lab0

July 25, 2025

```
[1]: %pip install "qc-grader[qiskit,jupyter] @ git+https://github.com/
     ↪qiskit-community/Quantum-Challenge-Grader.git"
```

Collecting qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git (from qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git)
  Cloning https://github.com/qiskit-community/Quantum-Challenge-Grader.git to
/tmp/pip-install-oqjdwnyq/qc-grader_ac6b8809a3cb4303bc1571947ecf48d2
  Running command git clone --filter=blob:none --quiet
https://github.com/qiskit-community/Quantum-Challenge-Grader.git /tmp/pip-
install-oqjdwnyq/qc-grader_ac6b8809a3cb4303bc1571947ecf48d2
  Resolved https://github.com/qiskit-community/Quantum-Challenge-Grader.git to
commit 897f4448b14d18b4d0a430f57f11c2dcb6200c20
  Preparing metadata (setup.py) … done
Requirement already satisfied: typeguard in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (4.4.4)
Requirement already satisfied: jsonpickle==3.0.3 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (3.0.3)
Requirement already satisfied: requests==2.32.3 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (2.32.3)
Requirement already satisfied: ipycytoscape in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (1.3.3)
Requirement already satisfied: plotly in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-

community/Quantum-Challenge-Grader.git) (6.2.0)
Requirement already satisfied: networkx==3.2.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (3.2.1)
Requirement already satisfied: graphviz in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (0.21)
Requirement already satisfied: ibm-platform-services==0.66.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (0.66.1)
Requirement already satisfied: jupyterlab in /opt/conda/lib/python3.11/site-
packages (from qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (4.2.0)
Requirement already satisfied: ipykernel in /opt/conda/lib/python3.11/site-
packages (from qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (6.29.3)
Requirement already satisfied: qiskit~=2.1.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.1.0)
Requirement already satisfied: qiskit-ibm-runtime in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (0.40.1)
Requirement already satisfied: qiskit-aer in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (0.17.1)
Requirement already satisfied: ibm_cloud_sdk_core<4.0.0,>=3.24.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ibm-platform-services==0.66.1->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (3.24.1)
Requirement already satisfied: charset-normalizer<4,>=2 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
requests==2.32.3->qc-grader@ git+https://github.com/qiskit-community/Quantum-

Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (3.4.2)
Requirement already satisfied: idna<4,>=2.5 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
requests==2.32.3->qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
requests==2.32.3->qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (2.5.0)
Requirement already satisfied: certifi>=2017.4.17 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
requests==2.32.3->qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (2025.6.15)
Requirement already satisfied: python_dateutil<3.0.0,>=2.8.2 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ibm_cloud_sdk_core<4.0.0,>=3.24.1->ibm-platform-services==0.66.1->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.9.0.post0)
Requirement already satisfied: PyJWT<3.0.0,>=2.8.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ibm_cloud_sdk_core<4.0.0,>=3.24.1->ibm-platform-services==0.66.1->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.10.1)
Requirement already satisfied: six>=1.5 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
python_dateutil<3.0.0,>=2.8.2->ibm_cloud_sdk_core<4.0.0,>=3.24.1->ibm-platform-
services==0.66.1->qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (1.17.0)
Requirement already satisfied: rustworkx>=0.15.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit~=2.1.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.16.0)
Requirement already satisfied: numpy<3,>=1.17 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit~=2.1.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.3.1)
Requirement already satisfied: scipy>=1.5 in

/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit~=2.1.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (1.16.0)
Requirement already satisfied: dill>=0.3 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit~=2.1.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.4.0)
Requirement already satisfied: stevedore>=3.0.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit~=2.1.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (5.4.1)
Requirement already satisfied: typing-extensions in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit~=2.1.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (4.14.1)
Requirement already satisfied: matplotlib>=3.3 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (3.10.3)
Requirement already satisfied: pydot in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (4.0.1)
Requirement already satisfied: Pillow>=4.2.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (11.3.0)
Requirement already satisfied: pylatexenc>=1.4 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.10)
Requirement already satisfied: seaborn>=0.9.0 in

