MN 55044 USA 2025.01.27
10      -----
11 01/27/2025 11:49 PM          140,751,594 MS-RC.zip  <- has all the files.
12                unzipped: 452,348,433 bytes
13      -----
14 This smaller .zip omits the four largest precomputed Zone files:
15 01/28/2025 12:02 AM          22,687,517 MS-RC-Baseline.zip  & unpacked at link.
16                unzipped: 24,555,190 bytes
17 and the four omitted files are in:
18 01/27/2025 09:38 PM          119,886,712 MS-RC-ZoneData.zip  not unpacked.
19                unzipped: 429,766,860 bytes
20 F:\Min-Steps-RC -----
21 01/27/2025 10:29 PM          2,359,174 Min-Steps.pdf  <- the technical report
22 01/27/2025 11:17 PM           8,697 MS0-Dir-Doc.txt  <- this file
23
24 The program was written in Fortran using Absoft ProFortran 21.0.1
25 and is close to being compliant with the Fortran 95 standard.
26 Absoft IDE builder:
27 01/25/2025 04:50 PM          42,210 MS-RC-64.atools
28 Source files- ~Fortran 95
29 01/25/2025 02:20 PM          12,418 MS1-Launch.f95
30 01/17/2025 04:56 PM          20,386 MS2-RC-NamesEtc.f95
31 01/25/2025 02:45 PM          38,650 MS3-RC-Workout.f95
32 01/19/2025 06:13 PM          15,178 MS4-RC-Emulator.f95
33 01/19/2025 03:39 PM          13,002 MS5-RC-ConCat.f95
34 01/25/2025 04:26 PM          31,621 MS6-RC-Solve.f95
35
36 ...for color-coded source- see subdirectory:
37 01/23/2025 01:43 PM  <DIR>          Source-ColorCodedPdf
38
39 The Executable file:                               In order to run this application:
40 01/25/2025 04:26 PM          633,344 MS-RC-64.exf  <-** change .exf to .exe **
41
42 Emulator data tables:
43 01/07/2025 12:48 PM          14,113 Data-AttConcat.txt
44 01/05/2025 07:46 PM          46,349 Data-Emulator.txt
45 01/14/2025 01:35 PM           6,341 Data-Indexer.txt
46 01/14/2025 01:26 PM           4,616 Data-nLAV.txt
47 Other tables & illustrations:
48 03/20/2024 06:44 PM           2,436 Data-Attitudes.txt
49 01/03/2025 01:30 PM           3,574 Data-Locations.txt
50 01/02/2025 06:52 PM          326,033 Attitudes-3D.jpg
51
52 The modes of operation are: Zone use, Zone generation, and scramble generation:
53 01/26/2025 10:25 AM          5,867 MS3.ini  <- selects the *.nml to use
54                from the list below. & run: MS-RC-64.exe
55 -----
56 Scramble generation- 3x3x3- use the first 8 cells for 2x2x2's:
57 01/23/2025 03:34 PM select           2,816 R3-ScrambleGen.nml
58 01/23/2025 06:01 PM           6,378 R3-ScrambleGen-Summary.txt
59 -----
60 Zone use- 2x2x2 scrambles- solve in the fewest moves:
61 01/23/2025 03:41 PM select           3,290 R2-ZoneUse.nml
62 01/26/2025 10:52 AM          29,170 R2-ZoneUse-Summary.txt  <-session summary

