**Test Cases:**

**1. Get Input Pass**

Get the input from the Input.txt file and convert the comma separated values into a matrix format.

**2. Square Matrix Pass**

Next, we check if the matrix is a square matrix or not by comparing length ofrows and columns and if equal we then move to the next step.

**3. Calculate Determinant Pass**

If the matrix taken as input is a square matrix, we calculate the determinant.

**4. Singular Non-Singular Pass**

If the determinant = 0 then that given Matrix is a Singular Matrix.

If determinant = 0 then That Matrix is a Non-Singular Matrix.

**Unit Test Cases:**

**unittest.TestCase()**

**testSetup()**

**testInput()**

InputFile = []

*with* open('G:\\Gareth\\SICSR\\Sem2\\CM\\Assignment 1\\Input.txt', 'r') *as* f:

    InputFile = [[int(num) *for* num *in* line.split(',')] *for* line *in* f]

**testSquareMatrix()**

def Cofactor(Matrix, i, j):

*return* [row[: j] + row[j+1:]

*for* row *in* (Matrix[: i] + Matrix[i+1:])]

**testDeterminant()**

    Determinant = 0

*for* i *in* range(n):

        S = (-1)\*\*i

        SDeterminant = NonSingular(Cofactor(Matrix, 0, i))

        Determinant += (S\*Matrix[0][i]\*SDeterminant)

*return* Determinant

**testNonSingular()**

def NonSingular(Matrix):

    n = len(Matrix)

*if* (n == 2):

        Value = Matrix[0][0]\*Matrix[1][1] - Matrix[1][0]\*Matrix[0][1]

*return* Value

**tearDown()**

Matrix = InputFile

n = len(Matrix)

print("\nOriginal Matrix is: ")

*for* i *in* range(n):

*for* j *in* range(n):

        print(Matrix[i][j], end=' ')

    print()

*if*(NonSingular(Matrix)):

    print("\nThe Above Matrix is Non-Singular.")

*else*:

    print("\nThe Above Matrix is Singular\n")