/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.13.2)
Requirement already satisfied: sympy>=1.3 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (1.14.0)
Requirement already satisfied: contourpy>=1.0.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
matplotlib>=3.3->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (1.3.2)
Requirement already satisfied: cycler>=0.10 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
matplotlib>=3.3->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
matplotlib>=3.3->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (4.58.5)
Requirement already satisfied: kiwisolver>=1.3.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
matplotlib>=3.3->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (1.4.8)
Requirement already satisfied: packaging>=20.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
matplotlib>=3.3->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (25.0)
Requirement already satisfied: pyparsing>=2.3.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
matplotlib>=3.3->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (3.2.3)
Requirement already satisfied: pandas>=1.2 in

/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from seaborn>=0.9.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2.3.0)
Requirement already satisfied: pytz>=2020.1 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from pandas>=1.2->seaborn>=0.9.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from pandas>=1.2->seaborn>=0.9.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2025.2)
Requirement already satisfied: pbr>=2.0.0 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from stevedore>=3.0.0->qiskit~=2.1.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (6.1.1)
Requirement already satisfied: setuptools in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from pbr>=2.0.0->stevedore>=3.0.0->qiskit~=2.1.0->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (65.5.0)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from sympy>=1.3->qiskit[visualization]~=2.1.0; extra == "qiskit"->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.3.0)
Requirement already satisfied: ipywidgets>=7.6.0 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from ipycytoscape->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (8.1.7)
Requirement already satisfied: spectate>=1.0.0 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from ipycytoscape->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.0.1)
Requirement already satisfied: comm>=0.1.3 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from ipywidgets>=7.6.0->ipycytoscape->qc-grader@ git+https://github.com/qiskit-

community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.2.2)
Requirement already satisfied: ipython>=6.1.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipywidgets>=7.6.0->ipycytoscape->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (9.4.0)
Requirement already satisfied: traitlets>=4.3.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipywidgets>=7.6.0->ipycytoscape->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (5.14.3)
Requirement already satisfied: widgetsnbextension~=4.0.14 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipywidgets>=7.6.0->ipycytoscape->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (4.0.14)
Requirement already satisfied: jupyterlab_widgets~=3.0.15 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipywidgets>=7.6.0->ipycytoscape->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (3.0.15)
Requirement already satisfied: decorator in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (5.2.1)
Requirement already satisfied: ipython-pygments-lexers in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (1.1.1)
Requirement already satisfied: jedi>=0.16 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.19.2)
Requirement already satisfied: matplotlib-inline in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.1.7)
Requirement already satisfied: pexpect>4.3 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from

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ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (4.9.0)
Requirement already satisfied: prompt_toolkit<3.1.0,>=3.0.41 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (3.0.51)
Requirement already satisfied: pygments>=2.4.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.19.2)
Requirement already satisfied: stack_data in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.6.3)
Requirement already satisfied: wcwidth in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from p
rompt_toolkit<3.1.0,>=3.0.41->ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape-
>qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (0.2.13)
Requirement already satisfied: parso<0.9.0,>=0.8.4 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
jedi>=0.16->ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.8.4)
Requirement already satisfied: ptyprocess>=0.5 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
pexpect>4.3->ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.7.0)
Requirement already satisfied: debugpy>=1.6.5 in /opt/conda/lib/python3.11/site-
packages (from ipykernel->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.8.1)
Requirement already satisfied: jupyter-client>=6.1.12 in
/opt/conda/lib/python3.11/site-packages (from ipykernel->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
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Challenge-Grader.git) (8.6.1)
Requirement already satisfied: jupyter-core!=5.0.*,>=4.12 in
/opt/conda/lib/python3.11/site-packages (from ipykernel->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (5.7.2)
Requirement already satisfied: nest-asyncio in /opt/conda/lib/python3.11/site-
packages (from ipykernel->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.6.0)
Requirement already satisfied: psutil in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
ipykernel->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (7.0.0)
Requirement already satisfied: pyzmq>=24 in /opt/conda/lib/python3.11/site-
packages (from ipykernel->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (26.0.3)
Requirement already satisfied: tornado>=6.1 in /opt/conda/lib/python3.11/site-
packages (from ipykernel->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (6.4)
Requirement already satisfied: platformdirs>=2.5 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
core!=5.0.*,>=4.12->ipykernel->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (4.2.2)
Requirement already satisfied: async-lru>=1.0.0 in
/opt/conda/lib/python3.11/site-packages (from jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.0.4)
Requirement already satisfied: httpx>=0.25.0 in /opt/conda/lib/python3.11/site-
packages (from jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.27.0)
Requirement already satisfied: jinja2>=3.0.3 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (3.1.6)
Requirement already satisfied: jupyter-lsp>=2.0.0 in
/opt/conda/lib/python3.11/site-packages (from jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.2.5)
Requirement already satisfied: jupyter-server<3,>=2.4.0 in

