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# Problem Statement

Hey Myntra,

**Trend Generation:** It is well understood that fashion is cyclical, with many vintage styles such as scrunchies and boot cuts making a notable return. Considering this pattern, hats could very well be the next trend. As a leading fashion brand, Myntra should capitalize on these opportunities by incorporating them into the TrendNXt feature. Vintage fashion often serves as an excellent source for generating future trends.

**Trend Identification:** As you aim to showcase the latest trends prominently on your homepage and uphold your position as a leading fashion brand. Keeping up of current trends presents a significant challenge. Women's diverse perspectives make it challenging to discern what's trending and what's not. Recognizing women as primary trend creators underscores the importance of leveraging their insights to accurately identify emerging fashion trends.

# Solution

## Trend Identification Using Deep Learning Techniques

### 1. Image Preprocessing:

- Load fashion images and resize them to 224x224 pixels.
- Normalize pixel values for consistency.

### 2. Feature Extraction with VGG16:

- Use the VGG16 model pre-trained on ImageNet.
- Extract features from the 'block5\_pool' layer and flatten them.

### 3. Synthetic Metadata Generation:

- Create synthetic timestamps for each image within a defined date range.
- Combine filenames and timestamps into a metadata DataFrame.

### 4. Combining Features and Metadata:

- Merge the extracted features with the metadata.
- Set the timestamps as the DataFrame index for time-based analysis.

### 5. KMeans Clustering:

- Apply KMeans clustering to group images based on extracted features.
- Assign each image to a specific cluster.

# Solution

## 6. Trend Visualization Over Time:

- Plot average feature values for each cluster over time.
- Identify and analyze fashion trend patterns for each cluster.

## 7. Cluster Analysis:

- Calculate centroids for each cluster.
- Compute mean, median, and standard deviation for clusters to understand their characteristics.

## 8. Dimensionality Reduction with PCA:

- Reduce features to 2D using PCA.
- Visualize clusters in a 2D space for better interpretation.

## 9. Label Prediction with VGG16:

- Predict top-3 labels for each image using VGG16.
- Decode predictions to get human-readable fashion labels.

## 10. Trend Identification:

- Store and analyze predicted labels to identify prevalent fashion trends.
- Use clustering and statistical analysis to understand the evolution of trends over time.

# Solution

## Trend Generation Using Prompt Engineering Techniques

1. Input: Vintage fashion images.
2. Model: Gemini 1.5 Flash Pro.
3. Process: Design prompts to describe the transformation of vintage styles into Gen Z styles.
4. Output: Send these descriptions to Stable Diffusion to generate the corresponding images.

## Trend Generation Using GANs and Prompt Engineering

1. Data Collection: High-quality Vintage and Latest fashion images.
2. Model: CycleGAN.
  - Generator: Converts trendy images to vintage and vice versa.
  - Discriminator: Ensures generated images appear original.
3. Technique: Fuse generated images using pattern transformation and style transfer techniques.
4. Output: Generated images are further processed.
5. Enhanced Output: Use Gemini 1.5 Flash Pro to describe how the fused images can be transformed into new styles.
6. Final Output: Send these descriptions to Stable Diffusion to generate the final images.

# Solution

## Style Transfer for Accessories

### 1. Model Selection:

- Use a pre-trained VGG19 model to extract features from images.

### 2. Image Preparation:

- Load, resize, and normalize the content and style images to match the VGG19 input requirements.

### 3. Feature Extraction:

- Pass the content and style images through the VGG19 model to extract their features.

### 4. Style Transfer Goal:

- Blend the content of the content image with the style of the style image by optimizing a generated image.

### 5. Loss Function:

- Minimize content loss (difference between content image and generated image) and style loss (difference between style image and generated image).

