GOOGLE AD WORDS MEMORANDUM

TO:	Google
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SUBJECT:	Google Ad words Case Study
DATE:	May 09, 2021

INTRODUCTION

The purpose of this memo is to provide recommendations on which advertiser should display each ad for each query to help Google maximize their total revenue. We have evaluated and documented the analysis on the budget and estimated query constraints that we used to determine the optimal solution. We recommend google to use the ad display numbers for each query provided by our team **(See Table 1)** because with this solution, google can get maximum revenue of $428.

APPROACH

Google is seeking to maximize their total revenue by figuring out which ads to display within each query. We analyzed on the price per click and click through rate for each of the AT&T, T-Mobile, and Verizon advertiser on three different search queries. We then calculated the average price per display of each ad for each query using the given price per click and click through rates. We are also provided with the maximum number of times ads can be displayed for each query and the total budgets for each of the advertisers. Our team ran an optimization analysis to determine the most optimal decision on the number of ads to be displayed for each query. We set our constraints such that average amount paid by each advertiser does not exceed its budget and the total number of ads displayed for each query cannot exceed the estimated

number of requests for that query. By going with this course of action, we arrived at a solution where the number of times an ad is displayed, is equal to the maximum count of estimated queries. The total budgets for the advertisers were all met except for AT&T which is just under by $2.00. The maximized total revenue for the day is $428.00.

RECOMMENDATIONS

By conducting an optimization analysis, we were able to come up with the following conclusion on the best way to maximize Google's total revenue. We recommend that Google use the ad display numbers for each query provided below by our team because when viewing the sensitivity report, we determined this is the most optimal solution. Within the sensitivity model, the decision variable sections guarantee us the solution is the most optimal. The allowable increase and allowable decrease columns all show units under 1, meaning there is little room to move from the solution that was found.

Table 1: Number of times to display each ad for each query

Advertiser	Query 1 "5G network"	Query 2 "Largest 5G network"	Query 3 "Best 5G network"
AT&T	40	40	80
T-Mobile	100	0	0
Verizon	0	40	0