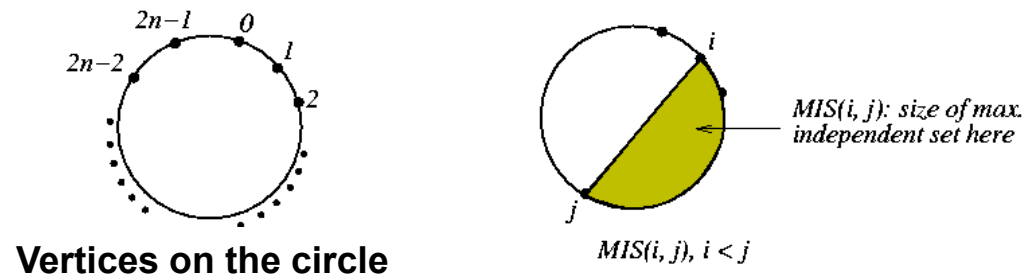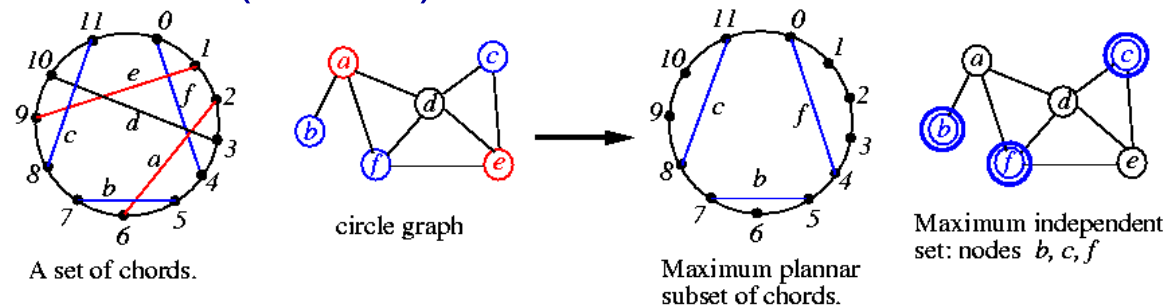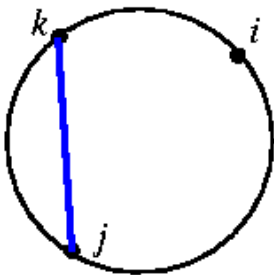# Supowit's Algorithm for Finding MPSC

- Supowit, "Finding a maximum planar subset of a set of nets in a channel," *IEEE TCAD*, 1987.

- Problem: Given a set of chords, find a maximum planar subset of chords (MPSC)

  – Label the vertices on the circle 0 to $2n$-1.

  – Compute *MIS*(i, j): size of maximum independent set between vertices i and j, $i < j$.

  – Answer = *MIS*(0, $2n$-1).

A set of chords.

circle graph

Maximum plannar subset of chords.

Maximum independent set: nodes *b, c, f*

Vertices on the circle

MIS(i, j): size of max. independent set here

MIS(i, j), $i < j$

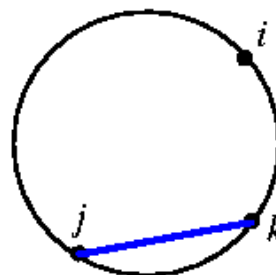# Dynamic Programming in Supowit's Algorithm

- Apply dynamic programming to compute *MIS(i, j)*.
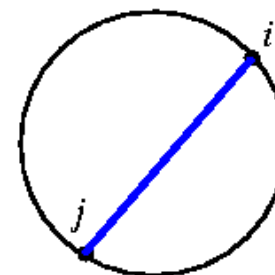
case 1

$$MIS(i, j) = MIS(i, j-1)$$

case 2

$$MIS(i, j) = MIS(i, k-1) + 1$$
$$+ MIS(k+1, j-1)$$

case 3

$$MIS(i, j) = MIS(i+1, j-1) + 1$$

$MIS(i, k-1)$

$MIS(i, j-1)$

$MIS(k+1, j-1)$

$MIS(i+1, j-1)$