

Lecture 5

Recursion (Application)

Dr. Yusuf H. Sahin
Istanbul Technical University

sahinyu@itu.edu.tr

The STL Structure, again

- A formal definition for a 3D mesh
 - A collection of triangles.

```
solid Mesh
facet
outer loop
vertex 0.0666225 -0.00713973 -0.0520612
vertex 0.0695272 -0.00912108 -0.0509354
vertex 0.0659653 -0.00814601 -0.052367
endloop
endfacet
facet
outer loop
vertex 0.0762163 -0.00201969 -0.0587023
vertex 0.0769302 -0.00441556 -0.0564184
vertex 0.0760299 -0.00791856 -0.0610091
endloop
endfacet
```

```
struct Point{
    float x,y,z;
};

struct Triangle{
    Point *point1, *point2, *point3;
};

struct Mesh{
    DoublyList<Triangle> triangle_array;
};
```

- To easily write the functions from this session we may use two new helper functions.

```
Point* createPoint(float x, float y, float z)
{
    Point* newpoint = new Point;
    newpoint->x = x;
    newpoint->y = y;
    newpoint->z = z;
    return newpoint;
}
```

```
Triangle createTriangle(Point* p1, Point* p2, Point* p3)
{
    Triangle newtriangle;
    newtriangle.point1 = p1;
    newtriangle.point2 = p2;
    newtriangle.point3 = p3;
    return newtriangle;
}
```

The STL Structure, again

- We could generate Koch's snowflake and Sierpinski's triangle in 3D by setting $Z=0$.

