A linear programming problem

Math 10120, Spring 2014

April 7, 2014

A diet - of – bananas — and beer

I need at least 2000 calories a day, at least 325g of carbohydrates, and at least 2mg of vitamin B-6.
Bananas give me 105 calories each, 27g of carbohydrates, .45mg of Vitamin B-6, and cost 90 cents each.
A bottle of beer gives me 180 calories, 13g of carbohydrates, .2mg of Vitamin B-6, and costs 70 cents.
If I want to have a healthy diet of bananas and beer, at minimum cost, how much of each should I consume each day?
Let x be the number of bananas I eat per day, and y the number of bottles of beer. I want to choose $x \geq 0$ and $y \geq 0$ so that

$$\begin{aligned} 105x + 180y &\geq 2000 \\ 27x + 13y &\geq 325 \\ .45x + .2y &\geq 2 \end{aligned}$$

are all true, and I want to make this as small as possible:

$$90x + 70y$$