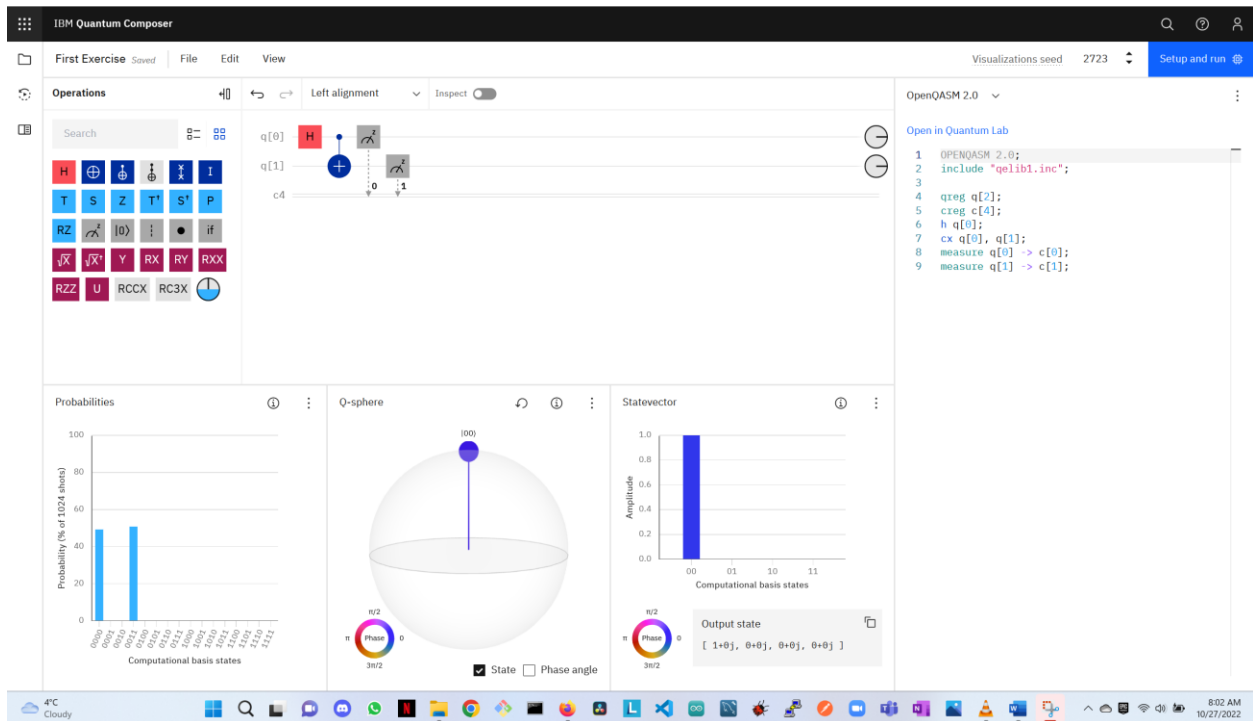


Haritha Weerathunga Arachchige

Week 1. Introduction to IBM Quantum environment [DUE 27.10.2022 at 11:00am]

