

Fun with Birthdates

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| **22** | **12** | **18** | **87** |
| **88** | **17** | **09** | **25** |
| **10** | **24** | **89** | **16** |
| **19** | **86** | **23** | **11** |

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Srinivasa Ramanujan was undoubtedly one of the greatest Mathematicians this world ever witnessed. Though he passed away at a very young age, the genius has left behind with the world among several innovations a fun mathematical game.

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Ramanujan’s Magic Square is an interesting mathematical square where in Ramanujan arranged his birthday (22nd December 1887) in the alongside form. At a glance, there seems to be nothing peculiar about it. But giving it a deep observation, you would observe that every column, row, diagonal, the 4 corners, and the adjacent 2 by 2 squares sum to 139 which are marked in the same colour with the exception of the alongside light blue and dark blue coloured squares.

What the great Mathematician missed; I have overcome. If ‘dd/mm/ccyy’ is the date, then my superior algorithm to obtain super magic square is given below.

|  |  |  |  |
| --- | --- | --- | --- |
| *dd* | *mm* | *cc* | *yy* |
| *aa* | *cc + yy - aa* | *-mm - yy + aa + 2 \* bb* | *dd + 2 \* mm + yy - aa - 2 \* bb* |
|  |  |  |  |
| *mm + cc + yy - aa - bb* | *-mm + aa + bb* | *dd + mm + yy - aa - bb* | *-yy + aa + bb* |

Using this algorithm, you can obtain a ***Ramanujan Lakshmana Super Magic Square*** for any birthdate. An example of the date 7th December 2019 is given below:

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| **07** | **12** | **20** | **19** |
| **14** | **25** | **01** | **18** |
| **09** | **10** | **22** | **17** |
| **28** | **11** | **15** | **04** |

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| **07** | **12** | **20** | **19** |
| **14** | **25** | **01** | **18** |
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| **14** | **25** | **01** | **18** |
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Here all columns, rows, diagonals, the 4 corners, adjacent squares sum to 58. You can notice even the light blue and dark blue coloured cells also sum to 58. This square is a super magic square.

But for a super magic square, it is necessary to have ***yy < 63,*** and ***dd + mm + cc + yy*** must be an ***even number***. Otherwise, it would be a normal magic square similar to Ramanujan’s as shown given below.

|  |  |  |  |
| --- | --- | --- | --- |
| *dd* | *mm* | *cc* | *yy* |
| *aa* | *cc + yy - aa* | *-mm - yy + aa + 2 \* bb* | *dd + 2 \* mm + yy - aa - 2 \* bb* |
| *bb* | *dd + mm - bb* | *mm + yy - bb* | *-mm + cc + bb* |
| *mm + cc + yy - aa - bb* | *-mm + aa + bb* | *dd + mm + yy - aa - bb* | *-yy + aa + bb* |

I have hosted an interactive application at <https://lksmangai.github.io/AngularBirthDate> where you can find magic square of anyone’s birth date.

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