/opt/conda/lib/python3.11/site-packages (from jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.14.0)
Requirement already satisfied: jupyterlab-server<3,>=2.27.1 in
/opt/conda/lib/python3.11/site-packages (from jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.27.1)
Requirement already satisfied: notebook-shim>=0.2 in
/opt/conda/lib/python3.11/site-packages (from jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.2.4)
Requirement already satisfied: anyio>=3.1.0 in /opt/conda/lib/python3.11/site-
packages (from jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (4.3.0)
Requirement already satisfied: argon2-cffi>=21.1 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (23.1.0)
Requirement already satisfied: jupyter-events>=0.9.0 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.10.0)
Requirement already satisfied: jupyter-server-terminals>=0.4.4 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.5.3)
Requirement already satisfied: nbconvert>=6.4.4 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (7.16.4)
Requirement already satisfied: nbformat>=5.3.0 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (5.10.4)
Requirement already satisfied: overrides>=5.0 in /opt/conda/lib/python3.11/site-
packages (from jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-

Challenge-Grader.git) (7.7.0)
Requirement already satisfied: prometheus-client>=0.9 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.20.0)
Requirement already satisfied: send2trash>=1.8.2 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.8.3)
Requirement already satisfied: terminado>=0.8.3 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.18.1)
Requirement already satisfied: websocket-client>=1.7 in
/opt/conda/lib/python3.11/site-packages (from jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.8.0)
Requirement already satisfied: babel>=2.10 in /opt/conda/lib/python3.11/site-
packages (from jupyterlab-server<3,>=2.27.1->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.14.0)
Requirement already satisfied: json5>=0.9.0 in /opt/conda/lib/python3.11/site-
packages (from jupyterlab-server<3,>=2.27.1->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.9.25)
Requirement already satisfied: jsonschema>=4.18.0 in
/opt/conda/lib/python3.11/site-packages (from jupyterlab-
server<3,>=2.27.1->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (4.22.0)
Requirement already satisfied: sniffio>=1.1 in /opt/conda/lib/python3.11/site-
packages (from anyio>=3.1.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (1.3.1)
Requirement already satisfied: argon2-cffi-bindings in
/opt/conda/lib/python3.11/site-packages (from argon2-cffi>=21.1->jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (21.2.0)
Requirement already satisfied: httpcore==1.* in /opt/conda/lib/python3.11/site-
packages (from httpx>=0.25.0->jupyterlab->qc-grader@

git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.0.5)
Requirement already satisfied: h11<0.15,>=0.13 in /opt/conda/lib/python3.11/site-packages (from httpcore==1.*->httpx>=0.25.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.14.0)
Requirement already satisfied: MarkupSafe>=2.0 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from jinja2>=3.0.3->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (3.0.2)
Requirement already satisfied: attrs>=22.2.0 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=4.18.0->jupyterlab-server<3,>=2.27.1->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (23.2.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=4.18.0->jupyterlab-server<3,>=2.27.1->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2023.12.1)
Requirement already satisfied: referencing>=0.28.4 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=4.18.0->jupyterlab-server<3,>=2.27.1->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.35.1)
Requirement already satisfied: rpds-py>=0.7.1 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=4.18.0->jupyterlab-server<3,>=2.27.1->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.18.1)
Requirement already satisfied: python-json-logger>=2.0.4 in /opt/conda/lib/python3.11/site-packages (from jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2.0.7)
Requirement already satisfied: pyyaml>=5.3 in /opt/conda/lib/python3.11/site-packages (from jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (6.0.1)
Requirement already satisfied: rfc3339-validator in /opt/conda/lib/python3.11/site-packages (from jupyter-events>=0.9.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-

community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.1.4)
Requirement already satisfied: rfc3986-validator>=0.1.1 in
/opt/conda/lib/python3.11/site-packages (from jupyter-events>=0.9.0->jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.1.1)
Requirement already satisfied: fqdn in /opt/conda/lib/python3.11/site-packages
(from jsonschema[format-nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.5.1)
Requirement already satisfied: isoduration in /opt/conda/lib/python3.11/site-
packages (from jsonschema[format-nongpl]>=4.18.0->jupyter-
events>=0.9.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (20.11.0)
Requirement already satisfied: jsonpointer>1.13 in
/opt/conda/lib/python3.11/site-packages (from jsonschema[format-
nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2.4)
Requirement already satisfied: uri-template in /opt/conda/lib/python3.11/site-
packages (from jsonschema[format-nongpl]>=4.18.0->jupyter-
events>=0.9.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (1.3.0)
Requirement already satisfied: webcolors>=1.11 in
/opt/conda/lib/python3.11/site-packages (from jsonschema[format-
nongpl]>=4.18.0->jupyter-events>=0.9.0->jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.13)
Requirement already satisfied: beautifulsoup4 in /opt/conda/lib/python3.11/site-
packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-
grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (4.12.3)
Requirement already satisfied: bleach!=5.0.0 in /opt/conda/lib/python3.11/site-
packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-
grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (6.1.0)
Requirement already satisfied: defusedxml in /opt/conda/lib/python3.11/site-
packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-

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grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.7.1)
Requirement already satisfied: jupyterlab-pygments in /opt/conda/lib/python3.11/site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.3.0)
Requirement already satisfied: mistune<4,>=2.0.3 in /opt/conda/lib/python3.11/site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (3.0.2)
Requirement already satisfied: nbclient>=0.5.0 in /opt/conda/lib/python3.11/site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.10.0)
Requirement already satisfied: pandocfilters>=1.4.1 in /opt/conda/lib/python3.11/site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.5.0)
Requirement already satisfied: tinycss2 in /opt/conda/lib/python3.11/site-packages (from nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.3.0)
Requirement already satisfied: webencodings in /opt/conda/lib/python3.11/site-packages (from bleach!=5.0.0->nbconvert>=6.4.4->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.5.1)
Requirement already satisfied: fastjsonschema>=2.15 in /opt/conda/lib/python3.11/site-packages (from nbformat>=5.3.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2.19.1)
Requirement already satisfied: cffi>=1.0.1 in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from argon2-cffi-bindings->argon2-cffi>=21.1->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (1.17.1)
Requirement already satisfied: pycparser in /opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from cffi>=1.0.1->argon2-cffi-bindings->argon2-cffi>=21.1->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-