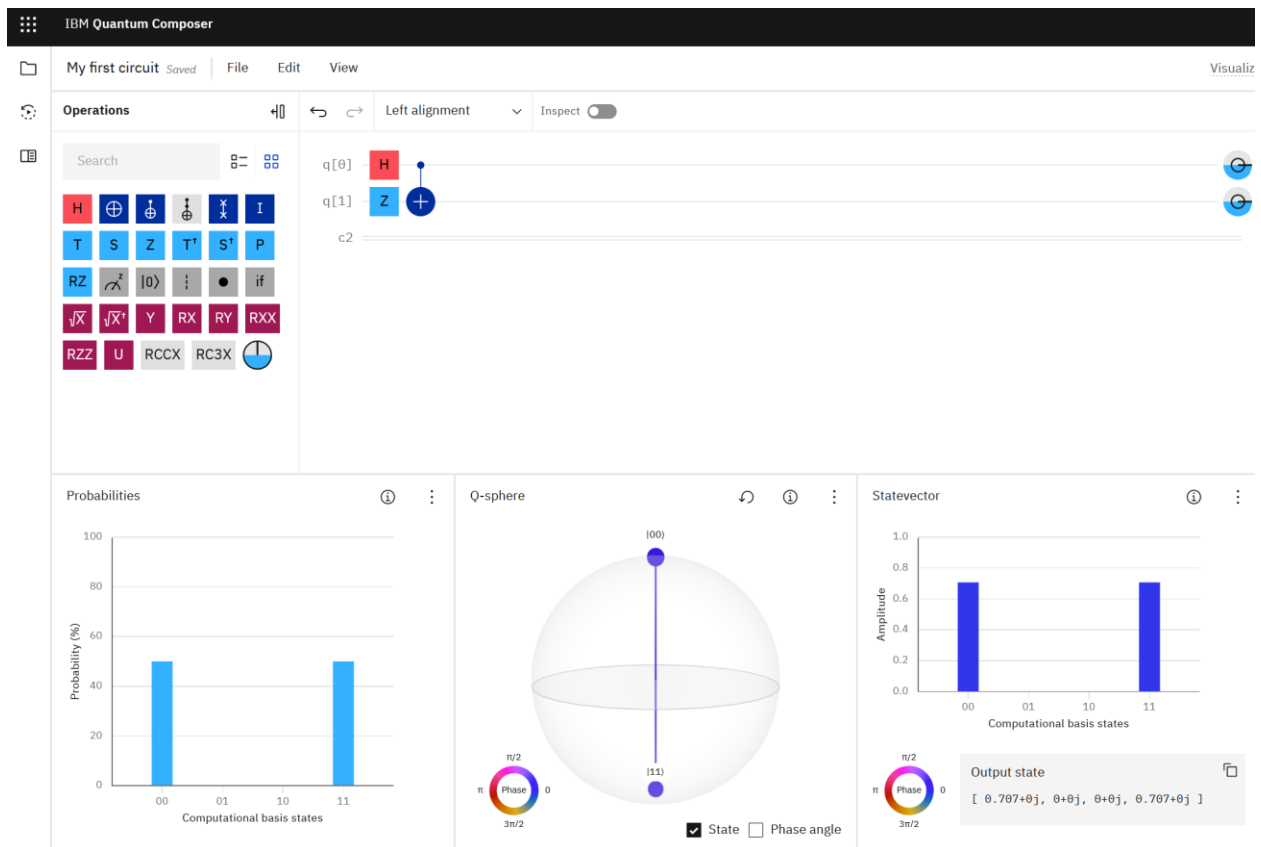
Exercise 1



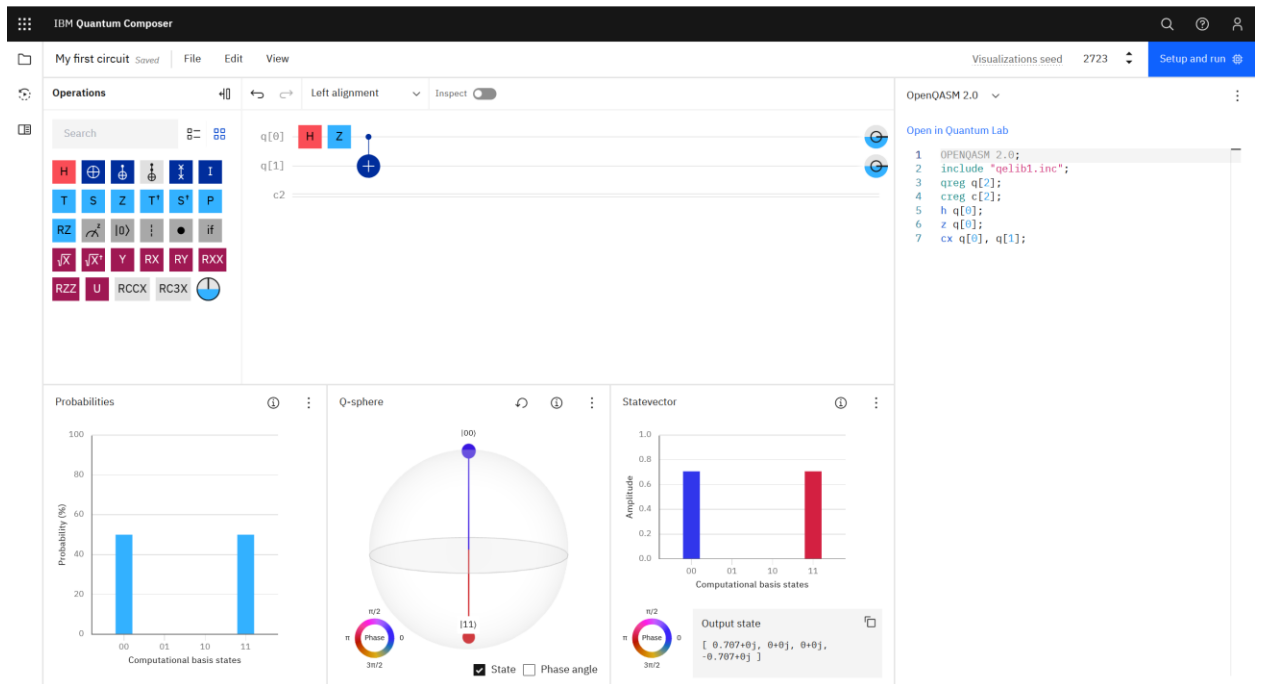
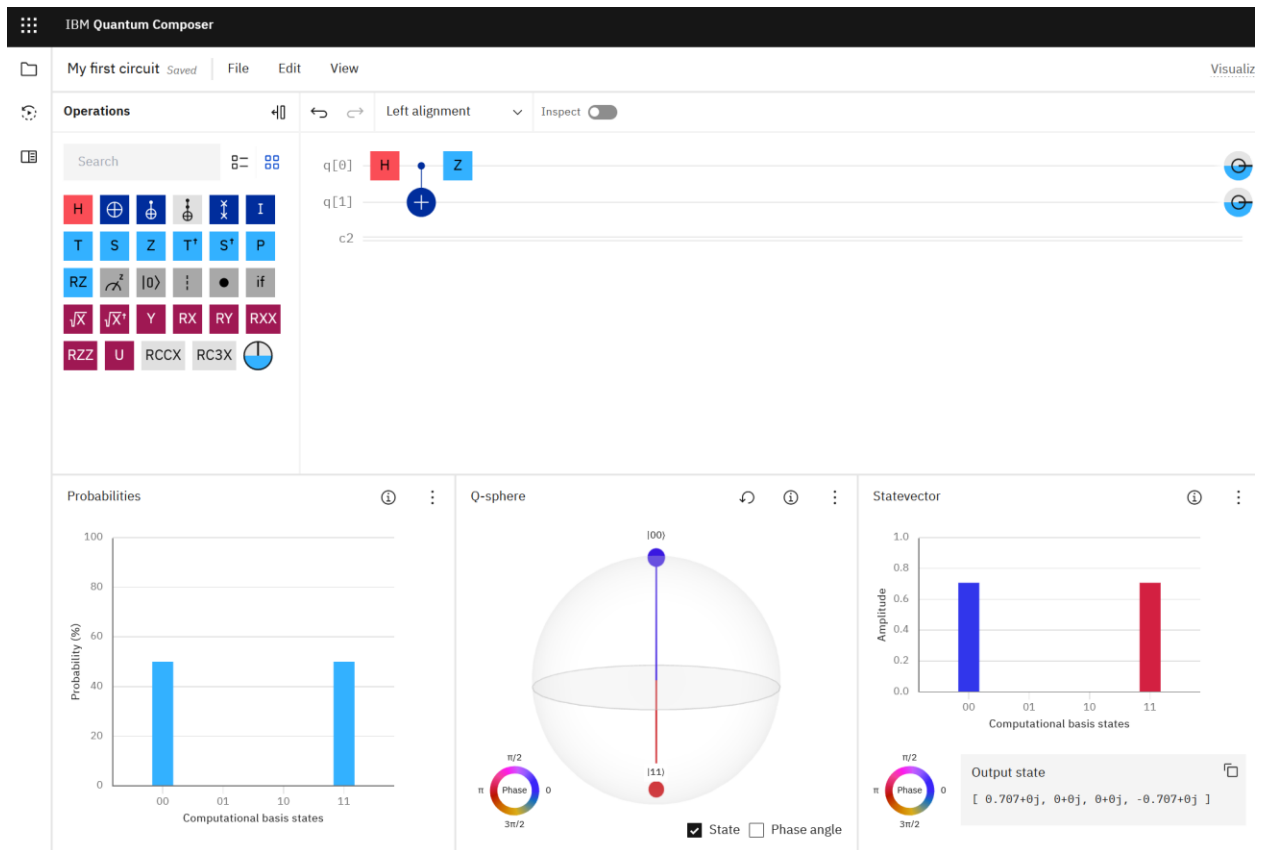
Exercise 2

