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36106 Managerial Decision Modeling
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Maximizing Click-Through Revenue¹

The purpose of this example is to illustrate how modeling is applied to maximizing click-through revenue for content publishers. Content publishers such as CNN, Yahoo, *The NY Times*, etc. generate revenue by using banner ads. See, for example, Figure 1 below which is the top of the first page of *The New York Times*.



Figure 1: *The New York Times* front page

Typically an advertiser does not contract directly with a content publisher. Rather, they go through an ad network that would include an ad exchange such as DoubleClick or RightMedia. For example, if on your Web browser you select View Source you will observe that many of *The New York Times* ads are being served up through DoubleClick.

This market can get confusing because some companies play multiple roles. For example, Yahoo is a content publisher but also acts as an ad exchange through its subsidiary RightMedia. Google owns DoubleClick. Also, the ad exchanges make extensive use of cookies in order to more effectively direct ads to the appropriate viewers. Mr. Ron Swanson, Director of the Parks and Recreation, in mythical Pawnee, Indiana has discovered this phenomenon much to his chagrin and regret. Here is Ron discovering cookies <https://www.youtube.com/watch?v=ABY3GLf7wU4>.

We are going to make life easy while still capturing the critical modeling features of this important revenue maximization problem. Assume that there are three companies that wish to advertise with *The New York Times* and that they contract directly with *The New York Times*. I have selected three companies that recently advertised with the paper.

¹This case is based on the case *Advertising at Marine Weekly* written by Dan Iancu of Stanford University.

They are Kentucky Fried Chicken (a chain of fast food restaurants), Dot & Bo (a furniture company) and Alpha-Wars (a video game). As you can observe from Figure 1 there are various sections of the paper that the reader can click on. We assume that Politics and Sports are the only two sections in our model. The model easily extends to any number of sections and any number of advertisers.

In Table 1 are click-through rates that are estimated through historical data or tracking methodology. For example, for KFC, every 100 page views in the Sports section is expected to generate four click-throughs. For Dot & Bo, every 100 page views in the Politics section is expected to generate five click-throughs.

Table 1: Click-Through Rates

| | KFC | Dot&Bo | Alpha-Wars |
|----------|------|--------|------------|
| Politics | 0.01 | 0.05 | 0.01 |
| Sports | 0.04 | 0.02 | 0.06 |

Assume that, on average, every day the Politics section gets five million views and that the Sports section gets two million views. Further assume that *The New York Times* has contracted with KFC for two million page views per day, with Dot & Bo for three million page views per day, and with Alpha-Wars for one million page views per day. The contract specifies that *The New York Times* will receive 10 cents per click-through from each of the three companies.

Build a model that will maximize the click-through revenue for the *The New York Times* while meeting the contractual obligations with KFC, Dot & Bo, and Alpha-Wars.