**Fashion Recommender System with ResNet50**

**This fashion recommender system leverages the power of deep learning, specifically the ResNet50 convolutional neural network, to extract visual features from fashion images. These features enable similarity-based recommendations, helping users discover new styles they'll love.**

**1. Deep Learning for Visual Feature Extraction**

* **CNNs for Feature Extraction**: The code uses ResNet50, a model known for its strong performance in image recognition tasks, as a feature extractor by removing its fully connected layers (include\_top=False). This approach has been widely adopted in visual recommendation systems, as CNNs can extract high-dimensional feature representations that capture the visual semantics of images.
* **Global Max Pooling Layer**: The addition of a GlobalMaxPooling2D layer after the ResNet50 model reduces the feature map to a lower-dimensional vector, helping to simplify the feature representation. Such pooling operations help retain only the most significant features, improving computational efficiency without significantly compromising accuracy.

2. **Feature Extraction and Export**

The code extracts features from each image in the dataset using the ResNet50 model and saves these features as embeddings in a serialized format.

These embeddings are stored in a file called embeddings.pkl, while the filenames are stored in filenames.pkl using the pickle library. Exporting these features prevents the need to repeatedly recompute them, which saves time and computational resources

**3. Generate Fashion Recommendation using KNN**

* **Euclidean Distance and k-Nearest Neighbor**: By normalizing the extracted features and using a NearestNeighbors model with Euclidean distance, the system finds visually similar items based on proximity in the feature space.

**4. Streamlit Integration for User Interaction**

This code incorporates Streamlit, an interactive web application framework in Python, to create a user-friendly interface for image upload and recommendation display. This setup allows users to upload an image, view the extracted features, and receive visually similar fashion recommendations, facilitating practical use and exploration