When the Z gate is on the q[1] the State Vector Shows the states like this ,

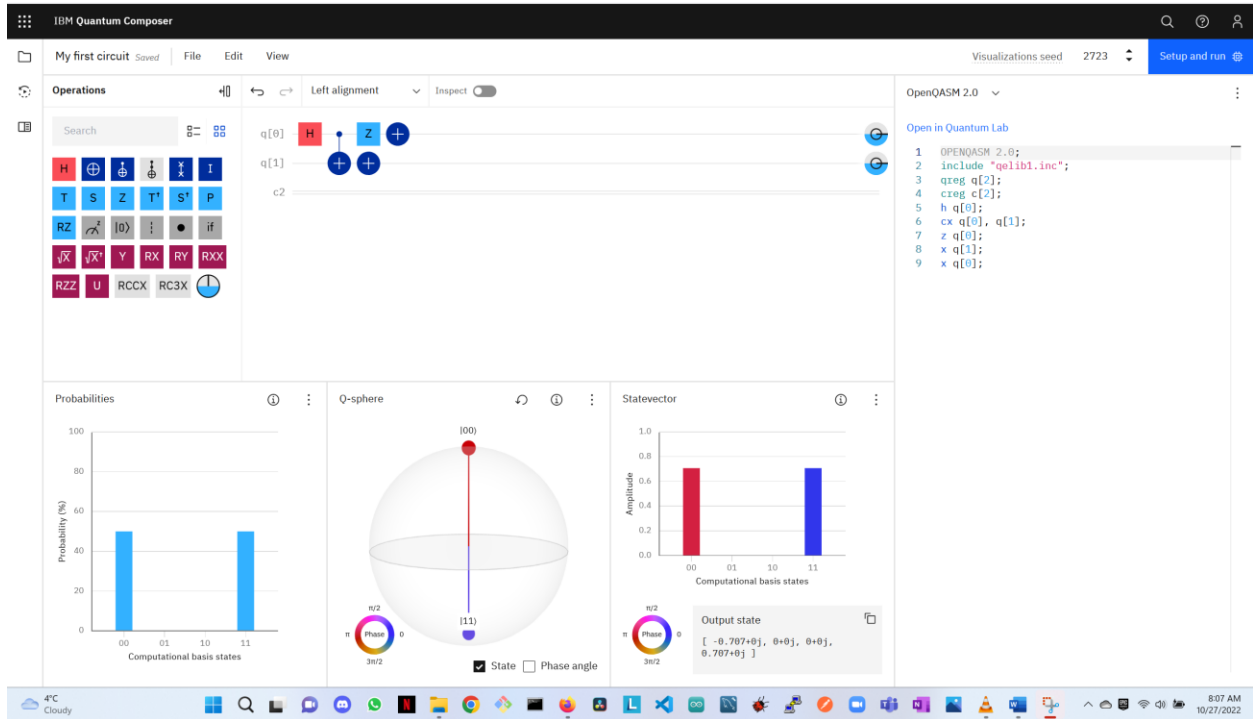
State 00 and State 11 are both at 0 angle and Amplitude of 0.707



