Installation Prerequisites for the Tutorial

1. First, you need to install Python on your device.
   (https://wiki.python.org/moin/BeginnersGuide/Download)

2. It is recommended that you create a separate virtual environment to run Qiskit.
   (https://docs.python.org/3.10/tutorial/venv.html)

3. Once you create the virtual environment to run Qiskit, activate the environment to install necessary packages.

4. Install Qiskit SDK using:

   pip install qiskit

   pip install qiskit-ibm-runtime

5. If you want to run a Jupyter notebook, you will need to install Jupyter in your environment as well.

   pip install jupyter

   and open your notebook with:

   jupyter notebook path/to/notebook.ipynb

6. You can also download and use VS Code (https://code.visualstudio.com/download)

7. You **need to create an IBM Quantum account** to access IBM Quantum backends and submit jobs in simulator. Get started here: https://docs.quantum.ibm.com/guides/setup-channel (for more details on setting up the account, see below)

8. Refer to **ISMB 2024 tutorial** here to get updated on requirements and exercises:
   https://github.com/IBM/qml4omics/tree/Tutorial_ISMB24

Instructions are compiled from the page (https://docs.quantum.ibm.com/start/install)

A detailed video instructions can be found here https://www.youtube.com/watch?v=dZWz4Gs_BuI

Set up an account in the IBM Quantum Platform

IBM offers access to quantum computers via open access plan.

Since we have already set up our environment for Qiskit and Qiskit Runtime, now we need to create an IBM Cloud account and follow the steps highlighted in the documentation (https://quantum.cloud.ibm.com/docs/en/guides/cloud-setup)

1. Create your IBM Cloud account if you do not have one (https://cloud.ibm.com/registration)

2. Create an instance if necessary and create an API key.

3. If you are in a trusted Python environment, you can save your account locally. Copy your API token and use/modify the code below to save your account:

```python
from qiskit_ibm_runtime import QiskitRuntimeService
service = QiskitRuntimeService.save_account(
  token=token, # Your token is confidential, paste your API token here
  instance="<IBM Cloud CRN or instance name>", # Optionally specify the instance to use.
  plans_preference="['plan-type1', 'plan-type2']", # Optionally set the types of plans to prioritize.  This is ignored if the instance is specified.
  region="<region>", # Optionally set the region to prioritize. This is ignored if the instance is specified.
  name="<account-name>", # Optionally name this set of account credentials.
  set_as_default=True, # Optionally set these as your default credentials.
)
```

4. Run your jobs on IBM Quantum computers now.

5. Test if the following the "Hello World" tutorial:
   https://quantum.cloud.ibm.com/docs/en/guides/hello-world