

The Delight Dairy (DD) Company produces a broad line of dairy products. For production planning purposes, the products have been aggregated into two major classes: Ice Cream (many flavors, many package sizes) and Specialties (ice cream sticks, ice cream sandwiches, prepackaged ice cream cones, etc.). While each class has its own distinct packaging equipment, the two classes use a common, single ice cream manufacturing machine; they also use the same pool of experienced labor to produce and package each class of product.

The "Ice Cream" class requires two hours of the ice cream manufacturing machine, one hour on its own packaging line and three man-hours of labor to produce 1000 gallons of finished product.

The "Specialties" class requires one hour of the ice cream manufacturing machine, one hour on its own packaging line, and six man-hours of labor to produce the equivalent of 1000 gallons of finished product. One thousand gallons of Ice Cream can be sold by DD for \$300 while the equivalent of 1000 gallons of Specialties can be sold for \$500. (Raw material costs are approximately equal for 1000 gallons of the two classes of product.)

The company currently works a one-shift operation (40 shop hours/week) and currently employs three full-time employees and one 3/4 time employee for a total of  $120 + 30 = 150$  man-hours/week.

1. Formulate a linear programming model for production planning for DD
2. Solve using the simplex algorithm