But When I put the Z Gate on the $q[0]$, there is a phase angle of the 11 state amount to π . This π means 180 degrees and when it is in red it means that it is in opposite direction.



The phase of the $|00\rangle$ result became phase shifted when I add Not Gates in the following order.

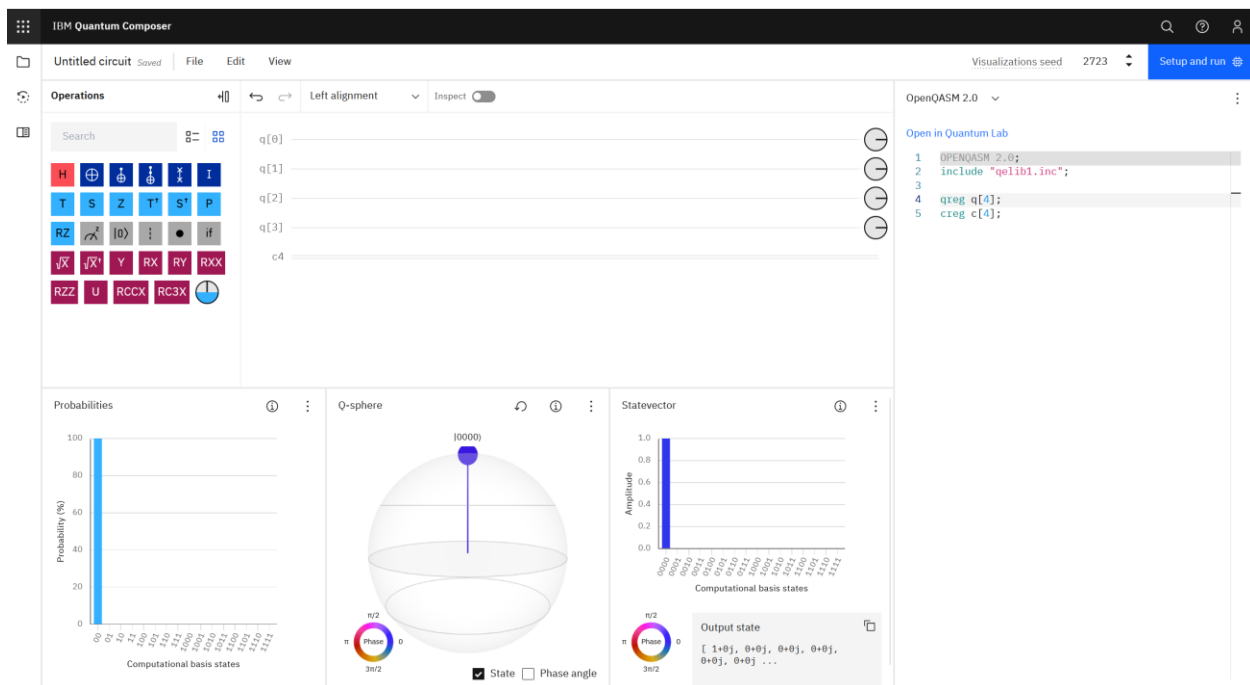


Why is the phase shift is useful in quantum computing?

