Report 2: Experiments reproducing

As a final iteration of the work on the project, reproductions of the main experiments of the article were carried out:

- CNN model on split CIFAR-10 (IID)
- CNN model on FEMINIST (non IID)
- GRU model on Shakespeare (non IID)

As a result, we can say that the optimizations discussed in the article really improve the performance of distributed systems. But they show better performance under certain limitations of the model architecture.

Although the article reflects the versatility of the optimizations used, based on the results of the analysis, we can say that the modifications considered show themselves best on CNN models. As, in turn, optimization shows itself less effectively using the example of language models.

As additional developments, a method not reproducible as an experiment in the article was considered - D meta optimization. The method theoretically shows that the result of finding the optimum can be achieved better if parts of distributed systems are "superimposed" on each other with a certain percentage. The correctness of the conclusion of such optimization, which leads to improved performance, has been tested in practice: