The following steps are needed to set up QML software on Ubuntu 22.04-24.04 LTS

These instructions install Python 3.11, PennyLane 0.42.3, PyTorch 2.8.0, and other required Python packages for CPU execution only. Any changes to these versions will need testing.

Step 1. Install Python 3.11 if needed (optionally with "deadsnakes")

- Check what version of Python you have on your system. If it is version 3.11 you can go to Step 2. If you use a recent Linux installation, you are likely to have Python 3.12 or higher.
  $ python --version *Your output may look like this:*
  Python 3.12.x

- To ensure that all course participants have an identical installation, we will use Python 3.11. This means your Linux will need to use multiple versions of Python installed in parallel, which is possible using an application "deadsnakes". To install it, first register its repository and then install it using the following commands:
  $ sudo apt update & sudo apt upgrade -y
  $ sudo add-apt-repository ppa:deadsnakes/ppa
  $ sudo apt update

- Now install Python 3.11, its virtual environment packages, and test your installation:
  $ sudo apt install python3.11
  $ sudo apt install python3.11-venv
  $ python3.11 –version *Your output should look similar to this:*
  Python 3.11.x

Step 2. Installing a Python virtual environment (venv)

- If you have Python 3.11 (in fact 3.3 or later) you will be able to create a virtual environment. Create a container directory "~/venv" to hold different Python virtual environments, such as PennyLane with CPU or GPU support, Qiskit, Cirq or Julia with Yao.
  $ mkdir ~/venv

- In the "venv", we will create an environment for CPU-based PennyLane and call it "pl".
  $ cd ~/venv
  $ python3.11 -m venv pl

- To use the "pl" environment, we need to activate it - to be done in any PennyLane project.
  $ source ~/venv/pl/bin/activate

- Now we can check which Python is active (different from a global default)
  (pl) $ which python *Your output should be similar to this:*
  /home/yourusername/venv/pl/bin/python

- The environment will be active until you use the command "deactivate".

Step 3. Setup your PennyLane+PyTorch virtual Python environment (for QML workshop)

- Download the "requirements.txt" file and leave it in "~/Downloads". This file includes names of packages such as: PennyLane, PyTorch, ML software, Jupyter and data sources.

- While the "pl" environment is active, install all Python packages, with their versions as specified in the "requirements.txt" file:
  (pl) $ pip install -r ~/Downloads/requirements.txt

Step 4. Create a project directory and start Jupyter Lab or Jupyter Notebook

- Create a workshop directory, e.g. "~/workshop", go there, and start jupyter:
  (pl) $ mkdir ~/workshop
  (pl) $ cd ~/workshop
  (pl) $ jupyter lab