Your company is looking at optimizing their social media marketing by investing in various advertising campaigns. There are 250 Instagram campaigns and 250 Facebook campaigns available. Each runs for one month and reaches 30,000 people. Revenue for each campaign is found as numberOfCustomersReached\*conversionRate\*customerPurchaseAmount. Profit for each campaign is found as Revenue – Cost.

You're not sure how much your budget requirement is hurting your marketing efforts, so you would like to see how sensitive your results are to your budget. How profitable will you be if you have a higher or lower budget? You would like to evaluate every budget option in $500 intervals between $500 and $10,000 (i.e. $500,$1000,$1500, etc.). Assume you can invest a partial amount (however small you would like) in each campaign, but you can't run each campaign more than once. To evaluate the different budget options, write a function which takes in budgetThreshold as an input and outputs the number of campaigns run, total cost, total profit, average percentage reach to existing customers, average percentage reach to new customers, and average percentage reach to female customers. Return these values in a csv file. The csv file should have 20 rows and the columns should be:

* 1. budgetThreshold
  2. numberOfCampaigns
  3. totalCost
  4. totalProfit
  5. mean%reachToExistingCustomers
  6. mean%reachToNewCustomers
  7. mean%reachToFemaleCustomers

Hints:

Assuming you have an lp object with X decision variables i.e.

lp = make.lp(0,X)

To set all variables to be between 0 and 1 use the following command:

set.bounds(lp,lower=rep(0,X),upper=rep(1,X))

There are multiple ways to solve the third part of the prompts. A for loop would be one approach.

sapply(X=values, FUN=myFunction)