OMGT3223 LP Example

1. Steve's Modified Shave Ice: LP Problem

Steve's Shave Ice produces four flavors of shave ice mix: Maui Waui, Waikiki Gold, Kaneohe Krazy, and Nanakuli Niceness. For each gallon of Maui Waui produced a profit of $7.00 is realized, for every gallon of Waikiki Gold $8.00 is realized, and for every gallon of Kaneohe Krazy $8.50 is realized, and for every gallon of Nanakuli Niceness $8.25 is realized. Steve has 227,000 units of line capacity to produce mix each month. Maui Waui takes 3.5 units of line capacity per gallon, Waikiki Gold uses 6 units of line capacity per gallon, Kaneohe Krazy uses 5 units of line capacity per gallon, whereas Nanakuli Niceness uses 4.5 units of line capacity per gallon. A gallon of Maui Waui takes 3.0 ounces of flavoring, a gallon of Waikiki Gold takes 6.0 ounces of flavoring to produce, a gallon of Kaneohe Krazy takes 2.5 ounces of flavoring to produce, and a gallon of Nanakuli Niceness takes 5.0 ounces of flavoring to produce. Steve can only obtain 167,500 ounces of flavoring for production. Steve has already promised a customer 8,000 gallons of Waikiki Gold. He must make at least twice as much Maui Waui as Kaneohe Krazy due to an old State law. Steve has the ability to hold at any time 45,000 gallons of finished shave ice mix in total in his finished goods refrigerator. Formulate an LP to maximize profit from the sale of shave ice mix. It is possible for Steve to produce partial gallons of mix.

What are the decision variables?

What is the objective function?

What are the constraints?

What are the non-negativity assumptions?

Write the LP in standard form.