Rotation 2D

```
#include stdio.h
#include math.h
 Function to rotate a point (x,y) around the origin (0,0) by angle theta (in radians)
void rotatePoint(float x, float y, float theta) {
   float x_new = (x)  cos(theta) - (y)  sin(theta);
   float y_new = (x)  sin(theta) + (y)  cos(theta);
    x = x_new;
   y = y_new;
}
int main() {
   float x, y, angle_degrees;
     Get input from user
   printf(Enter the x-coordinate );
   scanf(%f, &x);
      printf(Enter the y-coordinate );
   scanf(%f, &y);
      printf(Enter rotation angle in degrees );
   scanf(%f, &angle_degrees);
       Convert degrees to radians
   float angle_radians = angle_degrees  M_PI  180.0;
       Print original coordinates
   printf(nOriginal Coordinates (%.2f, %.2f)n, x, y);
       Rotate the point
   rotatePoint(&x, &y, angle_radians);
       Print rotated coordinates
   printf(Rotated Coordinates (%.2f, %.2f)n, x, y);
      return 0;
}
```

Scaling 2D

```
#include <stdio.h>
// Function to scale a point (x,y) around the origin (0,0) by scale factors sx and sy
void scalePoint(float *x, float *y, float sx, float sy) {
    *x = (*x) * sx;
    *y = (*y) * sy;
}
int main() {
    float x, y, scale_x, scale_y;
    // Get input from user
    printf("Enter the x-coordinate: ");
    scanf("%f", &x);
    printf("Enter the y-coordinate: ");
    scanf("%f", &y);
    printf("Enter scale factor for x: ");
    scanf("%f", &scale_x);
    printf("Enter scale factor for y: ");
    scanf("%f", &scale_y);
        // Print original coordinates
    printf("\nOriginal Coordinates: (%.2f, %.2f)\n", x, y);
        // Scale the point
    scalePoint(&x, &y, scale_x, scale_y);
        // Print scaled coordinates
    printf("Scaled Coordinates: (%.2f, %.2f)\n", x, y);
        return 0;
}
```