**Amazon Beauty Recommendation Engine**

**Key Problems / Issues:** As a beauty retailer on Amazon, you want to determine if there is an optimal way you can recommend products to customers.

**Neural Network:**

* The purpose of this neural network is to make predictions to see if customers would like a product
* The three variables I am looking at are (User ID, Product ID, and Rating)
* By creating a neural network on users’ history of the products and how they rated it the model would recommend products
  + Inputs:
    - *User ID (reviewerID)*
    - *Product ID (asin = amazon standard identification number)*
  + Output: *Rating (overall)*

**How It Works:**

For Example: We want to predict products Customer-B would likely want to buy

* Customer-A buys Product 1 and rates it 5/5 stars with 5 being the highest value
* Customer-A then buy Product 2 and rates it 5/5 stars
* Customer-B buys Product 1 and rates it 5/5 stars

Therefore the model would recommend that Customer-B would like Product 2.

**Analyses:**

**Option 1: Fully Connected Neural Network**

**Option 2: Gradient Boosted Decision Trees -XGBoost**

**Summary:**

The results from Option1 had an RMSE of 1.32, and the Option2 has an RMSE of 0.33. The XGBoost model can more accurately predict the rating of a product than the neural network.