Summary

1. Chosen Model: Convolutional Neural Network (CNN)

Architecture:

- Input Layer: Accepts images of size (128, 128, 3).
- Convolutional Layer: 32 filters with a kernel size of (3, 3) and ReLU activation.
- Max Pooling Layer: Reduces spatial dimensions.
- Flatten Layer: Converts the 2D matrix data to a vector.
- Dense Layers: Two dense layers with ReLU activation, one with dropout (0.1), and one with softmax activation for multi-class classification.

Compilation:

- Utilizes the Adam optimizer and sparse categorical crossentropy loss.

2. Training Process:

Data Loading and Preprocessing:

- Reads and preprocesses images from a specified directory, creating a dataset with corresponding labels.
- Resizes images to (128, 128) pixels and normalizes pixel values.

Data Splitting:

- Splits the dataset into training and testing sets (70% training, 30% testing).

Model Training:

- Trains the model for 200 epochs with a batch size of 128.
- Utilizes a validation split of 10% to monitor model performance during training.

Visualizations:

- Plots and saves accuracy and loss over epochs for both training and validation sets.
- Facilitates analysis of the model's learning progress and identification of potential overfitting.

3. Critical Findings:

Accuracy and Loss Plots:

- The accuracy plot shows the model's improvement over epochs on both training and validation sets.
- The loss plot indicates the convergence of the model during training, providing insights into its generalization capabilities.

Model Evaluation:

- Evaluates the trained model on a separate test set.
- Obtains and prints the accuracy of the model on the test data.

Example Predictions:

- Demonstrates the model's capability to predict celebrities from specific images.
- Offers a qualitative assessment of the model's performance on real-world data.
- Some prediction may be wrong because the train set has false pictures in some folder.

Conclusion:

The CNN model that was selected shows promise in identifying celebrities. Crucial discoveries, including accuracy and loss graphs, direct our comprehension of the learning dynamics of the model. A test set evaluation and sample forecasts offer important insights into how well it performs in real-world scenarios. Based on these important discoveries, further optimisation and refinement may be taken into consideration to improve the accuracy and resilience of the model.