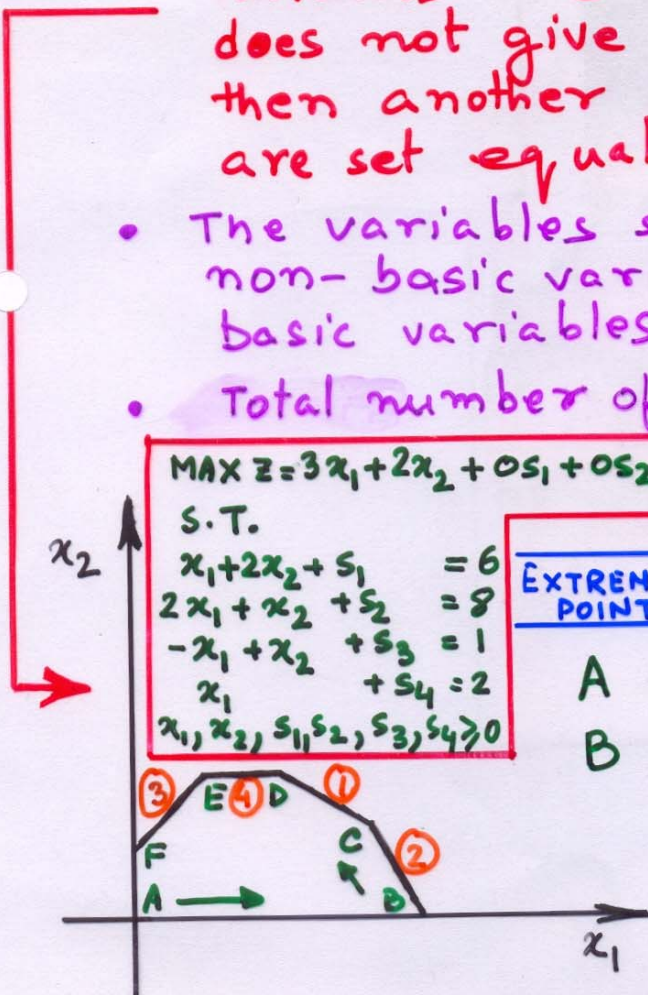# LINEAR PROGRAMMING (ALGEBRAIC METHOD) II
[SIMPLEX ALGORITHM]

SALIENT FEATURES
- Always starts at a feasible corner point
- Moves from one corner point to an adjacent corner point.
- Moves to that corner point which seems more beneficial
- Cannot / will not move to a corner point which has been visited previously
- The standard form typically has more variables (n) than equations (m).
- Each corner point is a point of intersection of the boundary planes.
- This point is obtained by setting $n-m$ variables equal to zero; the rest m variables are solved. If the solution does not give non-negative solution then another set of $n-m$ variables are set equal to zero.
- The variables set equal to zero are called non-basic variables; the rest are called basic variables.
- Total number of basic solutions $= \dfrac{n!}{m!\,(m-n)!}$

MAX $Z = 3x_1 + 2x_2 + 0S_1 + 0S_2 + 0S_3 + 0S_4$

S.T.

$$x_1 + 2x_2 + S_1 = 6$$
$$2x_1 + x_2 + S_2 = 8$$
$$-x_1 + x_2 + S_3 = 1$$
$$x_1 + S_4 = 2$$
$$x_1, x_2, S_1, S_2, S_3, S_4 \geq 0$$

EXTREME POINT	NON-BASIC VARIABLE $(=0)$		BASIC VARIABLE			
A	x_1	x_2	S_1	S_2	S_3	S_4
B	S_2	x_2	S_1	x_1	S_3	S_4

NOTE: A → B required only one swap of variables.

Also NOTE: S_2 LEAVING VAR.
x_1 ENTERING VAR.