CODE:

```
#include <iostream>
#include <graphics.h>
#include <math.h>
using namespace std;
class Transform {
public:
   int m, a[20][20], c[20][20];
   void accept() {
      cout << "\nEnter the Number Of Edges: ";
      cin >> m;
      cout << "\nEnter The Coordinates: ";
      for (int i = 0; i < m; i++) {
         for (int j = 0; j < 3; j++) {
            if (j >= 2)
               a[i][j] = 1;
            else
               cin >> a[i][j];
         }
      }
   }
   void object() {
```

```
    int gd, gm;
    gd = DETECT;
    initgraph(&gd, &gm, NULL);
    line(300.0, 0.0, 300.0, 600.0);
    line(0, 300, 600, 300);
    for (int i = 0; i < m - 1; i++) {
        line(300 + a[i][0], 300 - a[i][1], 300 + a[i + 1][0], 300 - a[i + 1][1]);
    }
    line(300 + a[0][0], 300 - a[0][1], 300 + a[m - 1][0], 300 - a[m - 1][1]);

    for (int i = 0; i < m - 1; i++) {
        line(300 + c[i][0], 300 - c[i][1], 300 + c[i + 1][0], 300 - c[i + 1][1]);
    }
    line(300 + c[0][0], 300 - c[0][1], 300 + c[m - 1][0], 300 - c[m - 1][1]);
    cout << "Press 1 to continue";
    int temp;
    cin >> temp;
    closegraph();
}
void multiply(float b[20][20]) {
    for (int i = 0; i < m; i++) {
        for (int j = 0; j < m; j++) {
```

```
            c[i][j] = 0;
            for (int k = 0; k < m; k++) {
                c[i][j] += (a[i][k] * b[k][j]);
            }
        }
    }
}
void translate(float tx, float ty) {
    float b[20][20] = {
        {1, 0, 0},
        {0, 1, 0},
        {tx, ty, 1}
    };
    multiply(b);
    object();
}
void scale(float sx, float sy) {
    float b[20][20] = {
        {sx, 0, 0},
        {0, sy, 0},
        {0, 0, 1}
    };
```

```
        multiply(b);
        object();
    }
    void rotate(float deg) {
        float theta = deg * (3.14 / 180);
        float b[20][20] = {
            {cos(theta), sin(theta), 0},
            {sin(-theta), cos(theta), 0},
            {0, 0, 1}
        };
        multiply(b);
        object();
    }
};
int main() {
    Transform t;
    t.accept();
    int ch;
    cout << "\nEnter your choice"
         << "\n1. Translation"
         << "\n2. Scaling"
         << "\n3. Rotation: ";
```

```
    cin >> ch;
    float tx, ty, sx, sy;
    float deg;

    if (ch == 1) {
        cout << "\nTRANSLATION OPERATION\nEnter value for tx and ty: ";
        cin >> tx >> ty;
        t.translate(tx, ty);
    } else if (ch == 2) {
        cout << "\nSCALING OPERATION\nEnter value for sx, sy: ";
        cin >> sx >> sy;
        t.scale(sx, sy);
    } else if (ch == 3) {
        cout << "\nROTATION OPERATION\nEnter value for angle: ";
        cin >> deg;
        t.rotate(deg);
    } else {
        cout << "\nInvalid choice";
    }
    getch();
    return 0;
}
```

