'''This is a project made by the students of Lovely Professional University: Arshdeep Singh , T Vegitha ,

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Aim of the Project is to make a basket and arrange the eggs in it in such a way that the sum of each

row, column and diagonal are equal.

We used some of the in built functions and logics to built this code.'''

def forEvenNumber(n):              # x = column and y = row

    arr = [[(n \* y) + x + 1 for x in range(n)] for y in range(n)]

    # Setting the ranges to rows and columns

    for i in range(0, n // 4):

        for j in range(0, n // 4):

            arr[i][j] = (n \* n + 1) - arr[i][j];

    for i in range(0, n // 4):

        for j in range(3 \* (n // 4), n):

            arr[i][j] = (n \* n + 1) - arr[i][j];

    for i in range(3 \* (n // 4), n):

        for j in range(0, n // 4):

            arr[i][j] = (n \* n + 1) - arr[i][j];

    for i in range(3 \* (n // 4), n):

        for j in range(3 \* (n // 4), n):

            arr[i][j] = (n \* n + 1) - arr[i][j];

    for i in range(n // 4, 3 \* (n // 4)):

        for j in range(n // 4, 3 \* (n // 4)):

            arr[i][j] = (n \* n + 1) - arr[i][j];

    print("\nSum of all row, column and diagonals = ",

          n \* (n \* n + 1) // 2, "\n")

    for i in range(n):

        for j in range(n):

            print('%2d ' % (arr[i][j]), end=" ")

        print()

def forOddNumber(n):

    mgsqr = [[0 for x in range(n)]            # x = column and y = row

             for y in range(n)]

    # Applying the first condition to check that n is Even or Odd or "0"

    # If "n" is an odd integer

    r = n // 2

    c = n - 1

    num = 1

    while num <= (n \* n):

        if r == -1 and c == n:    # Condition if both the rows and columns are out of range

            c = n - 2

            r = 0

        else:

            if c == n:            # Condition if columns are out of range

                c = 0

            if r < 0:             # Condition if rows are out of range

                r = n - 1

        if mgsqr[int(r)][int(c)]:  # Starting to arrange

            c = c - 2

            r = r + 1

            continue

        else:                             # Condition if the before condition becomes False

            mgsqr[int(r)][int(c)] = num

            num = num + 1

        c = c + 1

        r = r - 1

    print("\nSum of all row, column and diagonals = ",

          n \* (n \* n + 1) // 2, "\n")

    for i in range(0, n):

        for j in range(0, n):

            print('%2d ' % (mgsqr[i][j]), end='')

        print()

print("\nWELCOME:)\n")

n = int(input("Please Enter the Number of Rows and Column (n\*n): "))

if n%2==0:

    forEvenNumber(n)

else:

    forOddNumber(n)

print("\nThank You :)")