

# SPECIAL ISSUES REGARDING SIMPLEX ALGO.

- HOW TO GET A FEASIBLE STARTING SOLUTION
  - DEGENERACY
  - ALTERNATIVE OPTIMA
  - UNBOUND SOLUTION
  - INFEASIBLE SOLUTION
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## GETTING A FEASIBLE STARTING SOLUTION

- WHEN WE HAVE SLACK VARIABLES IN EACH EQUATION WE AUTOMATICALLY GET A STARTING BASIC FEASIBLE PT. BY SETTING ALL DECISION VARIABLES EQUAL TO ZERO. (IN THIS CASE ALL SLACKS WILL BE POSITIVE).
- THE QUESTION IS WHAT HAPPENS WHEN YOU HAVE SURPLUS VARIABLES OR "EQUALITY CONSTRAINTS" IN THE ORIGINAL FORMULATION.
- IN ORDER TO UNDERSTAND THE PROBLEMS AS WELL AS THE METHODS LETS LOOK AT SOME EXAMPLES.

EXAMPLE:

$$\text{MINIMIZE } Z = 4x_1 + x_2$$

SUBJECT TO:

$$3x_1 + x_2 = 3$$

$$4x_1 + 3x_2 \geq 6$$

$$x_1 + 2x_2 \leq 4$$

$$x_1, x_2 \geq 0$$