Computer Graphics

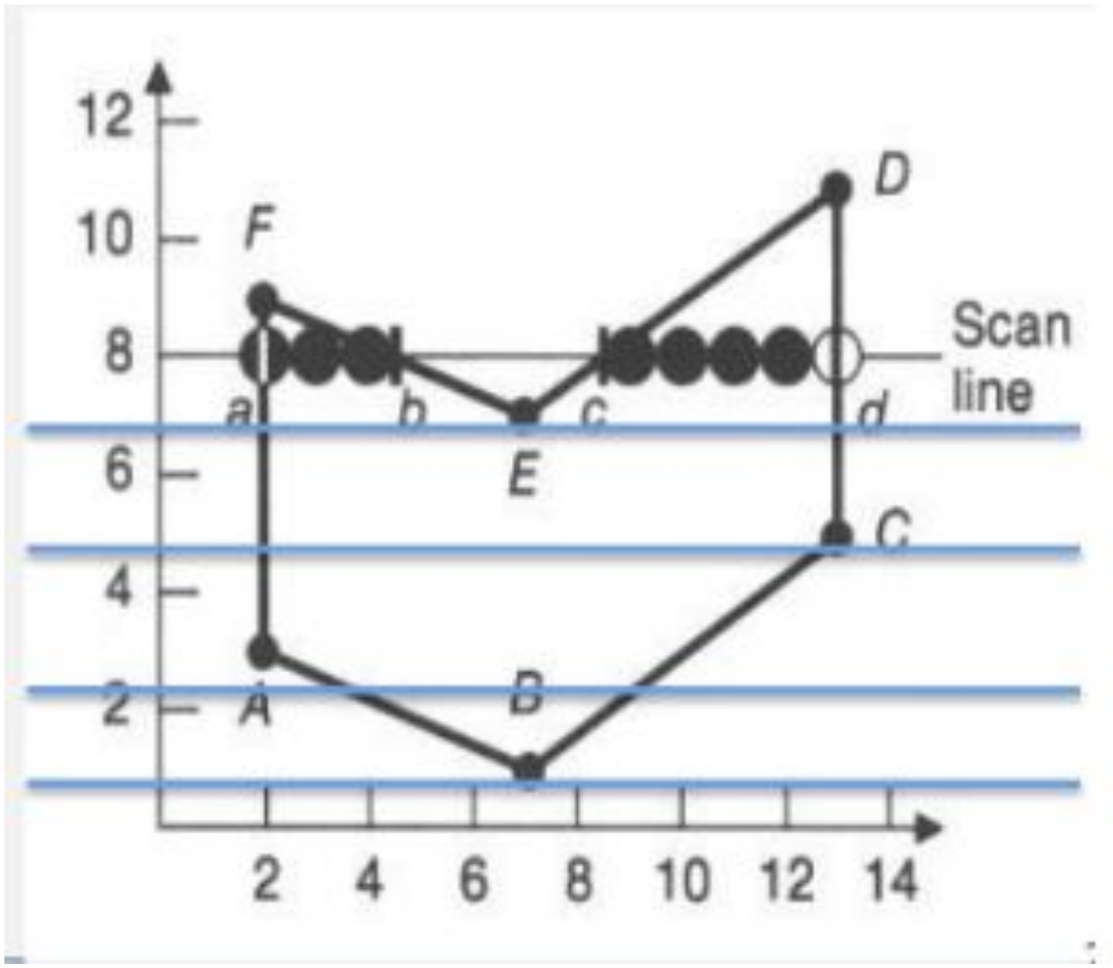
Week 6

Lecture 1

Polygon Filling

Scan Lines

We scan the drawn polygon along the horizontal lines (of screen)
Hence these horizontal lines are called Scan Lines



Basic Method

- For each scan line crossing the polygon find the intersection points with the polygon edges
- Sort the intersection points from left to right
- Fill the space between each pair of points

Coherence

- Coherence means that the properties of one part of the scene are related to another

- We will use coherence to calculate intersection points on successive scan lines

$x_{i+1} = x_i + (1/m) \rightarrow$ proof ??

Method → Bucket Sort

- → Note down all the scan lines that the polygon crosses.
- → For each edge , beginning at their starting scan line, note down: ymax,x (starting from xmin) and 1/m
- → Starting from the lowest scan line do:
  - Eliminate edges for which scan line = edge's ymax
  - Sort edges in order of increasing x values
  - fill b/w the pairs of intersection points (i.e the x values of edges on the scan lines)
  - Update x by adding 1/m to it for the next scan line

Example

traingle A(2,4) , B(4,6) and C(4,1)
quad A(2,4) B(2,7) C(4,9) D(4,6)

The End

Text

Text

Text

Text

–Johnny Appleseed