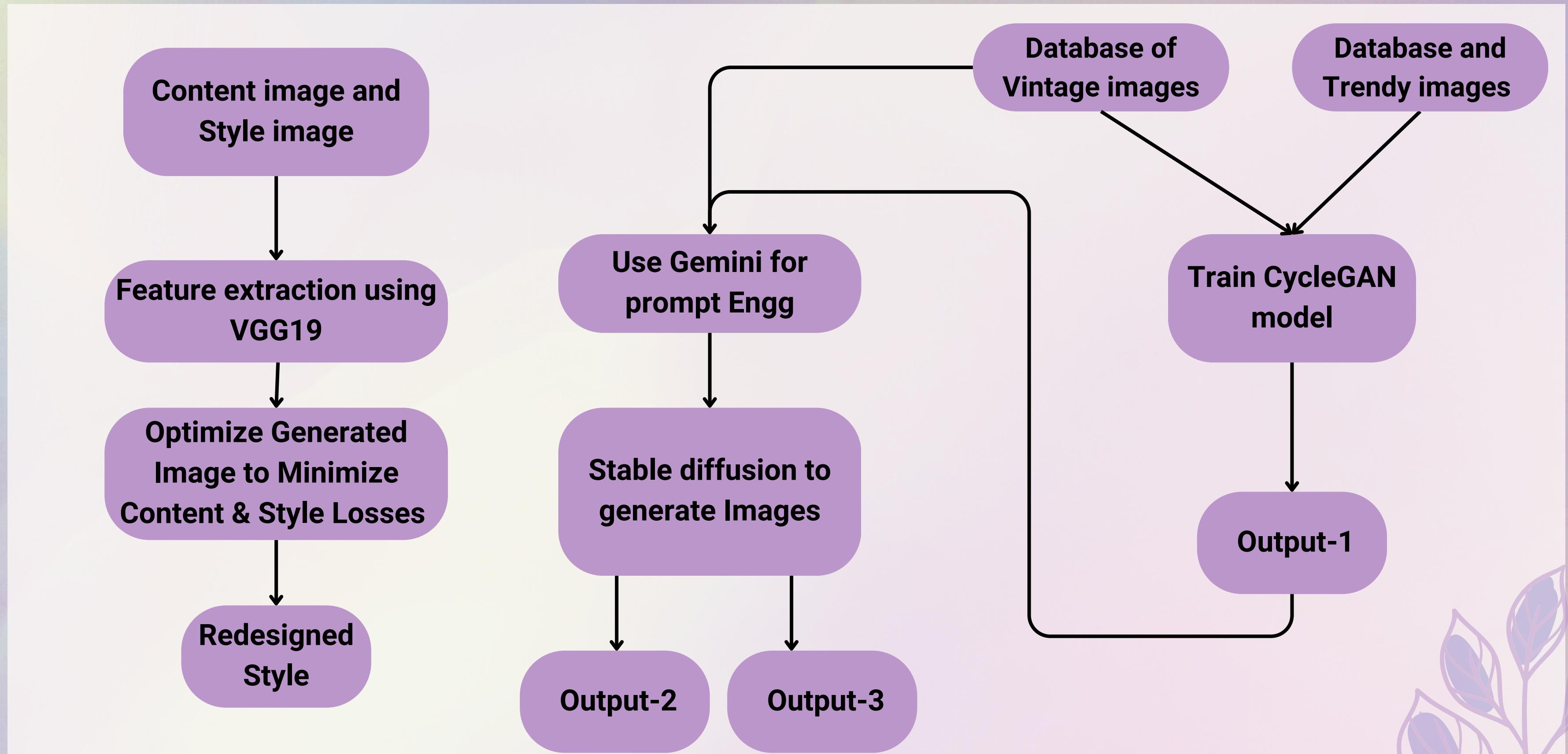
### 6. Optimization:

- Update the generated image iteratively using backpropagation and gradient descent to match both content and style constraints.

### 7. Final Output:

- Produce a new image that combines the content of the content image with the style of the style image.

# TREND GENERATION



# BUSINESS PERSPECTIVE

## Innovative Trend Generation:

- Fresh Styles: By transforming vintage styles into contemporary ones and vice versa, Myntra can offer unique and innovative fashion items that stand out in the market.
- Trend Relevance: The ability to generate new styles that appeal to current fashion trends can attract a broader customer base, including those interested in both retro and modern aesthetics.

## Enhanced Trend Analysis:

- Data-Driven Insights: The trend identification process will provide Myntra with data-driven insights into emerging fashion trends. This can help Myntra stay ahead of competitors by anticipating and adapting to changing consumer preferences.
- Better Inventory Management: Understanding trends over time allows Myntra to optimize inventory and marketing strategies, ensuring they stock and promote items that are in demand.



# BUSINESS PERSPECTIVE

## Improved Personalization:

- Tailored Recommendations: The generated fashion trends can be used to create personalized shopping experiences for customers, offering them recommendations based on their style preferences and trends.

## Creative Design Opportunities:

- Unique Accessories: The style transfer technique can lead to innovative accessory designs, adding a new dimension to Myntra's product offerings and potentially creating buzz in the fashion industry.

