

# Sample solution of Quiz 3

April 13, 2007

## Question 1

1) Please recall that Google determines the rank of an ad by AdRank and its formula is: **AdRank = Cost × Relevance**

Hence the rank of the web pages would be:

Web page	AdRank	Rank
RaleighMazdaAndToyota.com	18	1
MarcJacobsen.com	16	2
Cars.com	12	3
BuyFordFusion.com	5	4

2) Since none of the advertisers have used up their budget of the day and MarcJacobsen.com is currently ranked second, to keep its rank it will have to pay no less than 16 cents per click ( $0.8 \times Cost > 12$ , where 0.8 is the relevance score for MarcJacobsen.com and 12 is the AdRank of Cars.com, which is ranked one position lower than MarcJacobsen.com)

3) Two types of click fraud are: a) They can click on higher ranked competitors' links (RaleighMazdaAndToyota.com in our example) numerous times so that they would run out of budget and would no longer show up on a search result. b) Click on the next lower ranked ad (Cars.com in our example) and knock them off, so that they would have to pay less.

## Question 2

Before storing web pages in repositories, Google extracts information that can hint their location. Moreover, whenever a search is performed, Google and other search engines, which typically have several computer farms across the world, extract the users location from the IP address and forward the request to the nearest server. Combining the obtained information, Google can filter the query results and index access and return localized search results.

## Question 3

False.

## Question 4

With the introduction of PATRIOT act, Google, like many other ICT companies, is legally required to share private and personal information of its customers with the Government. Moreover, the Government need not inform that person.

## Question 5

(i) Advertiser's have to trust that Google is doing its best to prevent click fraud (because click fraud helps Google while it hurts advertisers), (ii) how we trust Google to keep data about our searches and email private.