Transfer Learning Cheatsheet
**Small dataset**
- Similar images
  1. Remove end of the NN
  2. Add a FC layer that matches my # of classes.
  3. Randomize weights of FC and freeze the pre-trained weights.
  4. Train to update FC weights.
*why freeze the pretrained model? avoiding overfitting.*

**Large dataset**
- Similar images
  1. Remove the last FC in the pretrained model.
  2. Replace it with a layer that matches my # classes.
  3. Randomly init FC weights.
  4. Use the pretrained model to initialize the rest of weights.
  5. Retrain the whole thing.

**Small dataset**
- Different images
  1. Only keep some of the first few layers in the pretrained model.
  2. Add a FC network that matches my # of classes.
  3. Randomize FC weights and freeze layers from pretrained one.
  4. Train to update weights of FC.
*why freeze the pretrained model? avoiding overfitting*

**Large dataset**
- Different images
  1. Remove the last FC from the pretrained network.
  2. Replace it with a new FC that matches your # classes.
  3. Retrain the whole network from scratch with random init weights.
  Alternatively, one can do the approach on the left. Initializing weights with pretrained model may speed up training.