community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2.22)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-
packages (from beautifulsoup4->nbconvert>=6.4.4->jupyter-
server<3,>=2.4.0->jupyterlab->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2.5)
Requirement already satisfied: arrow>=0.15.0 in /opt/conda/lib/python3.11/site-
packages (from isoduration->jsonschema[format-nongpl]>=4.18.0->jupyter-
events>=0.9.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (1.3.0)
Requirement already satisfied: types-python-dateutil>=2.8.10 in
/opt/conda/lib/python3.11/site-packages (from
arrow>=0.15.0->isoduration->jsonschema[format-nongpl]>=4.18.0->jupyter-
events>=0.9.0->jupyter-server<3,>=2.4.0->jupyterlab->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.9.0.20240316)
Requirement already satisfied: narwhals>=1.15.1 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
plotly->qc-grader@ git+https://github.com/qiskit-community/Quantum-Challenge-
Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (1.45.0)
Requirement already satisfied: requests-ntlm>=1.1.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit-ibm-runtime->qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (1.3.0)
Requirement already satisfied: pydantic>=2.5.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
qiskit-ibm-runtime->qc-grader@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git->qc-grader[jupyter,qiskit]@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git) (2.11.7)
Requirement already satisfied: annotated-types>=0.6.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
pydantic>=2.5.0->qiskit-ibm-runtime->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.7.0)
Requirement already satisfied: pydantic-core==2.33.2 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
pydantic>=2.5.0->qiskit-ibm-runtime->qc-grader@ git+https://github.com/qiskit-
community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (2.33.2)
Requirement already satisfied: typing-inspection>=0.4.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
pydantic>=2.5.0->qiskit-ibm-runtime->qc-grader@ git+https://github.com/qiskit-

community/Quantum-Challenge-Grader.git->qc-grader[jupyter,qiskit]@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git) (0.4.1)
Requirement already satisfied: cryptography>=1.3 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
requests-ntlm>=1.1.0->qiskit-ibm-runtime->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (45.0.5)
Requirement already satisfied: pyspnego>=0.4.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
requests-ntlm>=1.1.0->qiskit-ibm-runtime->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.11.2)
Requirement already satisfied: executing>=1.2.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
stack_data->ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (2.2.0)
Requirement already satisfied: asttokens>=2.1.0 in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
stack_data->ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (3.0.0)
Requirement already satisfied: pure-eval in
/opt/.qbraid/environments/qgss_000000/pyenv/lib/python3.11/site-packages (from
stack_data->ipython>=6.1.0->ipywidgets>=7.6.0->ipycytoscape->qc-grader@
git+https://github.com/qiskit-community/Quantum-Challenge-Grader.git->qc-
grader[jupyter,qiskit]@ git+https://github.com/qiskit-community/Quantum-
Challenge-Grader.git) (0.2.3)
Note: you may need to restart the kernel to use updated packages.
```

[2]:
```python
import qiskit
import qc_grader

print(f"Qiskit version: {qiskit.__version__}")
print(f"Grader version: {qc_grader.__version__}")
```

Qiskit version: 2.1.0
Grader version: 0.22.9

[3]:
```python
token = "opl3nCL0bFDik-1CqTdMZl4V5AVjdbsT-4BfJPln5t_l"
```

[4]:
```python
your_api_key = "xi0nZf18SfBZn-P1f124QEWDywbHVDPldD9sjHLkYjNE"
```

```
your_crn = "crn:v1:bluemix:public:quantum-computing:us-east:a/
  ↪28121048c51949f9a93006ccbc7b3faf:edce2be1-5f4f-4532-9d3d-72a7b8c6538d::"

from qiskit_ibm_runtime import QiskitRuntimeService

QiskitRuntimeService.save_account(
    channel="ibm_quantum_platform",
    token=your_api_key,
    instance=your_crn,
    name="qgss-2025",
    overwrite=True
)
```

[5]:
```
# Check that the account has been saved properly
service = QiskitRuntimeService(name="qgss-2025")
service.saved_accounts()
```

[5]: {'qgss-2025': {'channel': 'ibm_quantum_platform',
    'url': 'https://cloud.ibm.com',
    'token': 'xiOnZf18SfBZn-P1f124QEWDywbHVDPldD9sjHLkYjNE',
    'instance': 'crn:v1:bluemix:public:quantum-computing:us-
east:a/28121048c51949f9a93006ccbc7b3faf:edce2be1-5f4f-4532-9d3d-72a7b8c6538d::',
    'verify': True,
    'private_endpoint': False}}

[6]:
```
import matplotlib.pyplot as plt

from qiskit import QuantumCircuit, generate_preset_pass_manager
from qiskit.visualization import plot_histogram
from qiskit.quantum_info import SparsePauliOp

