The assigned original project focused on leveraging the fastai library, a Python deep learning framework built on PyTorch, for the classification of breast histopathology images. The Kaggle dataset utilized contained over 400,000 images categorized into class 0 (healthy tissues) and class 1 (diseased). To handle this data, loading procedures considered validation percentages, defined augmentation criteria, and established an ImageDataBunch. A transfer learning strategy was adopted, employing a pre-trained ResNet18 Convolutional Neural Network from the ImageNet database. Fine-tuning involved adjusting the weights of the last layers along with the learning rate parameter, resulting in an impressive 89% accuracy. The project showcased the efficacy of transfer learning and data augmentation but faced limitations, including an outdated fastai library version, interpretability challenges due to Fastai's high-level abstractions, class distribution imbalance, and absence of a dedicated test set, raising concerns about model generalization.

To address these limitations, the current project endeavours to:

1. Transition from fastai to Keras for building, training, and deploying the neural network.
2. Mitigate class imbalance by introducing weights that prioritize accurate classification of class 1.
3. Allocate 15% of the dataset for comprehensive testing, adjusting the training-evaluating-test set percentages to 70-15-15%.
4. Explore the potential advantages of ResNet50 over ResNet18 and compare their performances with a transfer learning model built upon Efficient Net, as covered in theoretical lessons.

Additionally, efforts were made to replicate the learning rate parameter tuning, previously handled by a fastai built-in function, by evaluating a grid of values. The chosen learning rate, minimizing the loss, was compared with results obtained without tuning to assess the functionality's effectiveness.

**(aggiungere results – abbiamo circa 40 parole)**