

Software Requirements for Federated Learning Program

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1. Python Version:

- Python 3.8 or higher

2. Python Libraries:

- pandas: Data manipulation and analysis

Command: `pip install pandas`

- numpy: Numerical computing library

Command: `pip install numpy`

- torch (PyTorch): Deep learning framework

Command: `pip install torch`

- torchvision (optional, but recommended)

Command: `pip install torchvision`

- opacus: PyTorch library for differential privacy

Command: `pip install opacus`

- scikit-learn: Data preprocessing and scaling

Command: `pip install scikit-learn`

3. Hardware Requirements:

- CPU: Intel/AMD processor with AVX support
- RAM: Minimum 4GB (8GB recommended for larger datasets)
- GPU (Optional but recommended): NVIDIA GPU with CUDA support (CUDA 11.7 or later)

- CUDA Toolkit (if using GPU)

Command: `conda install cudatoolkit=11.7`

- cuDNN (if using GPU): Download compatible version

4. Operating System:

- Windows 10/11
- Ubuntu 18.04 or later
- macOS (ARM-based Macs may require additional configurations)

5. IDE/Editor (Optional):

- Visual Studio Code, PyCharm, Jupyter Notebook, or any text editor with Python support.