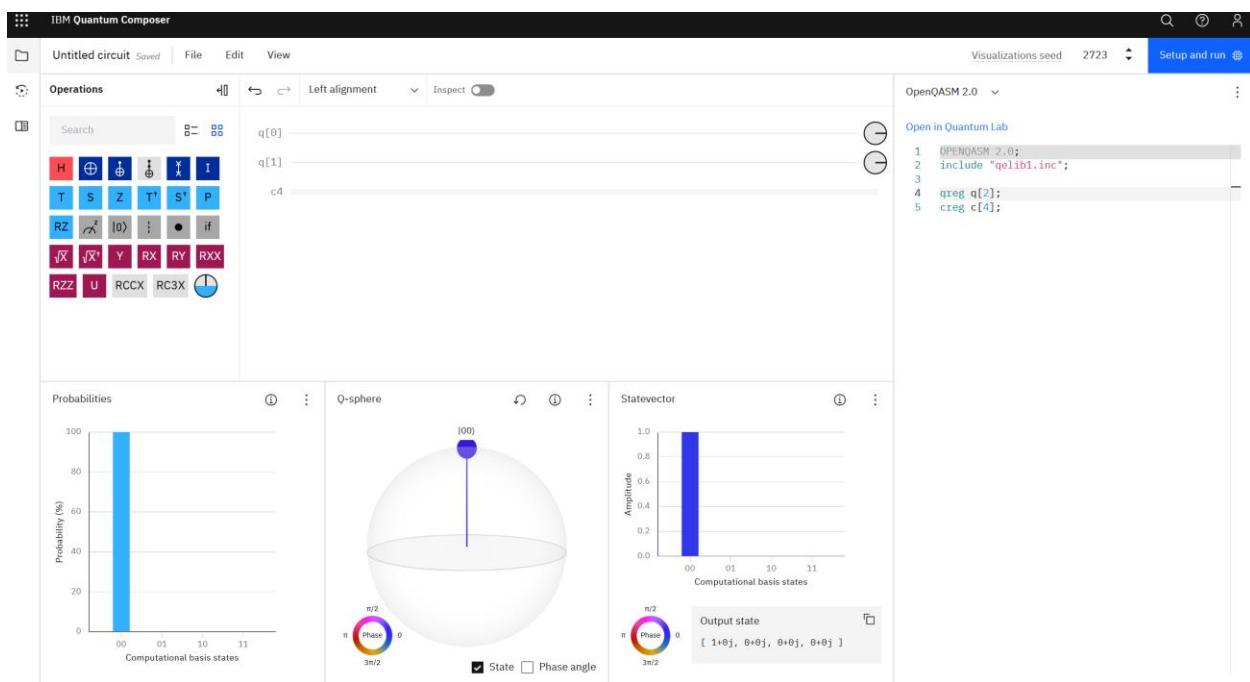
This phase is as per my understanding must be a complex number. So, I think the shift in those numbers matter more when doing quantum calculations.

