

## DEEP LEARNING INTERVIEW PREPERATION

**Question 1: How would you approach feature engineering to prepare this data for model training?**

**Solution:** Transforming raw data into numerical features.

Checking for different features in the data whether they are numerical or categorical and converting into numerical where deep learning model can understand.

Customer data includes purchase history, browsing behavior, demographics and social media activity as features.

- I. **Purchase history** includes different categories(dresses, price, etc.) need to convert categorical into numerical format on the clothing style, amounts and can implement one-hot encoding.
- II. **Browsing behavior** : implicit actions performed by user shows time spend on browsing categories, pages viewed, click through rates on recommendations. Converting this time spent into numerical format.
- III. **Demographics** : provides details about the customer details like age, gender, geographic location, occupation etc. These all would be in categorical and can be converted to numeric features.
- IV. **Social media activity** : The information can be grabbed by user reviews/comments for a particular product using sentiment analysis by using required libraries.

**Handling missing values** Could implement imputation techniques (median/mode) or can remove the row if it has more missing values.

**Data normalization** should be performed as all the features share the similar scale and can perform model training.

**Question 2 : There are various deep learning architectures suitable for customer behavior prediction. Considering the specific task of predicting clothing preferences, discuss two different deep learning architectures you might consider and the advantages/disadvantages of each in this context.**

**Solution:** Based on the potential use case we will be considering the models.

**Convolutional Neural Networks** : model is suitable for image datasets where pattern recognition within images is crucial.

**Disadvantage:** It might take longer time to process images.

**Recurrent Neural networks :** is ideal for time-series data or when you need to remember previous inputs which includes LSTM model.

**Multi-Layer Perceptron :** A basic form of neural networks used for tabular datasets, suitable for straightforward prediction problems.

**Recommendation system :** Can integrate neural networks with recommendation system-collaborative filtering to predict clothing preferences.

**Disadvantage:** Deep learning has black-box effect as it is difficult to understand how the model is making predictions and identifying the factors that influence the predictions. High computation cost include GPU or large amount of memory.