Home equity loan research proposal:

Scenario: You're a data scientist for J.P. Morgan's(JPM) home equity loan division.

The **problem** is how can we lower home equity loan delinquency rates? It's understood that the largest contributing factors to delinquencies are economic events, divorce, and lack of assets. Seeing how we can't really control the economy or the will of our spouses, the question is how do we increase homeowners' assets?

JPM clients that are looking to take out a home equity loan will be given a fee. The fee will be .05% of the original equity loan. It will be placed in a medium risk portfolio(50%stock and 50%bonds). JPM will manage the portfolio. If the client falls into delinquency, JPM will void the delinquency, and add the available amount in the portfolio. This will on average cover a months payment right from the start of the loan.

An existing team is working on testing adoption implementation of the program; my focus is testing if delinquencies will meaningfully improve after adoption.

The **hypothesis** is that for those that opt-in, delinquencies will decrease. The **null hypothesis** is that delinquency rates increase. The probability of a type 1 error is 5%. We can run a t-test, if the t-test shows a p-value of less than .05 then we can say that the decrease in delinquencies is due to the added fee and not just chance.

The test will consist of one random sample from JPMs equity loan clients that have adopted the program. The control group will be the portion of the equity population that doesn't have the added plan. The test will be run for 1 year, if delinquencies decline then the option will be adopted for another 1.

Potential downfalls:
-PCI equity loans are purchased loans with credit scores that have been damaged since the loans origination. Including these loans may skew the results.
-Problems in adoption implementation for all purchased loans.
-Looking only at JPMs data may skew results.
-Characteristics of HELOCs vs HELOANs may skew results.
-Characteristics of Senior liens(primary interest) and Junior liens(secondary interest) may skew results.

Getter, Darryl E. "Contributing to the delinquency of borrowers." *Journal of Consumer Affairs*, vol. 37, no. 1, 2003, p. 86+
https://jpmorganchaseco.gcs-web.com/node/210081/html