

## Assignment (1)

### **Formulate a linear programming model for the following problems:**

1. A furniture firm manufactures two products, benches and picnic tables, for use in yards and parks. The firm has two main resources: its carpenters (labor force) and a supply of redwood for use in the furniture. During the next production cycle, 1,200 hours of labor are available. The firm also has a stock of 3,500 feet of good-quality redwood. Each bench that firm produces requires 4 labor hours and 10 feet of redwood; each picnic table takes 6 labor hours and 35 feet of redwood. Completed benches will yield a profit of \$9 each, and tables will result in a profit of \$20 each. How many benches and tables should the firm produce to obtain the largest possible profit?
2. A pet food company produces a low-calorie dog food for overweight dogs. This product is made from beef products and grain. Each pound of beef costs \$0.90, and each pound of grain costs \$0.60. A pound of the dog food must contain at least 9 units of Vitamin 1 and 10 units of Vitamin 2. A pound of beef contains 10 units of Vitamin 1 and 12 units of Vitamin 2. A pound of grain contains 6 units of Vitamin 1 and 9 units of Vitamin 2. How many pounds of beef and grain should be included in each pound of dog food to minimize the cost?
3. The Electrocomp Corporation manufactures two electrical products: air conditioners and large fans. The assembly process for each requires a certain amount of wiring and drilling. Each air conditioner takes 3 hours of wiring and 2 hours of drilling. Each fan must go through 2 hours of wiring and 1 hour of drilling. During the next production period, 240 hours of wiring time are available and up to 140 hours of drilling time may be used. Each air conditioner sold yields a profit of \$25. Each fan assembled may be sold for a \$15 profit. Find the best combination of air conditioners and fans that yields the highest profit.

**Deadline:** Monday 20/4/1436 H (9-2-2015)

To be submitted before 1:00 pm at my office (70-C / building 7)