MAGIC SQUARE: HIT AND TRIAL 03

So in last video we saw the conditions which we can follow to find our magic square of any size n, precisely n should be odd. Let me help you with an example to solve, to use these steps to find the magic square of size for us three cross three matrix. Now here i have a three, i created a three cross three matrix here x represents the elements which i will write as i will follow the algorithm and these are the locations of these elements. For example the matrix starts with zero comma zero which is the location of this element is zero comma zero because this is the first row which is zero is been told you the always the first row and first column will be zero comma zero please follow this convention, location of this element is zero comma one, location of this element is zero comma two similarly location of this element is one comma zero because this is the first row location of this element is one comma one, location of this element in one comma two, location of this element is two comma zero, location of this element is two comma one and location of this element is two comma two. Now let me go to the condition the first step was to find the location of one we know that one is already always located at the middle row and last column so we find that. See in this example the size of the value of n is three because this is the three comma three matrix and we want to create the magic square of size three cross three. So yeah so let's see the first step which is determining the position of one, since n is three so the location of one is n by two comma n minus one which is three by two comma three minus one, three by two becomes one integer division and three minus one becomes two. So position of one is one comma two, so i will put one here awesome, now the next step is to determine the position of two, so for that what we have to do, will take the last determined location, last determined location is one comma two is p comma q which becomes p this becomes q and will find the next position, position of next element as p minus one comma q plus one so position of two becomes p minus one which is one minus one and q plus one which is two plus one so it becomes zero comma three ok. Now any time, any time is calculated column positions columns position becomes n see here the column position is becoming n, n is three. So make it zero so i will make it, making it zero it becomes zero comma zero. So i will put two at zero comma zero, two i will put, i will put zero comma zero ok great so now the next element is three i have to determine the position of three so i will take last calculated position p comma q this is p this is q and again i will follow the same thing. So the position of three becomes p minus one and q plus one, p minus one is zero minus one and q plus one is zero plus one it becomes, what does it become? You should write it here, it becomes minus one comma one again i will say the same thing any time the calculated row position becomes minus one here row position becomes minus one make it n minus one so n minus one means three minus one, so three minus one is two this is as it is two comma one so my position of three is two comma one, let me see where is two comma one, two comma one is here so here i will write three great again position of four same algorithm two one as pq two minus one is one, one plus one is two this i simple one comma two, one comma two i will now see at one comma two one is already present so what we have to do? If the calculated position already contains the number then decrement the column by two and increment the row by one so what i will do, decrement the

column, column position was two determine position was two, so decrement the column position by two which becomes two minus two is zero and increment the row by one, one plus one becomes two at two comma zero i will put four great, position of five becomes this is pq two minus one, zero comma one so one comma one i will put five here, position of six one minus one, one plus one two zero comma two so i write zero comma two is six, position of seven becomes what is zero minus one into plus one, now this is little bit tricky. See whenever we saw here see here that zero minus one is becoming minus one will see this condition that any time if calculated row position become minus one then make it n minus one we have to check here both the condition is if position of row become is becoming minus one and the column is becoming n which is three here then you have to follow this condition that is the fourth one, if anytime row position is becoming minus one and, and is very important here column becomes n which is to zero comma n minus two so i will make it to zero comma n minus two three minus two is one so zero comma, at zero comma one i will put seven ok. now next is eight, eight is that so zero comma one is my pq so zero minus one and one plus one so it becomes minus one and two so i will use this condition only that is row is becoming minus one and i will make it n minus one, n minus one is three minus one which is two so it becomes two comma two, so two comma two i will put, eight and the last is nine so which two comma two is my pq so two minus one becomes one and two plus one becomes three so two minus one i don't have any problem with this the row, the column is becoming three so i will wrap it up so it becomes three becomes zero becomes one comma zero so i will get one comma zero. As you see this was the exactly these were the elements of magic square, you can see here i got the magic square you can find the diagonal some of diagonal and row and column it is exactly fifty nine, eight plus one plus six is fifteen, nine plus one plus five is fifteen. So this is the algorithm we are going to use pretty simple. Giving me this algorithm i can definitely say that you can write a programme, you can use the steps and i will encourage you guys to write a programme by your own and you can ask any question in discussion form, in the next video i will try to code this, write a programme using this algorithm and we will create magic square of this size. If you think you can find another pattern and you can write so another algorithm please please please post it on discussion form, it will be very good for us and for other students also. Thank you.