

Math 460. Operations Research – Session #1

Par, Inc. manufactures standard and deluxe golf bags. Par’s distributor has agreed to buy all the golf bags Par produces over the next three months.

Par’s management has determined that each golf bag produced will require the following operations:

1. Cutting and dyeing the material
2. Sewing
3. Finishing (inserting umbrella holder, club separators, etc.)
4. Inspection and packaging

Each standard bag requires  $7/10$  hour in the cutting and dyeing department,  $1/2$  hour in the sewing department, 1 hour in the finishing department, and  $1/10$  hour in the inspection and packaging department. Each deluxe bag requires 1 hour in the cutting and dyeing department,  $5/6$  hour in the sewing department,  $2/3$  hour in the finishing department, and  $1/4$  hour in the inspection and packaging department.

Par’s production is constrained by a limited number of hours available in each department. Par estimates that during the next three months 630 hours will be available for cutting and dyeing, 600 hours will be available for sewing, 708 hours will be available for finishing, and 135 hours will be available for inspection and packaging.

Par has also estimated that it will realize a profit of \$10 for every standard bag produced and it will realize a profit of \$9 for every deluxe bag produced.

Let us help Par determine the number of each type of bag to produce in the next three months to maximize its total profit from the production of golf bags.

Summarize the production requirements per golf bag by completing the table below.

Production Time (hours)			
Department	Standard Bag	Deluxe Bag	Hours Available
Cutting/Dyeing			
Sewing			
Finishing			
Inspection/Packaging			

Construct a mathematical formulation for Par’s problem.