## Increased Customer Engagement:

- Interactive Experiences: Implementing these advanced techniques could lead to interactive and engaging shopping experiences, such as virtual try-ons or personalized fashion recommendations, enhancing overall customer satisfaction

# BUSINESS MODEL

|  |  |   |  |   |
|--|--|---|--|---|
| <b>KEY PARTNERS</b> <ul style="list-style-type: none"><li>• Designers and Brands</li><li>• Technology Providers</li><li>• Media Agencies</li></ul> | <b>KEY ACTIVITIES</b> <ul style="list-style-type: none"><li>• Trend research and Analysis</li><li>• Product development</li><li>• Customer relationships</li></ul> | <b>VALUE PROPOSITIONS</b> <ul style="list-style-type: none"><li>• Trend-Forward fashion</li><li>• Innovative design Solutions</li><li>• Consideration from users in deciding trends</li></ul> | <b>CUSTOMER RELATIONSHIPS</b> <ul style="list-style-type: none"><li>• Loyalty</li><li>• Sustainability</li><li>• Transparency</li></ul>                  | <b>CUSTOMER SEGMENTS</b> <ul style="list-style-type: none"><li>• Fashion Designers</li><li>• Trend analysts</li><li>• Fashion enthusiasts</li></ul> |
| <b>KEY RESOURCES</b> <ul style="list-style-type: none"><li>• Human resources</li><li>• Technology</li><li>• Partnership</li></ul>                  | <b>CHANNELS</b> <ul style="list-style-type: none"><li>• Online Platform</li><li>• Fashion shows</li><li>• Social media</li></ul>                                   | <b>COST STRUCTURE</b> <ul style="list-style-type: none"><li>• Marketing</li><li>• Advertising</li><li>• AI tools</li><li>• Data Analytics</li></ul>   | <b>REVENUE STREAMS</b> <ul style="list-style-type: none"><li>• Design sales</li><li>• Customization sales</li><li>• Sponsorships and workshops</li></ul> |   |

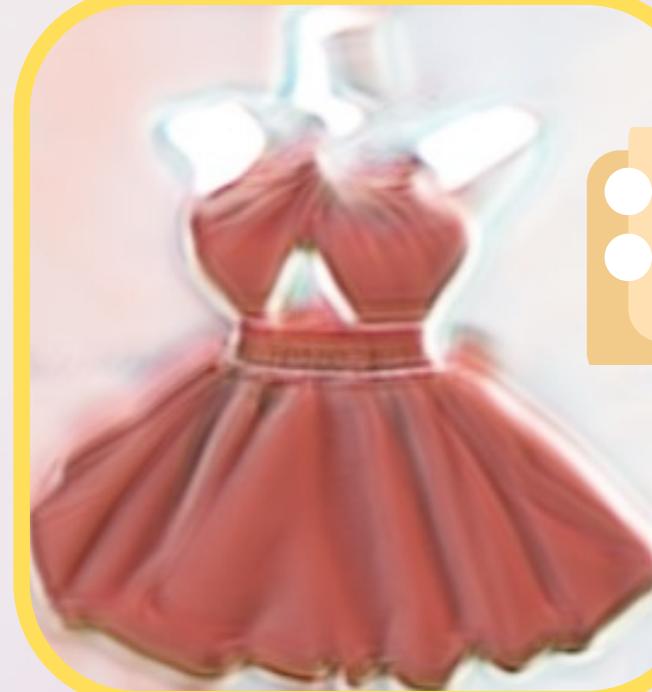
# OUTPUTS



- A vintage-inspired frock featuring pleats and a bow, in a trendy, subtle purple shade beloved by Gen Z



- A white t-shirt or frock layered with a single lace satin party wear top, reminiscent of the iconic DDLJ dress.



- A vibrant red full-frill short frock, inspired by classic dancers, features a trendy triangular cutout and modern cross-neck pattern



- A vintage-inspired oversized brown blazer, capturing both classic charm and modern trendiness

# OUTPUTS



# FUTURE WORKS

## Enhancing Dataset Size:

1. Expand fashion image collections for greater variety.
2. Include diverse fashion genres and cultural backgrounds.

## Utilizing High-End GPUs:

1. Accelerate training and inference for faster outputs.
2. Improve model performance with advanced GPU capabilities.

## Incorporating Additional AI Techniques:

1. Explore transformer models for better trend understanding.
2. Experiment with multi-modal models (text and image) for richer results.

## Implementing Real-Time Analytics:

1. Develop real-time trend analysis systems for up-to-date insights.
2. Enhance dynamic personalization based on user interactions.



## FUTURE WORKS

### Improving User Experience:

1. Integrate advanced virtual try-ons with high-resolution images.
2. Create interactive tools for visualizing fashion trends.

### Collaborating with Industry Experts:

1. Partner with fashion designers for model refinement.
2. Engage with fashion influencers for trend validation and feedback.