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1) **Write code in a programming language of your choice that determines**

**the best allocation of 5 ads to users in a given social network across 2**

**stages. You will be provided an edge list.**

Please see *orproject\_1.py* for program that allocates 5 ads to users over 2 stages.

Using data.txt the program outputs the following :

*“The highest expected number of clicks is obtained by giving 2 impressions in the first stage to ('Pat', 'Tom') and 3 impressions in the last stage for a total of 1.4 clicks”*

2) **Research and derive an alternative model for influence than the one we**

**discussed in (eq 1) and use it in your code from (1).**

Referencing the 2014/5 paper by Abassi et al. (<http://dx.doi.org/10.1145/2736277.2741648>) they performed much of their analysis using square root x as their influence function. See *orproject\_2.py*

p ← max{0, min {1,0.25 + α \* (n/f)^0.5 } } The result was :

*“The highest expected number of clicks is obtained by giving 2 impressions in the first stage to ('Pat', 'Tom') and 3 impressions in the last stage for a total of 1.4185127327627016 clicks”*

3) **Compare and contrast the results of (1) and (2).**

Naturally since n <= f for all n,f then n/f <= 1 and it follows that >= n/f

This has the effect of increasing the probability more than the stated function and as such a higher expected number of clicks.

The function is valid since it is monotonic increasing and differentialble.

Both approaches have the overall effect of targeting seed individuals who have the ability to influence others by virtue of the graph structure. So much like infectious disease which spreads out from some epicenter, this heuristic targets highly connected subgraphs. As such Pat with 4 friends near the center of the graph was an obvious choice.

As an aside please see *orproject\_3.py* which explored the idea of of being penalized for being on the fringes of the graph and rewarding centrality. The result was :

“*The highest expected number of clicks is obtained by giving 3 impressions in the first stage to ('Ted', 'Mary', 'Joe') and 2 impressions in the last stage for a total of 1.3104687499999998 clicks*”

This result is inferior but was interesting because it resulted in a much different selection of seed influencers.