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Batch: T5

Experiment 6: Implementation of 3D transformation

3D Translation:

```
#include<stdio.h>
#include<stdlib.h>
#include<math.h>
#include<graphics.h>
using namespace std;
int maxx,maxy,midx,midy;

void axis()
{
        getch();
        line(midx,0,midx,maxy);
        line(0,midy,maxx,midy);
}
int main()
{
        int gd = DETECT, gm;
        detectgraph(&gd, &gm);
        initgraph(&gd, &gm, "c:\\turboc3\\bgi");
        int x, y,z,o, x1, y1, x2, y2;

        maxx=getmaxx();
        maxy=getmaxy();
```

```c
        midx=maxx/2;

        midy=maxy/2;


        outtextxy(midx+60,midy-20, "Before Translation");

        line(midx,0,midx,maxy);

        line(0,midy,maxx,midy);

    bar3d(midx+100,midy-40, midx+60, midy-90, 20,5);

    axis();

    outtextxy(midx+100,20,"After Translation");

    printf("/nEnter translation factor");

    scanf("%d%d",&x,&y);

    bar3d(midx+100,midy-40, midx+60, midy-90, 20,5);

    bar3d(midx+(x+100), midy-(y+40), midx+(x+60), midy-(y+90), 20, 5);

    axis();


    closegraph();

    return 0;

}
```
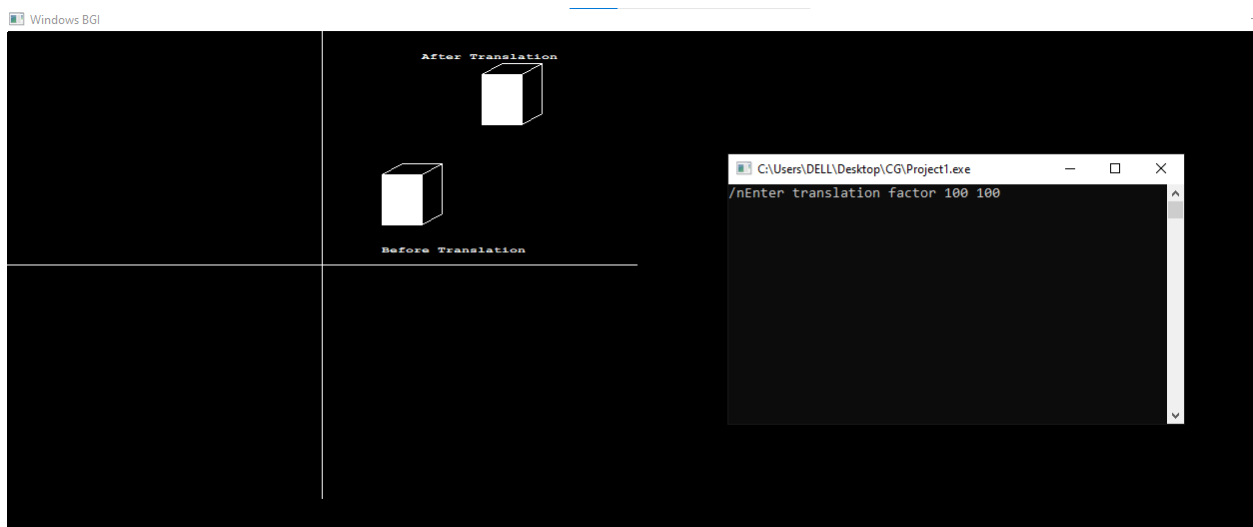
OUTPUT:

3D Scaling:

```c
#include<stdio.h>
#include<stdlib.h>
#include<math.h>
#include<graphics.h>
using namespace std;
int maxx,maxy,midx,midy;




void axis()
{
        getch();
        line(midx,0,midx,maxy);
        line(0,midy,maxx,midy);
}


int main()
{
        int gd = DETECT, gm;
        detectgraph(&gd, &gm);
        initgraph(&gd, &gm, "c:\\turboc3\\bgi");
        int x, y,z,o, x1, y1, x2, y2;


        maxx=getmaxx();
        maxy=getmaxy();
        midx=maxx/2;
        midy=maxy/2;


        outtextxy(midx+60,midy-20, "Before Scaling");
```

```c
        line(midx,0,midx,maxy);

        line(0,midy,maxx,midy);

    bar3d(midx+100,midy-40, midx+60, midy-90, 20,5);

    axis();

    outtextxy(midx+100,20,"After Scaling");

    printf("/nEnter Scaling factor");

    scanf("%d%d%d",&x,&y, &z);




    setcolor(YELLOW);

    bar3d(midx+(x*100), midy-(y*40), midx+(x*60), midy-(y*90), 20, 5);

    axis();

    closegraph();

    return 0;

}
```
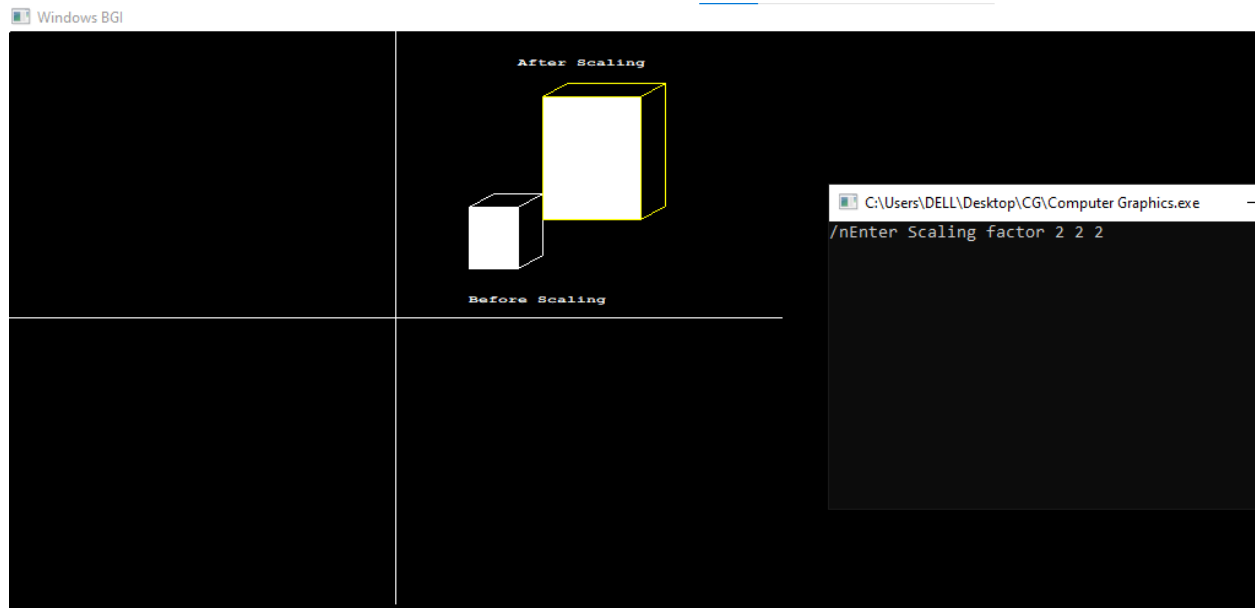
OUTPUT:

3D Rotation:

```c
#include<stdio.h>
#include<stdlib.h>
#include<math.h>
#include<graphics.h>
using namespace std;
int maxx,maxy,midx,midy;

void axis()
{
        getch();
        line(midx,0,midx,maxy);
        line(0,midy,maxx,midy);
}

int main()
{
        int gd = DETECT, gm;
        detectgraph(&gd, &gm);
        initgraph(&gd, &gm, "c:\\turboc3\\bgi");
        int x, y,z,ang, x1, y1, x2, y2;

        maxx=getmaxx();
        maxy=getmaxy();
        midx=maxx/2;
        midy=maxy/2;

        outtextxy(midx+60,midy-20, "Before Rotation");
        line(midx,0,midx,maxy);
        line(0,midy,maxx,midy);
```

```c
        bar3d(midx+100,midy-40, midx+60, midy-90, 20,5);


    printf("Enter the Rotation Angle: ");
    scanf("%d",&ang);



    x1=100*cos(ang*3.14/180)-40*sin(ang*3.14/180);
    y1=100*sin(ang*3.14/180)+40*sin(ang*3.14/180);
    x2=60*cos(ang*3.14/180)-90*sin(ang*3.14/180);
    y2=60*sin(ang*3.14/180)+90*sin(ang*3.14/180);
    axis();
      setcolor(YELLOW);
    printf("\n After rotating about x-axis\n");
    bar3d(midx+100,midy-40,midx+60,midy-90,20,5);
    bar3d(midx+100,midy-x1,midx+60,midy-x2,20,5);
    axis();


    printf("\n After rotating about z-axis\n");
    bar3d(midx+100,midy-40,midx+60,midy-90,20,5);
    bar3d(midx+x1,midy-y1,midx+x2,midy-y2,20,5);
    axis();


    printf("\n After rotating about y-axis\n");
    bar3d(midx+100,midy-40,midx+60,midy-90,20,5);
    bar3d(midx+x1,midy-40,midx+x2,midy-90,20,5);
    axis();
    closegraph();
}
```