from qiskit_ibm_runtime import QiskitRuntimeService, SamplerV2 as Sampler,
  ↪EstimatorV2 as Estimator

from qiskit_aer import AerSimulator

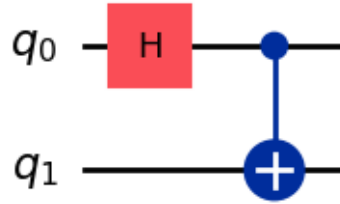from qc_grader.challenges.qgss_2025 import grade_lab0_ex1, grade_lab0_ex2
```

[7]:
```
# Create a new circuit with a single qubit
qc = QuantumCircuit(2)
# Add a H gate to qubit 0
qc.h(0)
# Add a CNOT gate to qubit 1
qc.cx(0, 1)
# Return a drawing of the circuit using MatPlotLib ("mpl").
qc.draw("mpl")
```

[7]:

```
[8]: from qiskit import QuantumCircuit
     from qiskit.visualization import matplotlib

     # Step 1: Create a new quantum circuit with 3 qubits
     qc = QuantumCircuit(3)
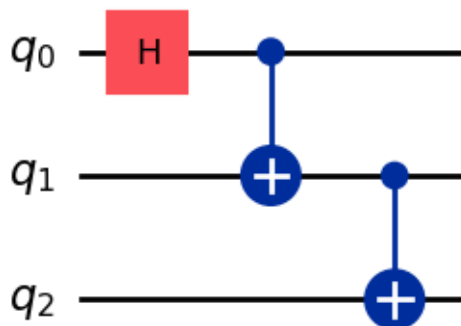
     # Step 2: Apply a Hadamard gate to qubit 0
     qc.h(0)

     # Step 3: Apply a CNOT gate from qubit 0 to qubit 1
     qc.cx(0, 1)

     # Step 4: Apply a CNOT gate from qubit 1 to qubit 2
     qc.cx(1, 2)

     # Step 5: Draw the circuit using matplotlib
     qc.draw("mpl")
```

[8]:

```
[9]:   # Submit your answer using following code
       from qc_grader.challenges.qgss_2025 import grade_lab0_ex1
```

```
[10]:  grade_lab0_ex1(qc)
```

Submitting your answer. Please wait…
Congratulations ! Your answer is correct and has been submitted.

```
[11]:  ### WRITE YOUR CODE BELOW HERE ###
       from qiskit.transpiler import CouplingMap
       from qiskit import transpile
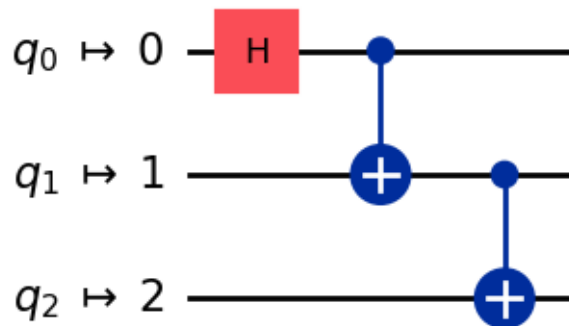
       # Define the bidirectional coupling map
       coupling_map = [[0, 1], [1, 0], [0, 2], [2, 0], [1, 2], [2, 1]]

       # Transpile the circuit using the defined coupling map
       qc_transpiled = transpile(qc, coupling_map=CouplingMap(coupling_map),␣
         ↪optimization_level=1)

       ### YOUR CODE FINISHES HERE ###

       # Draw the transpiled circuit
       qc_transpiled.draw("mpl")
```

[11]:


```
[12]:  grade_lab0_ex2(qc_transpiled)
```

Submitting your answer. Please wait…
Congratulations ! Your answer is correct and has been submitted.

```
[13]:  # Add measurement operations
       qc.measure_all()
```

```python
# Set up the backend
backend = AerSimulator()

# Set up the sampler
sampler = Sampler(mode=backend)

# Submit the circuit to Sampler
pm = generate_preset_pass_manager(backend=backend, optimization_level=1)
job = sampler.run(pm.run([qc]))

# Get the results
results_sampler = job.result()
```

```python
[14]: # Set up the Estimator
estimator = Estimator(mode=backend)

# Define some observables
ZZZ = SparsePauliOp("ZZZ")
ZZX = SparsePauliOp("ZZX")
ZII = SparsePauliOp("ZII")
XXI = SparsePauliOp("XXI")
ZZI = SparsePauliOp("ZZI")
III = SparsePauliOp("III")
observables = [ZZZ, ZZX, ZII, XXI, ZZI, III]

# Submit the circuit to Estimator
pub = (qc, observables)
job = estimator.run(pubs=[pub])

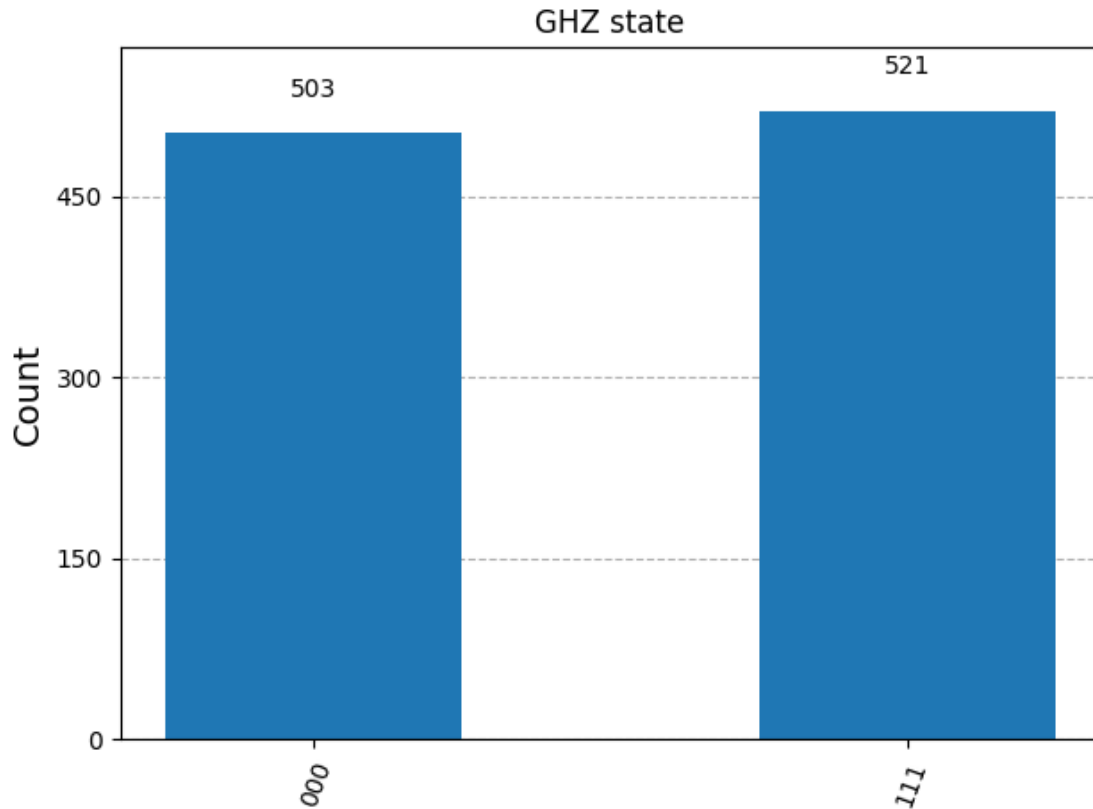# Get the results
results_estimator = job.result()
```

```python
[15]: counts_list = results_sampler[0].data.meas.get_counts()
print(f"  Outcomes : {counts_list}")
display(plot_histogram(counts_list, title="GHZ state"))
```

```
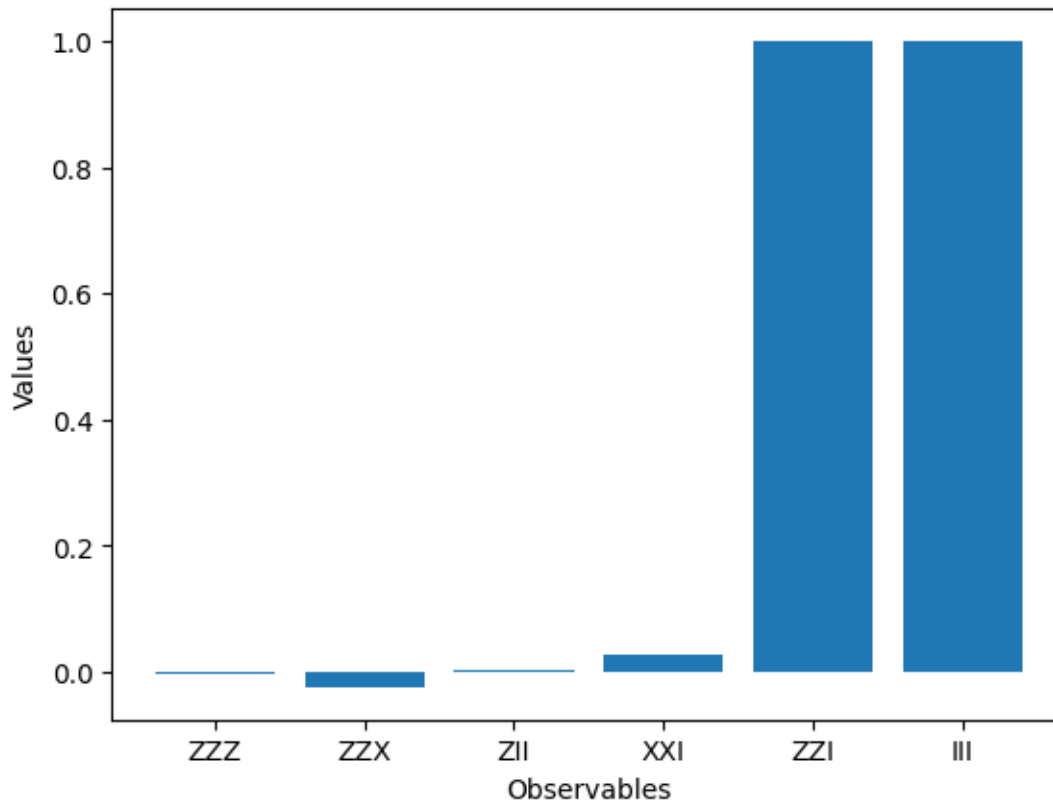Outcomes : {'000': 503, '111': 521}
```

GHZ state


```
[16]: exp_values = results_estimator[0].data.evs
      observables_list = ["ZZZ", "ZZX", "ZII", "XXI", "ZZI", "III"]
      print(f"Expectation values: {list(zip(observables_list, exp_values))}")

      # Set up our plot
      container = plt.bar(observables_list, exp_values, width=0.8)
      # Label each axis
      plt.xlabel("Observables")
      plt.ylabel("Values")
      plt.show()
```

Expectation values: [('ZZZ', np.float64(-0.00390625)), ('ZZX',
np.float64(-0.0244140625)), ('ZII', np.float64(0.00244140625)), ('XXI',
np.float64(0.02734375)), ('ZZI', np.float64(1.0)), ('III', np.float64(1.0))]

```
[17]: from qc_grader.grader.grade import check_lab_completion_status
      check_lab_completion_status("qgss_2025")
```

Lab 0: 2/2 exercises completed (100%)
     1215 participants have completed this lab
Lab 1: 0/9 exercises completed (0%)
     226 participants have completed this lab
Lab 2: 0/7 exercises completed (0%)
     1 participants have completed this lab
Lab 3: 0/5 exercises completed (0%)
     0 participants have completed this lab
Lab 4: 0/6 exercises completed (0%)
     0 participants have completed this lab

```
[ ]:
```