CSC418 Computer Graphics

- **Polygon Clipping**

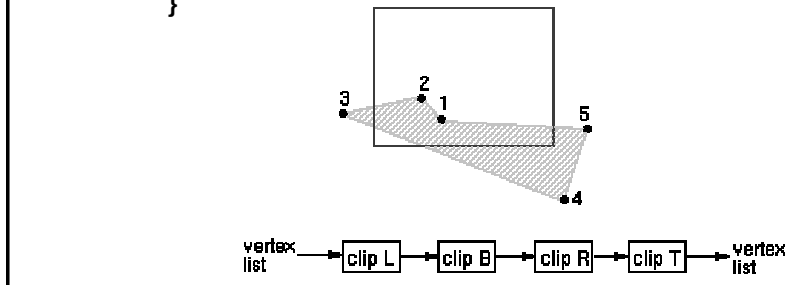
Polygon Clipping

- **Clipping is a procedure for *spatially partitioning* geometric primitives, according to their containment within some region.**
- **Why do we clip?**
  - **Distingish whether geometric primitivies are inside or outside of a *viewing region***
  - **Distinguish whether geometric primitivies are inside or outside of a *picking region***
  - **Detecting intersections between primitives**
  - **Binning geometric primitives into spatial data structures.**
  - **Shadows.**

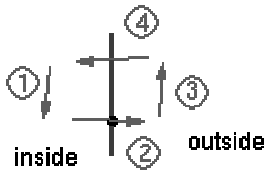
Sutherland-Hodgman clipping

- **Given: Polygon (list of vertices), clipping window (convex)**

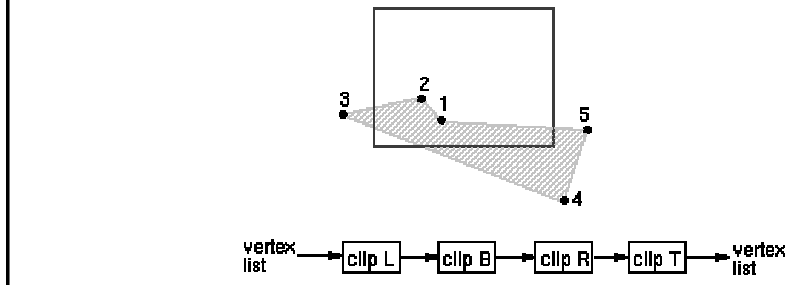
```
for each clip edge
    for each vtx and next in polygon
    {
        clip against edge
    }
```



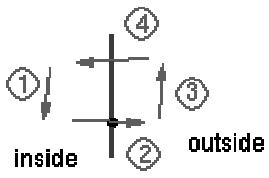
Sutherland-Hodgman clipping



case #	first point	second point	output point(s)
1	inside	inside	second point
2	inside	outside	intersection point
3	outside	outside	none
4	outside	inside	intersection point and second point



Sutherland-Hodgman clipping



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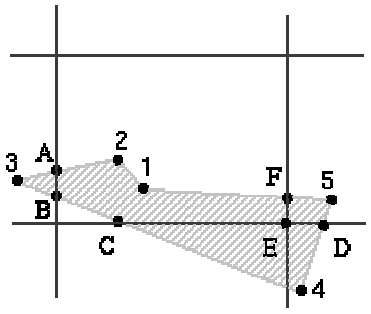
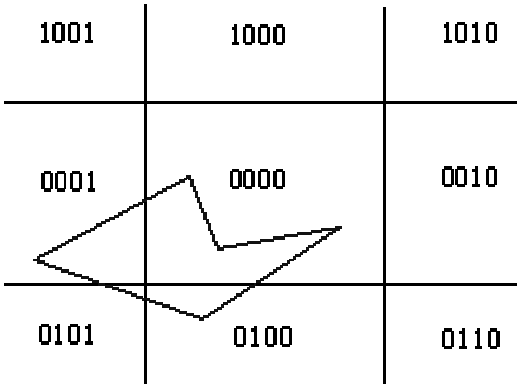


original: 1,2,3,4,5,1
clip L: 1,2,A,B,4,5,1
clip B: 1,2,A,B,C,D,5,1
clip R: 1,2,A,B,C,E,F,1
clip T: (same)

Sutherland-Hodgman clipping

- Culling before clipping



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Next Lecture….

- **Introduction to geometric transformations**