CS 4720 Networks, Crowds, and Markets

Homework # CHANGE ME!

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Suppose there are 2 ad slots each with its own clickthrough rate:

Slot	Click Through Rate
a	10
b	7

And suppose there are 3 advertisers:

Advertiser	Valuation Per Click
x	10
y	9
z	2

We also suppose that the search engine assigns ad slots using a Gnereralized Second-Price (GSP) auction, and answer the following questions:

1. In this problem, is truthful bidding a Nash equilibrium? To receive full credit, you must either prove that truthful bidding is a Nash equilibrium or show which advertiser(s) could profit by changing their bid away from truthful bidding.
2. Find a Nash equilibrium for this problem (without truthful bidding) in which the total advertiser valuation is maximized (i.e., advertiser x is assigned slot a and advertiser y is assigned slot b). You may use any technique you want to find this Nash equilibrium, but you must convince me that it is an actual Nash equilibrium.
3. Create a new sponsored search problem with at least 2 slots and at least 3 bidders in which truthful bidding is a Nash equilibrium.