

TECHNICAL REPORT
AN INTERFACE OF MAGIC SQUARE
IN MATHEMATICS
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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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ABSTRACT

The magic square is a branch of mathematical recreation using combination theory. It provides entertainment and interesting research for generating mathematical knowledge. Magic square also has been used in Karnaugh map and contributes in geometrical analysis and in number theory. There are many patterns of magic squares such as 3×3 , 4×4 , 5×5 and higher. This research focuses on magic square of order four. This research investigates the operations and properties of magic square of order four such as complement, rotation and reflection. The method that has been used in solving the magic square of order four is Devedec's method. This method focuses on double-even order. The magic square of order four has solutions obtained by considering the possible numbers for every diagonal, column and row in magic square. In this research, the solutions for magic square of order four are generated using Matlab software instead of by manual calculation. Moreover, a graphical user interface of magic square of order four has been developed using Matlab in order to generate the error-free solutions of magic square. The solutions generated are error-free as the numbers used are within the limit corresponding to the order and without repetitions of digits.

1. INTRODUCTION

The aim of this section is to discuss the origin and properties of magic squares of order four. Thus, the chapter begins with an introductory background which includes the history of magic square. The problem statement and objectives of the research will be briefly discussed followed by the signification of study and the scope of this research.

1.1 Background Research

In the mathematical field, there is an interesting outlet to create mathematical knowledge of arrangement of number called magic number arrangement. The most common array in magic number arrangement is known as magic square. Definition a magic square is a $n \times n$ matrix where the sum of the numbers in every column, row and diagonal always have the same number known as magic constant. According to Benjamin and Brown (2013), the magic squares are not only for mathematicians but for entertainment.

The $n \times n$ for magic squares, (see figure 1.1) is very interesting because so many entries have the same magic total.

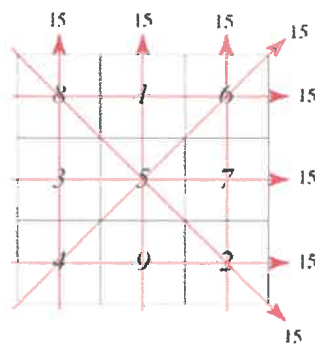


Figure 1.1: The magic square