CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J1303

Project Title
Which Algorithm Is the Most Efficient in Solving Alexander's Star?

Abstract

Objectives/Goals
To identify the most efficient algorithm in terms of time and number of moves (rotations of 72 degrees upon the puzzle's twelve axes of rotation) required to solve the twisty puzzle Alexander's Star (the ultimate configuration). This could ultimately be applied to handle configurations of software and data on computers.

Methods/Materials
Alexander's Star is manually subjected to two algorithms Optimal solution and God's Algorithm, with one trial for each algorithm consisting of 15 tests each. The puzzle's configuration is randomized before each test (in order to avoid the repitision of results).
Materials: written algoriths; stop watch; alexander's star puzzle; data log to record results.

Results
OPTIMAL (TRIAL 2) RAW DATA 1/18/2008
mental reasoning(control) 3 48.18 67
time moves
mean 4 08.89733333333333333 71.93333333
median 4 29.82 71
mode none 69
range 54.66 22
SUBJECTION OF ALEXANDER'S STAR TO GOD'S ALGORITHM RAW DATA
mental reasoning(control) 3 48.18 67
time moves
MEAN 3 26.096 55
MEDIAN 3 34.91 54
MODE NONE 57
RANGE 1 05.28 29

Conclusions/Discussion
Generally all of the ultimate configurations generated by God#s algorithm were the most efficient in terms of times to moves and the applicability. Then the traditional logical reasoning method (the control)and finally the optimal solution was the least efficient in terms of moves to time and was a bit more challenging or cumbersome to apply (hence generating ultimate configurations in a greater allotment of time) and generally the most frivolous. In short my hypothesis was supported through all examinations of

Summary Statement
To ultimately find the most efficient algorithm in terms of times and moves to solve the Rubik's puzzle Alexander's Star.

Help Received
For the generation, production, finalization, and construction of my display I have an immense number of people to thank many directly and indirectly. For the idea of my science fair project there is an immense number of people who I do no know or may never know who dedicated their time and effort writing