

## Supper-Ball Auction

With the NSF playoffs on the verge of finishing (four teams left), we're running an auction on the winner of the Supper-Ball for extra credit. We'll allow you to bid on certain teams winning the Supper-Ball and, if your bid is accepted and one of your selected teams wins the Supper-Ball, you'll receive extra credit points. We'd like everyone in the class to participate. This exercise will demonstrate how optimization techniques can be used to organize a complicated multi-state auction.

### How does the auction work?

Student will submit bids for the auction. For each bid that you submit, you must specify three things: the teams that you are bidding on, the price limit and the quantity limit. The quantity limit represents how many bids you would like to submit for a particular set of teams and price limit. We're allowing each student to submit up to 10 bids. You can have all your bids be the same or have separate cases. With each bid, you must specify which teams you want to bid on. Choose any number of teams from 1 to 4. For each bid, you must submit a price limit which is the most that you are willing to pay for this bid. Don't worry, you don't need to actually pay the price limit. The auction is free to participate in.

After all bids are received, we will use an optimization algorithm to determine which bids are accepted and which are rejected. If your bid is accepted and one of your selected teams wins the Supper-Ball, you will receive 100 extra credit points. Your net extra credit would be 100 minus the price that you were charged for your bid (this price will be less than or equal to your limit price).

### Example

The 4 teams remaining in the playoffs are:

- i) 1. Broncos
- ii) 2. Steelers

iii) 3. PANTHERS

iv) 4. SEAHAWKS

Now imagine that you believe that the Steelers or Seahawks will win the Supper-Ball. You could submit your bids as follows:

Teams	{2,4}
Price limit	60
Quantity Limit	10

Now, imagine that your bid was accepted with a price of 55 and the Steelers won the Supper-Ball. Your net extra credit points would be  $(100 - 55) * 10 = 450$ .

Note that there is a chance that your bid will be accepted but not for the full quantity that you requested.

### **How will the extra credit be awarded?**

Each 100 points of net extra credit that you win from the Supper-Ball auction will be worth 2 point to your average homework score. So, if you win 300 net extra credit points and had an average homework score of 85%, we would adjust your homework score to 91%.

### **Logistics**

You will need to email your bids to me by 11:00 pm, Saturday, January 21, and I'll announce the winning bids Sunday morning.

Please submit your bids in the following format (if you have multiple bids with different teams, please have each bid look like the following):

Teams	specify teams according to the numbers above
Price limit	some number between 0 and 100
Quantity Limit	some number between 0 and 10