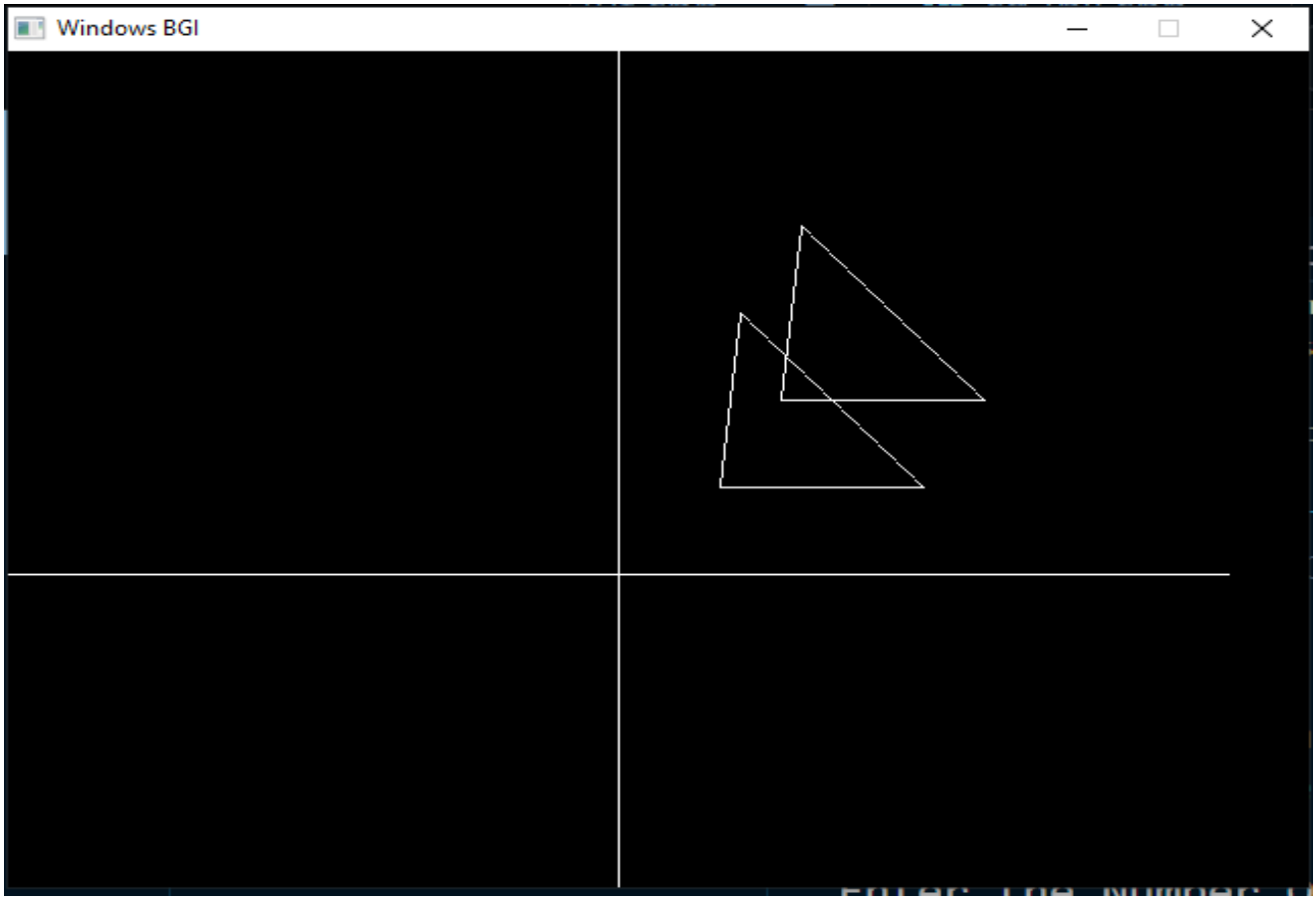
USER INPUT:

```
Enter the Number Of Edges: 3

Enter The Coordinates: 50 50 150 50 60 150

Enter your choice
1. Translation
2. Scaling
3. Rotation: 1
TRANSLATION OPERATION
Enter value for tx and ty: 30 50
```

OUTPUT:



USER INPUT:

