Executive Summary

Problem A

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Abstract

The model we constructed is designed to model the way a trend in appearance will be adopted or not within a closed group, and the way the members of the group interact with and influence each other. For our model we are using beanies as the trendy fashion aspect that changes and will use the words trend and beanies interchangeably. The model takes social standings, preferences of each group member towards the trend, and whether or not each member is willing to make a decision to either adopt wearing beanies or not purely on their preferences, and predicts the behavior of the group.The model uses a series of simulated coin flips to mimic the somewhat random behavior of people, while still being able to represent binary choices. After evaluating multiple simulations of the model, we found that on average, the ratio between adopters of the trend and non-adopters of the trend is 2:1, so two-thirds of a closed group will adopt the trend, which is wearing beanies in our case.

Problem

The problem our model attempts to solve is how to simulate the way a closed group will react to a trend, and whether or not they will conform to the majority decision collectively made in the group. The model should predict how many group members will adopt the trend as a result of their interactions with other group members and predict how long it will take for a member to adopt the trend.

Model

Our model utilizes three assumptions about the group members and the trend.

The first assumption is that all the members of the group can be divided into three social classes, Alpha, Beta, and Gamma. We define Alphas as people who are popular and are highly interactive and influential in the group. Betas are defined as an average person in the group that are not special in any sort of way, with some influence in the group. Gammas are defined as people who are unpopular and have very low amounts of interactions and have very little influence.

The second assumption is that all the members of the group can initially be categorized as an early adopter or non-adopter of wearing beanies or are undecided. The undecided will then base their decision to adopt the trend or not based on their own feelings towards beanies, the majority decision of the group, and what social class the majority is comprised of the most. After the undecided make their decision, the group will have been split into those who have adopted the trend, and those who have not.

The third assumption of the model is that all the members of the group are equally exposed to the trend so that the model can focus on the interactions and decisions of the group.

The model is designed to use a series of simulated coin flips to first classify all the group members as an Alpha, Beta, or Gamma. This is done with a single coin flip that determines if the member is an Alpha or not Alpha. Then the not Alpha group goes through another coin toss to determine if they are a Beta or Gamma. Next two more rounds of single-coin coin flips are performed to randomly determine whether a person will like or dislike the trend, and then to randomly determine if they have made their decision on adopting the trend yet. For all the members who have made a decision, if they were determined to like the trend they will be classified as early adopters (EA), and if they were determined to dislike the trend then they will be classified as non-adopters (NA).

The model will now take the ratio of EA to NA and determine if the ratio is 1:1 or not. If EA:NA is equal, then all the undecided members will then base their decision purely on their initial preference to determine if they are going to start wearing beanies or not. If the ratio is not 1:1 then the model will determine which group, the EA or NA, is larger. It will then calculate what social standing group makes up the greatest percentage of the majority group of those who have already made a decision.

The model now switches to using a double-coin coin flip so that the decision is not 50-50 to allow the social standings of the majority group to have a role in the undecided member's decision. A different set of rules is used for each combination possible of NA>EA or EA>NA (NA and EA are the majority groups respectively), the social standing that is the most prevalent in the majority group, and whether or not the undecided person initially liked or disliked beanies. This will then determine how many second-wave adopters of beanies there are, and how many second-wave non-adopters there are. These amounts are then added to the early adopters and the initial non-adopters to get the final amount of beanie adopters and non-adopters in the group.

Findings

Our model simulated multiple trials to produce average adoption values. We found that the average amount of Early Adopters was 25.67 and the Average amount of Non-Adopters was 21.33. We also found the ratio of the average amount of total Adopters to the average amount of total Non-Adopters was 2:1. We also determined that there are waves of adoption for the trend, so the members who had made the decision to adopt will adopt the trend before the undecided members. We also predict that there will be some variance in the appearance of all the members who will adopt wearing beanies. For example, different colors of beanies to align with member's preferences.