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63 -----
64 Zone use- 3x3x3- 3 Zones in play, but Zones #2 & #3 don't cooperate:
65 01/25/2025 04:05 PM 3,946 R3-ZoneUse.nml
66 01/25/2025 04:30 PM 31,919 R3-ZoneUse-Summary.txt
67 -----
68 Zone generation- Rubik forward-right-down cells quadrant [8,16,19,20]:
69 01/23/2025 03:48 PM select 6,391 R3Q-08161920-12.nml
70 01/23/2025 06:04 PM initializer 2,696 R3Q-08161920-12-Ein.bim <-binary
71 01/23/2025 06:04 PM Discords 253,440 R3Q-08161920-12-RrToDis.bim <-binary
72 01/23/2025 06:04 PM 26,031 R3Q-08161920-12-Summary.txt
73 Zone generation- Rubik non-quad corners [1,2,3,4,5,6,7]: [8] is fixed.
74 01/23/2025 03:49 PM select 6,359 R2C-1234567-6.nml
75 01/16/2025 05:24 PM 2,696 R2C-1234567-6-Ein.bim
76 01/16/2025 05:31 PM 232,696,380 R2C-1234567-6-RrAscii.txt
77 01/16/2025 05:31 PM 11,022,480 R2C-1234567-6-RrToDis.bim
78 01/16/2025 05:31 PM 33,180 R2C-1234567-6-Summary.txt
79 Zone generation- Rubik non-quad edges [9,10,11,12,13,14,15,17,18]:
80 01/23/2025 03:46 PM select 8,006 R3E-091011121314151718-6.nml
81 01/18/2025 12:33 AM 2,696 R3E-091011121314151718-6-Ein.bim
82 01/18/2025 02:46 AM 185,794,560 R3E-091011121314151718-6-RrToDis.bim
83 01/18/2025 02:46 AM 43,300 R3E-091011121314151718-6-Summary.txt
84 -----
85 01/23/2025 03:44 PM select 2,292 R3-All-12.nml
86 -----
87 01/23/2025 01:48 PM 150 z_Dir-here.bat
88 40 File(s) 433,239,288
89
90 F:\Min-Steps-RC\ReferencePdfs+Images -----
91 These seven .pdf files all have line numbers which are frequently referenced.
92
93 Be able to easily access this key reference .pdf:
94 01/27/2025 11:17 PM 876,899 MS0-Dir-Doc-txt.pdf #0
95
96 Fortran 95 .pdf`s: created using an Absoft Pro Fortran 2022 compiler:
97 The .pdf source codes also include syntax color-codes. (Red text: comments)
98 01/25/2025 04:32 PM 1,117,113 Ms1-Launch-f95.pdf #1
99 Module MS1Def #1L17+ -boilerplate variables
100 Program MS1Launch #1L63+ -opens cOutFile
101 -calls ReadYourNml()
102 -transfers control to ImportEin()
103 Subroutine SaveOutFile #1L147+ -closes/opens cOutFile
104 Subroutine Jdate22() #1L162+ -world dates &times
105 Subroutine nRunSec() #1L195+ -big, precise interval clocks
106 Subroutine MyLenTrim() #1L295+ -truncates strings
107 Subroutine Beamer() #1L280+ -progress bar
108 ^^^:these are .pdf line numbers
109
110 01/23/2025 06:18 PM 1,690,381 MS2-RC-NamesEtc-f95.pdf #2
111 Module MS2RCDef #2L14+ -Min-Steps & RC variables
112
113 01/25/2025 04:33 PM 3,663,941 MS3-RC-Workout-f95.pdf #3
114 Subroutine MinStepSolver() #3L21+ -Min-Steps Lookup tables generator
115 ...opens & writes many files
116 Subroutine BitLog() #3L548+ -Results Novelty tracker
117 Subroutine ReadYourNml() #3L639+ -called by MS1Launch at the outset.
118 -opens 'MS4.ini' & EnvNml
119 Subroutine ImportEin() #3L713+ -internalizes .nml data
120 -branches to apps via %iType
121 Subroutine PrintErec() #3L774+ -view Emulator setup records
122 the core of Zone(s) setup/use
123 and runtime inputs
124 Subroutine PrintSRrec() #3L871+ -view Sequence/Result records
125 the core of Lookup table gen

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125
126
127 01/23/2025 06:19 PM 1,296,571 MS4-RC-Emulator-f95.pdf #4
128 -array-based Emulator
129 Subroutine EmulatorRC() #4L12+ -uses Data-Emulator.txt
130 Recursive Function Indexer()#4L116+ -uses Data-Indexer.txt
131
132 01/23/2025 06:19 PM 1,184,881 MS5-RC-ConCat-f95.pdf #5
133 Subroutine Concatenate() #5L14+ -uses Data-nLAV.txt
134 -uses Data-AttConcat.txt
135 Subroutine AllMoves() #5L106+ -concatenation-based Emulator
136 Subroutine ComputeOrder() #5L260+ -order(s) of Zone subsets
137
138 01/25/2025 04:31 PM 2,754,138 MS6-RC-Solve-f95.pdf #6
139 Subroutine GenScramble() #6L15+ -uses Data-Emulator.txt
140 Subroutine SolveScramble() #6L98+ -exercises Zones, solves 2x2x2's
141 -uses Data-Emulator.txt
142 Subroutine AtoD() #6L422+ -uses Discord.bim files
143
144 This is a 10 page visual aid for identifying the attitudes of a 2x2x2 scramble.
145 01/27/2025 06:23 PM 3,052,454 ScrambleID-2x2x2.pdf #7
146
147 Images:
148 01/02/2025 06:52 PM 326,033 Attitudes-3D.jpg
149 01/27/2025 08:37 PM 848,662 EveryVote-Corners.jpg
150 01/27/2025 08:36 PM 862,273 EveryVote-Edges.jpg
151 12/18/2024 09:28 PM 680,544 RC+faces.jpg
152 12/18/2024 09:28 PM 754,485 RC-Faces.jpg
153 13 File(s) 19,108,551 bytes
154 -----
155 Total Files Listed:
156 53 File(s) 452,347,839 bytes

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