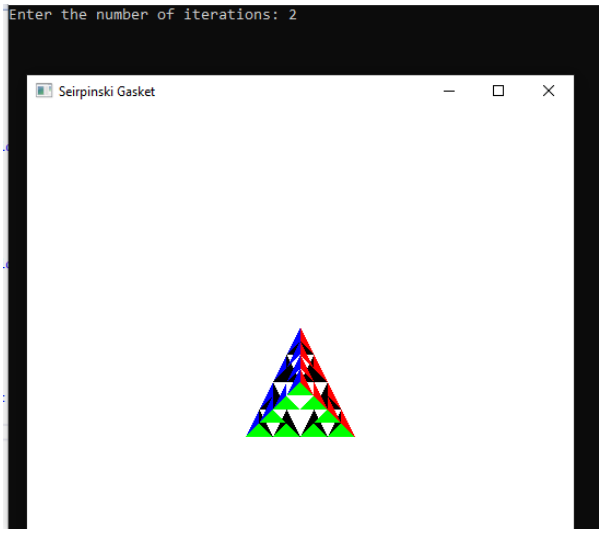
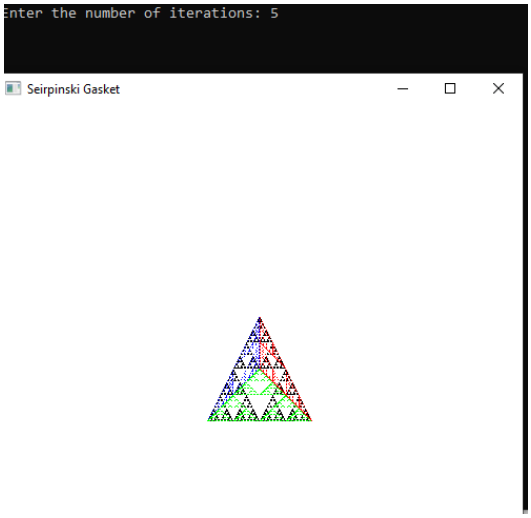
3. Write a program to recursively subdivides a tetrahedron to form 3D Sierpinski gasket. The number of recursive steps is to be specified at execution time.

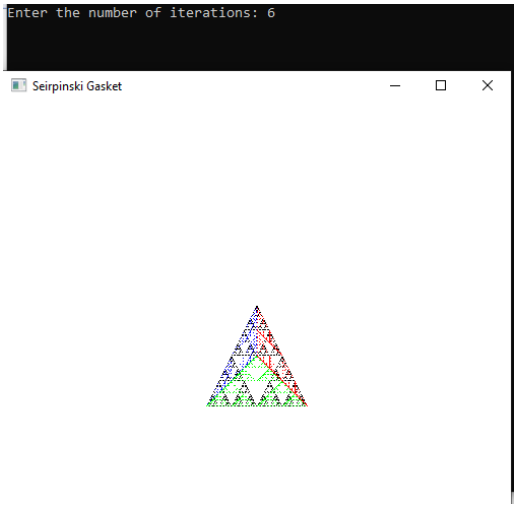
```
#include<gl/glut.h>
#include<stdio.h>

int m;
typedef float point[3];
point tetra[4] = { {0,100,-100},{0,0,100},{100,-100,-100},{-100,-100,-100} };
void tetrahedron(void);
void myinit(void);
void divide_triangle(point a, point b, point c, int m);
void draw_triangle(point p1, point p2, point p3);
int main(int argv, char** argc)
{
	//int m;
	printf("Enter the number of iterations: ");
	scanf_s("%d", &m);
	glutInit(&argv, argc);
	glutInitDisplayMode(GLUT_SINGLE | GLUT_RGB | GLUT_DEPTH);
	glutInitWindowPosition(100, 200);
	glutInitWindowSize(500, 500);
	glutCreateWindow("Seirpinski Gasket");
	glutDisplayFunc(tetrahedron);
	glEnable(GL_DEPTH_TEST);
	myinit();
	glutMainLoop();
}
void divide_triangle(point a, point b, point c, int m)
{
	point v1, v2, v3;
	int j;
	if (m > 0) {
		for (j = 0; j < 3; j++)
			v1[j] = (a[j] + b[j]) / 2;
		for (j = 0; j < 3; j++)
			v2[j] = (a[j] + c[j]) / 2;
		for (j = 0; j < 3; j++)
			v3[j] = (b[j] + c[j]) / 2;

		divide_triangle(a, v1, v2, m - 1);
		divide_triangle(c, v2, v3, m - 1);
		divide_triangle(b, v3, v1, m - 1);
	}
	else
		draw_triangle(a, b, c);
}
void myinit()
{
	glClearColor(1, 1, 1, 1);

	//glFlush();
	glOrtho(-500.0, 500.0, -500.0, 500.0, -500.0, 500.0);
	//gluOrtho(-500.0,500.0,-500.0,500.0,-500.0,500.0);
}
void tetrahedron(void)
```

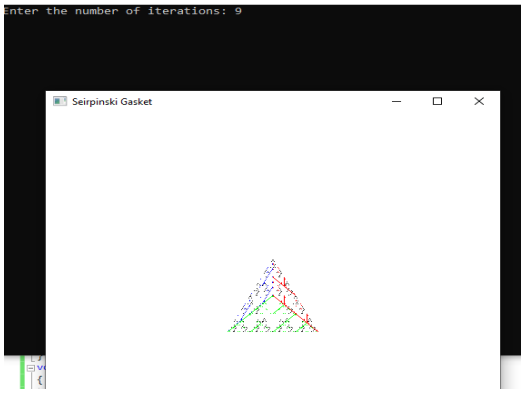
```
{
	//myinit();
	glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
	glColor3f(1.0, 0.0, 0.0);
	divide_triangle(tetra[0], tetra[1], tetra[2], m);
	glColor3f(0.0, 1.0, 0.0);
	divide_triangle(tetra[3], tetra[2], tetra[1], m);
	glColor3f(0.0, 0.0, 1.0);
	divide_triangle(tetra[0], tetra[3], tetra[1], m);
	glColor3f(0.0, 0.0, 0.0);
	divide_triangle(tetra[0], tetra[2], tetra[3], m);
	glFlush();
}
void draw_triangle(point p1, point p2, point p3)
{
	glBegin(GL_TRIANGLES);
	glVertex3fv(p1);
	glVertex3fv(p2);
	glVertex3fv(p3);
	glEnd();
}
```

OUTPUT:




Enter the number of iterations: 5
Seirpinski Gasket


Enter the number of iterations: 6
Seirpinski Gasket


Enter the number of iterations: 9
Seirpinski Gasket