**1. Explain the concept of transfer learning. How does it differ from training a model from scratch?**

* Involves using a pre-trained model (trained on a large, general dataset) as a starting point for a new, typically smaller task.
* Saves training time and often achieves better results because the model already learned useful feature representations.
* Differs from training from scratch, where the model starts with randomly initialized weights and must learn all features anew.

**2. What is fine-tuning in the context of transfer learning, and why is it useful?**

* Adjusts (unfreezes) some or all layers of the pre-trained model for the new task.
* Allows the model to adapt learned features to better fit the target dataset.
* Useful because it often boosts performance by fine-tuning high-level representations for the specific problem.

**3. Why is it important to freeze the convolutional base during feature extraction?**

* Prevents altering low-level feature extraction layers that are already effective at capturing general patterns.
* Speeds up training and avoids catastrophic forgetting of robust, pre-learned features.
* Focuses training on higher-level layers, which adapt to the new task.

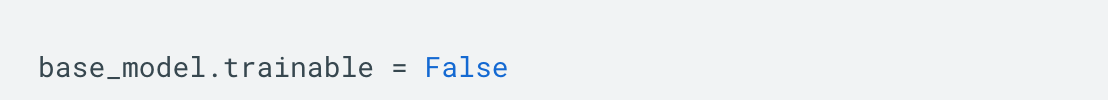
**4. Why use data augmentation?**

* Creates more varied training samples (e.g., through rotation, flip, zoom) without collecting more data.
* Improves model generalization and robustness by exposing it to diverse examples.
* Reduces overfitting by ensuring the model does not memorize specific training images.

**A screenshot of a computer

Description automatically generated5. Take a screenshot of the code snippet where the pre-trained MobileNetV2 model is loaded without the top classification layers.**

**6. Take a screenshot of the portion of code where the pre-trained model is set to be non-trainable for feature extraction purposes.**

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7. Take a screenshot of the data augmentation layers defined in the model.**

**A close up of text

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8. Take a screenshot of the code that shows the addition of the new classifier layers on top of the base model.**

A screenshot of a computer program

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