Exercise 3

Before changing the code line

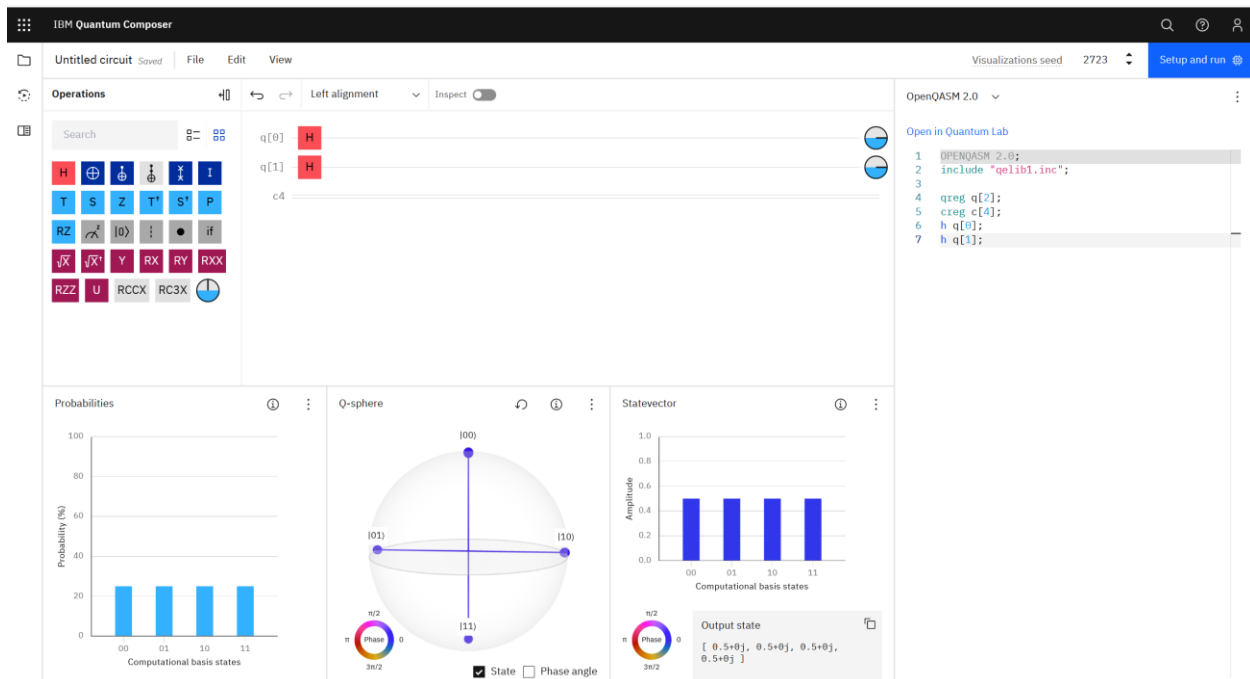


After changing the code line

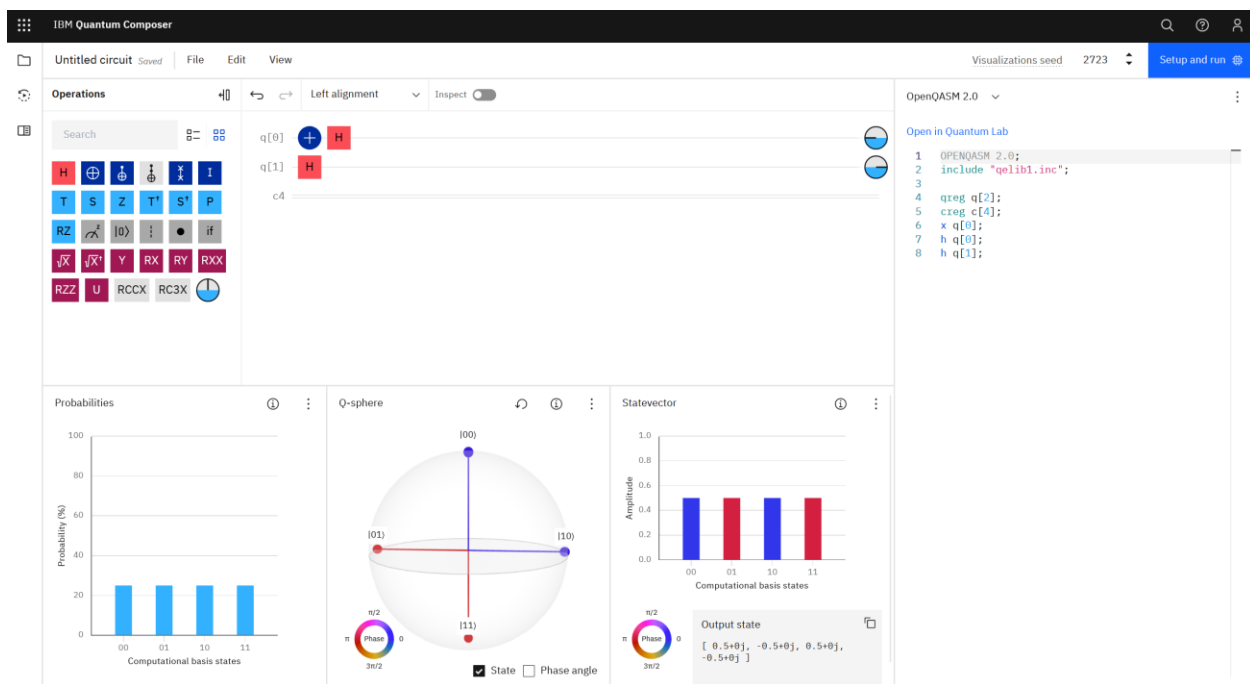


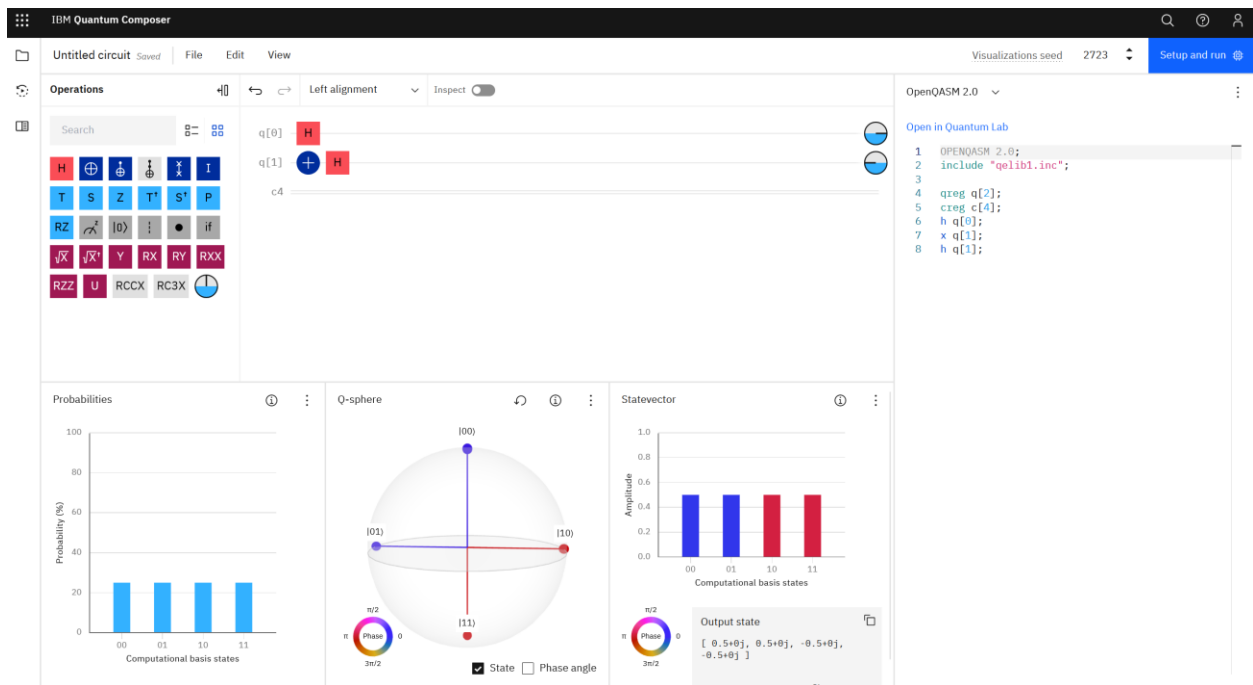
Initially the space for computational states were high. But then it suddenly dropped to fewer states

