Practice Problems-LP

1. A factory produces two types of products: **Product A** and **Product B**. The profit for **Product A** is $20 per unit and for **Product B** is $30 per unit (Manufacturing Problem).

* Product A requires 2 hours of labor and 1 unit of raw material.
* Product B requires 1 hour of labor and 2 units of raw material.
* Available Labor = 100 hours.
* Available Raw Material = 80 units.

Maximize the profit.

1. A company ships goods from two warehouses (A, B) to two markets (X, Y) (Transport Optimization).
   1. Cost from A to X = $4, A to Y = $5
   2. Cost from B to X = $6, B to Y = $3
   3. Warehouse A capacity = 70 units
   4. Warehouse B capacity = 50 units
   5. Market X demand = 60 units
   6. Market Y demand = 50 units

Minimize the transportation cost.

1. A person needs at least 2000 calories and 50g protein daily (Diet Optimization)
   1. Food A: 500 calories, 30g protein, $3/unit.
   2. Food B: 700 calories, 20g protein, $5/unit.

Minimize the cost.

1. An investor has $100,000 to invest in two stocks (Portfolio Optimization)

* Stock A: Expected return = 8%, risk = 5%.
* Stock B: Expected return = 12%, risk = 10%.

The investor wants to minimize risk while ensuring a 10% return.