Budget Reallocation using Bayesian MMM

- The predicted revenue is summed up to get monthly predicted revenue.
- The present year's monthly revenue is also calculated.
- The budget allocation of the current year is calculated by the formula:

Channel wise % = (total yearly revenue of that channel/total yearly revenue)* 100

- Next year's budget allocation is found out using the Bayesian MMM (using PyMC)which calculates the budget allocation of each channel by estimating the coefficients of each channel's budget influence.
- A constrained optimization problem is solved using Differential Evolution to maximize revenue.
- The objective function balances revenue maximization with a penalty for violating budget constraints.

These are the final results:

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            Channel  past_budget_allocation  future_budget_allocation
0                TV               29.660227                  3.216990
1           Digital              365.367769                183.453880
2       Sponsorship                8.027973                  7.989883
3  Content Marketing             193.639614                 39.353142
4   Online marketing              61.369784                 15.659670
5         Affiliates              91.202143                 13.512334
6               SEM                4.670000                  4.465768
7             Radio               48.022545                  6.761486
8             Other              353.595482                105.442490
Total investment in past year 846.5103701313128
Total investment in future year 379.85564228743726
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