Adding a H Gate

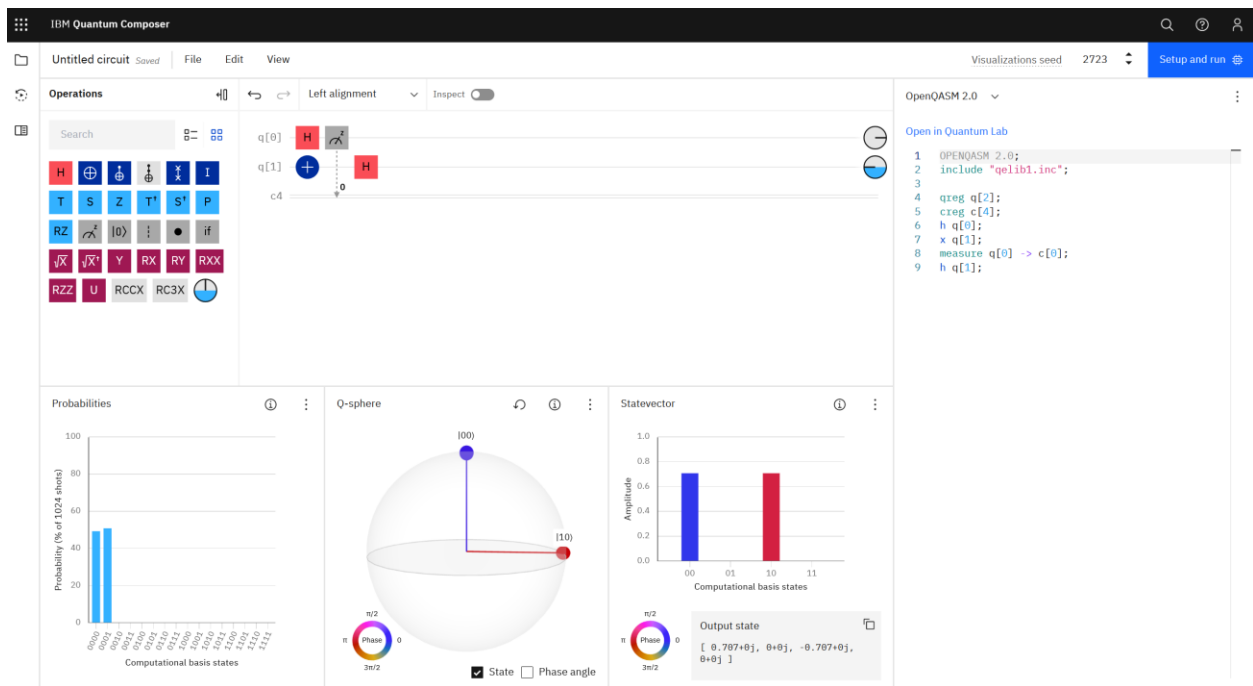


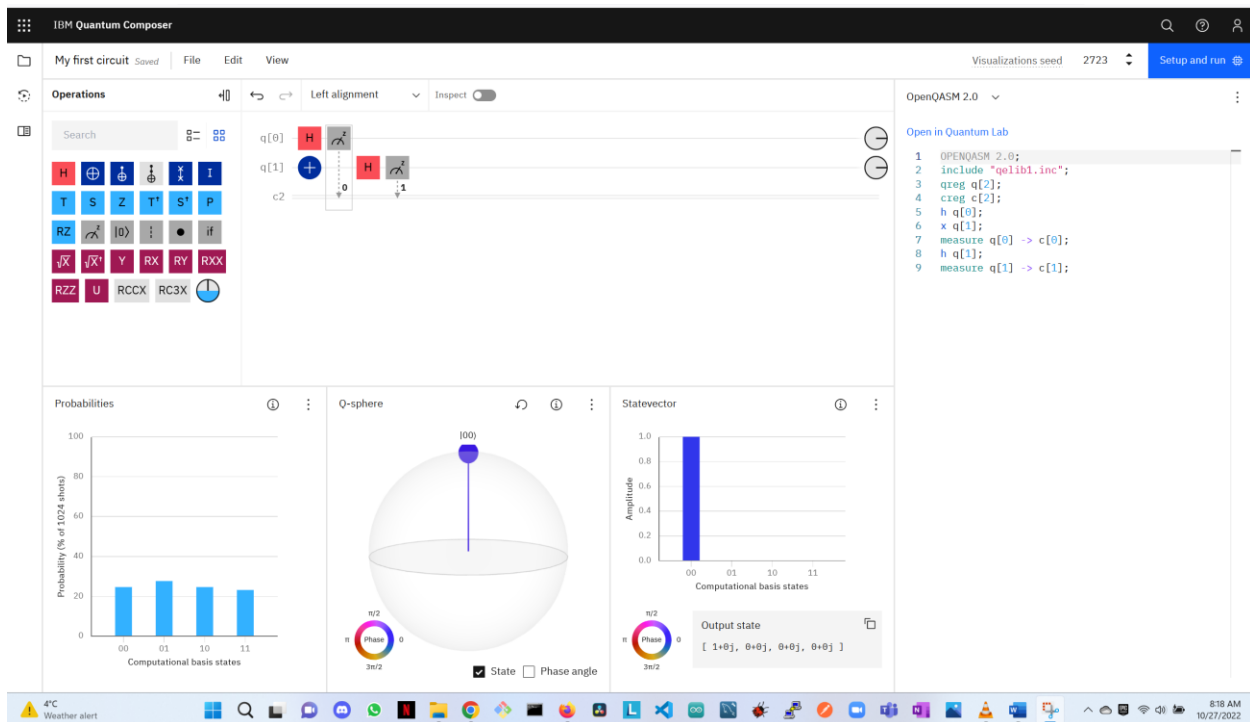
