```
#include <iostream>
#include <graphics.h>
#include <math.h>

using namespace std;

class Transformation {
public:
   int x1, x2, y1, y2;
   void accept() {
      cout << "Enter coordinate x1 : ";
      cin >> x1;

      cout << "Enter coordinate y1 : ";
      cin >> y1;

      cout << "Enter coordinate x2 : ";
      cin >> x2;

      cout << "Enter coordinate y2 : ";
      cin >> y2;

      line(x1, y1, x2, y2);
   }

   void translate(){
   int tx, ty;
   cout << "Enter coordinate for point x : ";
   cin >> tx;
   cout << "Enter coordinate for point y : ";
   cin >> ty;

   line(x1+tx, y1+ty, x2+tx, y2+ty);
   }

   void scaling(){
   int sx, sy;
   cout << "Enter coordinate for point x : ";
   cin >> sx;
   cout << "Enter coordinate for point y : ";
   cin >> sy;

   line(x1*sx, y1*sy, x2*sx, y2*sy);
   }

   void rotation() {
   int Rx1, Ry1, Rx2, Ry2;
   double s, c, angle;
```

```
    cout << "Enter the angle to rotate the line : ";
    cin >> angle;

    // Convert the angle from degrees to radians
    c = cos(angle * 3.14 / 180);
    s = sin(angle * 3.14 / 180);

    // Find the midpoint of the line
    int mx = (x1 + x2) / 2;
    int my = (y1 + y2) / 2;

    // Translate the line to the origin (midpoint)
    int tx1 = x1 - mx;
    int ty1 = y1 - my;
    int tx2 = x2 - mx;
    int ty2 = y2 - my;

    // Apply the rotation matrix
    Rx1 = floor(tx1 * c - ty1 * s);
    Ry1 = floor(tx1 * s + ty1 * c);
    Rx2 = floor(tx2 * c - ty2 * s);
    Ry2 = floor(tx2 * s + ty2 * c);

    // Translate back to the original position
    Rx1 += mx;
    Ry1 += my;
    Rx2 += mx;
    Ry2 += my;

    // Draw the rotated line
    line(Rx1, Ry1, Rx2, Ry2);
}

};

int main() {
    int gd = DETECT, gm;
    initgraph(&gd, &gm, " ");

    Transformation t;
    int ch;
    char q;

    t.accept();
    do {
        cout << "Menu : ";
        cout << "\n1. Translate";
```

```
        cout << "\n2. Scale";
        cout << "\n3. Rotate";
        cout << "\n4. Exit"<<endl;
        cout << "Enter your choice : ";

        cin >> ch;

    switch(ch){
    case 1 :
        t.translate();
        break;
    case 2 :
        t.scaling();
        break;
    case 3 :
        t.rotation();
        break;
    case 4 :
        exit(0);

    default :
        cout << "Invalid choice...";
        break;
        }

        cout << "Do you want to continue? (y/n): ";
        cin >> q;
    } while(q == 'y' || q == 'Y');

    getch();
    closegraph();
    return 0;
}
```