```python
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# Submission Date ----- September 11, 2019
# Language Used ------- Python 3
# Program Description - This program implements the 3 basic
# -------------------- transformations:
# -------------------- translation, scaling, rotation.
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#-------------------------------------------------------------
# imports
#-------------------------------------------------------------
import math


#-------------------------------------------------------------
# Function Definitions
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# Matrix Multiplication --------------------------------------
# A is 3 by 3
# B is 3 by 1
def MatrixMult(A, B):
    if len(A) != 3:
        print("Wrong dimension for transformation matrix")
    elif len(B) != 3:
        print("Wrong dimension for coordinate matrix")
    else:
        result = [0 for i in range(3)]
        for i in range(3):
            for j in range(3):
                result[i] += A[i][j]*B[j]
        return result


# Translation ------------------------------------------------
def translate(B):
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    # B is the original coordinates
    B.append(1)

    # populate identity matrix
    I = [[0 for i in range(3)] for j in range(3)]
    I[0][0], I[1][1], I[2][2] = 1,1,1

    # ask user for translate parameters (e,f)
    I[0][2] = int(input("Translation factor for x: "))
    I[1][2] = int(input("Translation factor for y: "))

    # matrix multiplicaiton
    result = MatrixMult(I, B)
    return round(result[0],2), round(result[1],2)



# Scaling ----------------------------------------------------------
def scale(B):
    # B is the original coordinates
    B.append(1)

    # populate scaling matrix & ask user for scaling factors (a,b)
    I = [[0 for i in range(3)] for j in range(3)]
    I[2][2] = 1
    I[0][0] = int(input("Scaling factor for x: "))
    I[1][1] = int(input("Scaling factor for y: "))

    # matrix multiplication
    result = MatrixMult(I, B)
    return round(result[0],2), round(result[1],2)



# Rotation ----------------------------------------------------------
def rotate(B):
    # B is the original coordinates
    B.append(1)

    # ask user for rotation angle r
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    R = input("Rotation angle in degrees (r): ").split()
    R = [int(i) for i in R]
    r = R[0] * math.pi / 180

    # populate scaling matrix
    I = [[0 for i in range(3)] for j in range(3)]
    I[0][0], I[1][1] = math.cos(r), math.cos(r)
    I[0][1], I[1][0] = -math.sin(r), math.sin(r)

    # matrix multiplication
    result = MatrixMult(I, B)
    return round(result[0],2), round(result[1],2)


#----------------------------------------------------------------
# Main Function
#----------------------------------------------------------------
def main():
    x = int(input("x coordinate: "))
    y = int(input("y coordinate: "))
    Coor = [x,y]
    user = input("Choose transformation: \nEnter T for translation, S
 for scaling, R for rotation: ").strip().upper()[0]
    if user == "T":
        print("New point at:", translate(Coor))
    elif user == "S":
        print("New point at:", scale(Coor))
    elif user == "R":
        print("New point at:", rotate(Coor))
    else:
        print("Invalid Input.")

if __name__ == "__main__":
    main()
```