

1. Show that the greedy algorithm will assign at least 4 of the 6 queries xxyzz.

Because the optimal one algorithm would yield a revenue of 6, that mean:

A bids on 2 x,

B bids on 2 y

C bids on 2 z

Thus, all queries will be bided, revenue == 6

But for the worst situation:

C bids on 1 x 1 y

B bids on 1 x 1 y

A can not bids anything

Thus, 4 of 6 queries will be bided in worst situiton, revenue == 4

2. Assume the query sequence xyzz

In optimize off-line algorithm, A->x, B->y, C-> 2Z, the revenue == 4

In greed algorithm, C->x,y B->nothing, A->nothing, the revenue == 2

The revenue of off-line alg / the greed alg == $4/2 = 2$