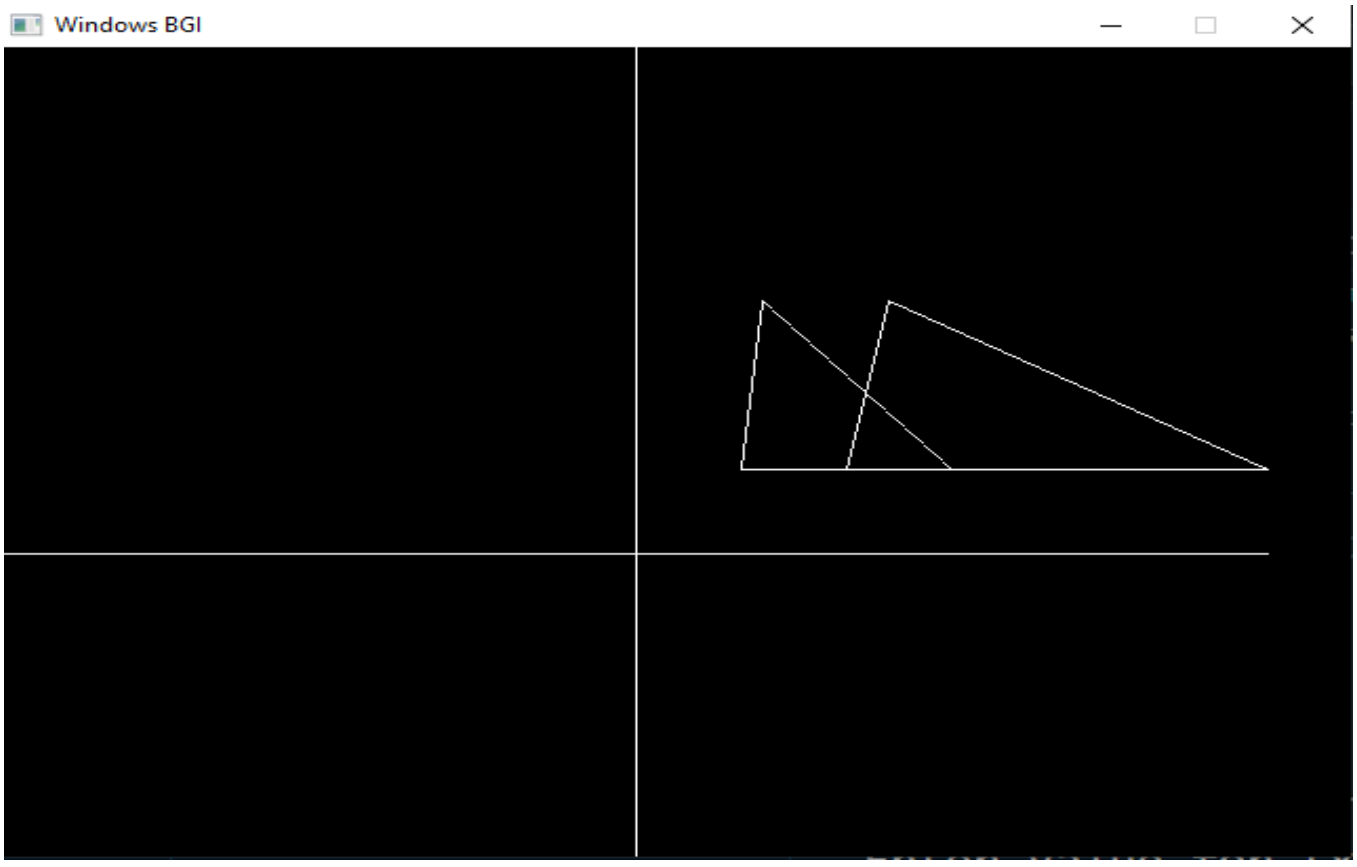
```
Enter the Number Of Edges: 3

Enter The Coordinates: 50 50 150 50 60 150

Enter your choice
1. Translation
2. Scaling
3. Rotation: 2

SCALING OPERATION
Enter value for sx, sy: 2 1
```

OUTPUT:



USER INPUT:

```
Enter the Number Of Edges: 3

Enter The Coordinates: 50 50 150 50 60 150

Enter your choice
1. Translation
2. Scaling
3. Rotation: 3

ROTATION OPERATION
Enter value for angle: 30
```

OUTPUT: