Educational Innovation Project UCM-UPM
Quantum Computing
Exercise 2: Starting with QISKIT

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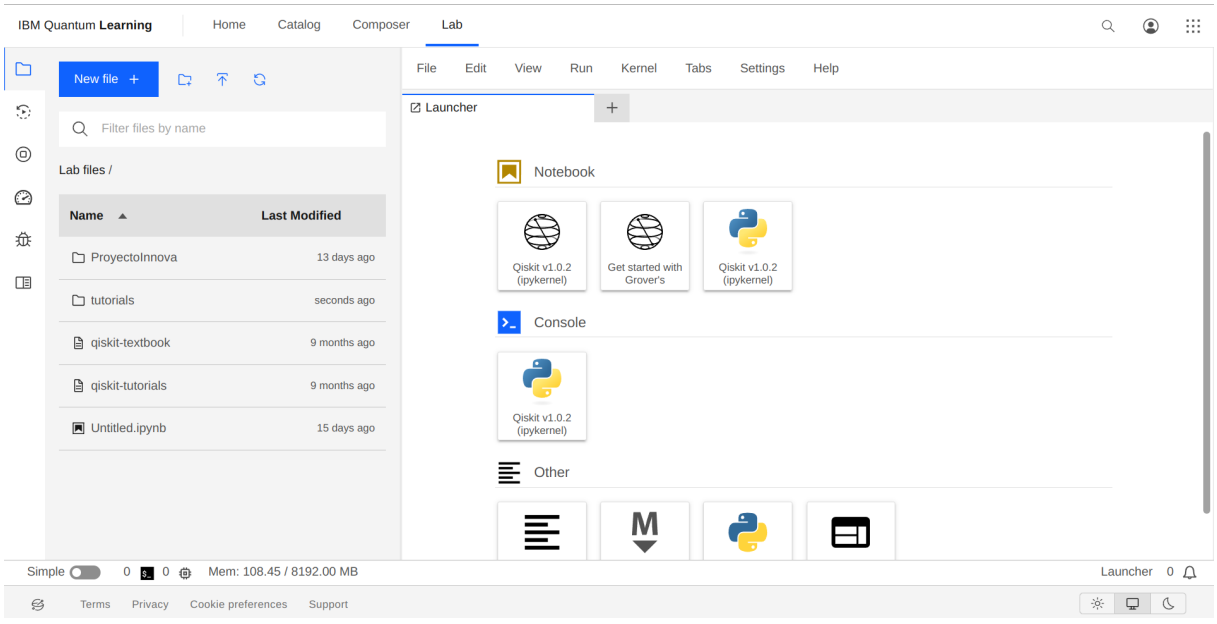
In this session you will move on from the graphical interface to a text-based programming language. You will still run on a classical computer simulating the quantum one, but now you will get acquainted with the IBM Qiskit package for quantum computer programming.

1 Create your account in IBM's Quantum Lab

1. Please open a web browser;
2. Type `https://quantum.ibm.com/lab` in the address bar to visit the page;
3. On your right side of the screen, click the link in `Create an IBMid` and follow the steps to create your identification with IBM.
4. Once created, login. You will see a message "your server is starting up" and after a few seconds[1] your browser tab should have the appearance of the following figure,



[1] Sometimes the IBM cloud computing system is saturated, so starting Jupyter servers on the IBM cloud for nonpaying users could be delayed from a couple of minutes up to even half an hour. If this happens, please be patient or use another option as described on the .

2 Load the python script into your IBM account

1. Enter the Moodle campus of this project and download the python script with the second exercise (a file named `QcRNG.ipynb`) to your local computer.
2. Upload this file into the quantum lab account you just created; the file will appear to hang from "labfiles" until you move it to a new folder.
3. Double click on it and it should open on the right hand side of the screen.

3 Proceed with the exercises

You will find two exercises: the first guides you through the generation of random numbers, the second through the quantum Fourier transform. The goal is that you familiarize yourself a bit with the Qiskit package. The format is that of a "Python notebook".

1. Advance through the notebook hitting `Shift+Enter` at each executable statement and note the output.
2. Write your observations and the answers to the proposed questions in a `.txt` basic text file which will constitute your hand-in.