Universiti Teknologi MARA

2-Dimension Rubik's Cube Game

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Abstract

Rubik's Cube, invented in the late 1970s by Erno Rubik of Hungary, is the most famous combinatorial puzzle of its time. The standard version of this puzzle is a 3x3x3 cube with different colors on each of the exposed squares of the subcubes or cubies. Every 3x3x1 plane of the cube can be rotated or twisted 90, 180 or 270 degrees relative to the rest of the cube. This will give a lot of advantages to the player that play this famous puzzle and solve it with optimal solution. The goal of this puzzle is to make sure that all the squares on each side of the cube are of the same color. To achieve this goal, the player needs to have a strategy. The beginner player needs to learn this strategy step by step and they need to understand why they need to do the step. The first problem that the beginner will face is, they are not able to see the whole cube. Human being only can see 50% of the cube in one time. The beginner player always make mistake in movement that will affect the other color that already complete or in other hand, the color in the right place. This happened because they have the first problem. This is why the researcher tries to develop 2Dimension rubik cube game. This game will present rubik's cube in 2D, this will help beginner to solve their first problem. To make movement, the player needs to click the button. This game has 18 movement buttons. The button are Right1, Right2, Right3,Left1, Left2, Left3,Up1, Up2, Up3,Down1, Down2, Down3, Right4, Right5, Right6,Left4, Left5 and Left6. To save all the face, the researcher used 2D array to save all the color one by one. So this game needs 6 2D arrays because the rubik's cube has 6 faces. To help beginner, this game have automatic solution to solve scramble rubik's cube. While solve the scramble rubik's cube, this game will save the entire step that the algorithm do. The researcher uses his own algorithm to create automatic solution function. The algorithm come from a strategy that usually used by researcher to solve the scramble rubic's cube. This strategy has intersection of steps with the "unlock the secret" strategy by Tyson mao, jasmine lee and garris in 2008. There have some step that same with that strategy and some step are not. This research concentrates to the beginners that want to learn how to solve rubik's cube. That why, speed and total of step are not important in this game. This game only concern about achieving the goal of rubik's cube.

CHAPTER 1

INTRODUCTION

1.0   Introduction

This chapter provides the overview of the research and discussion of research background, problem statement, research purpose, objective, scope, significance of study about the Rubik's cube game.

1.1   Research background

Rubik's Cube, invented in the late 1970s by Erno Rubik of Hungary, is the most famous combinatorial puzzle of its time (Korf, 1997). Richard also says that the standard version of this puzzle is 3x3x3 cube with difference colors on each of the expose squares of the subcubes or cubies. According to Korf, every 3x3x1 plane of the cube can be rotated or twisted 90, 180 or 270 degrees relative to the rest of the cube. This will give a lot of advantages to the player that play this famous puzzle and solve it with optimal solution. The goal of this puzzle is to make sure that all the squares on the each side of the cube are the same color (Korf, 1997). This puzzle usually will be scrambled by making a number of the random twists, and the player need to solve the cube to its original goal state (Korf, 1997).