Adding NOT Gates



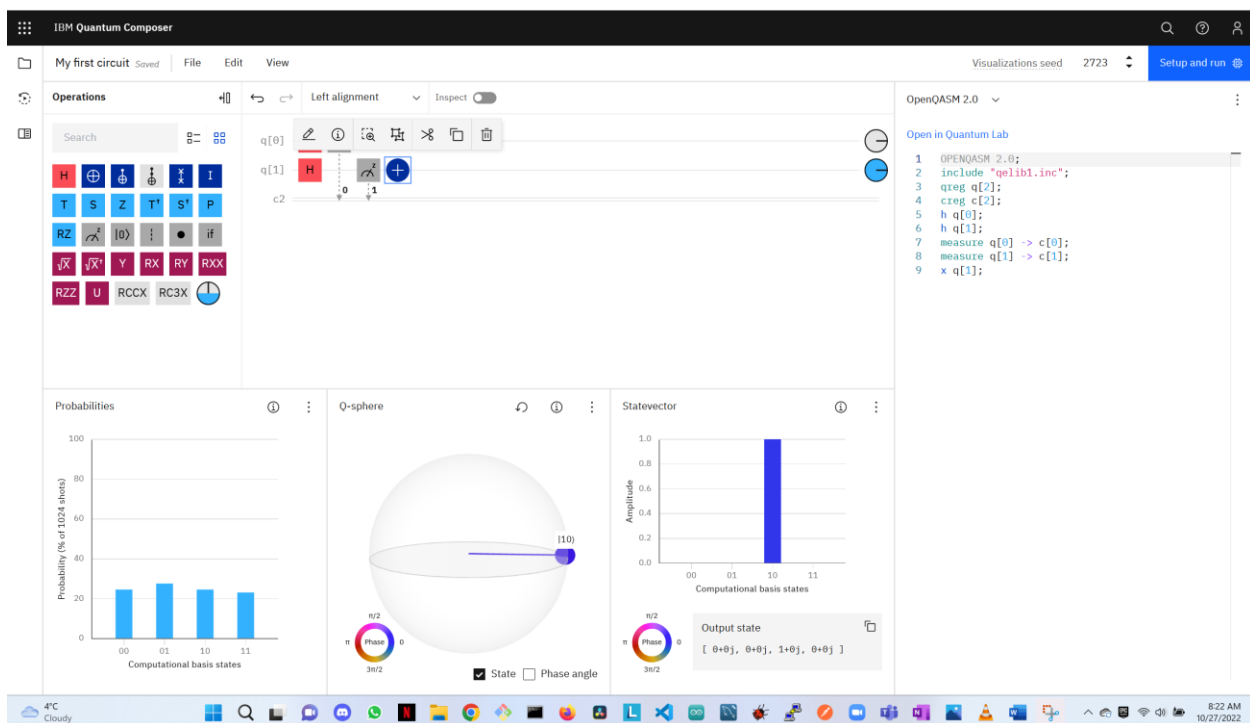


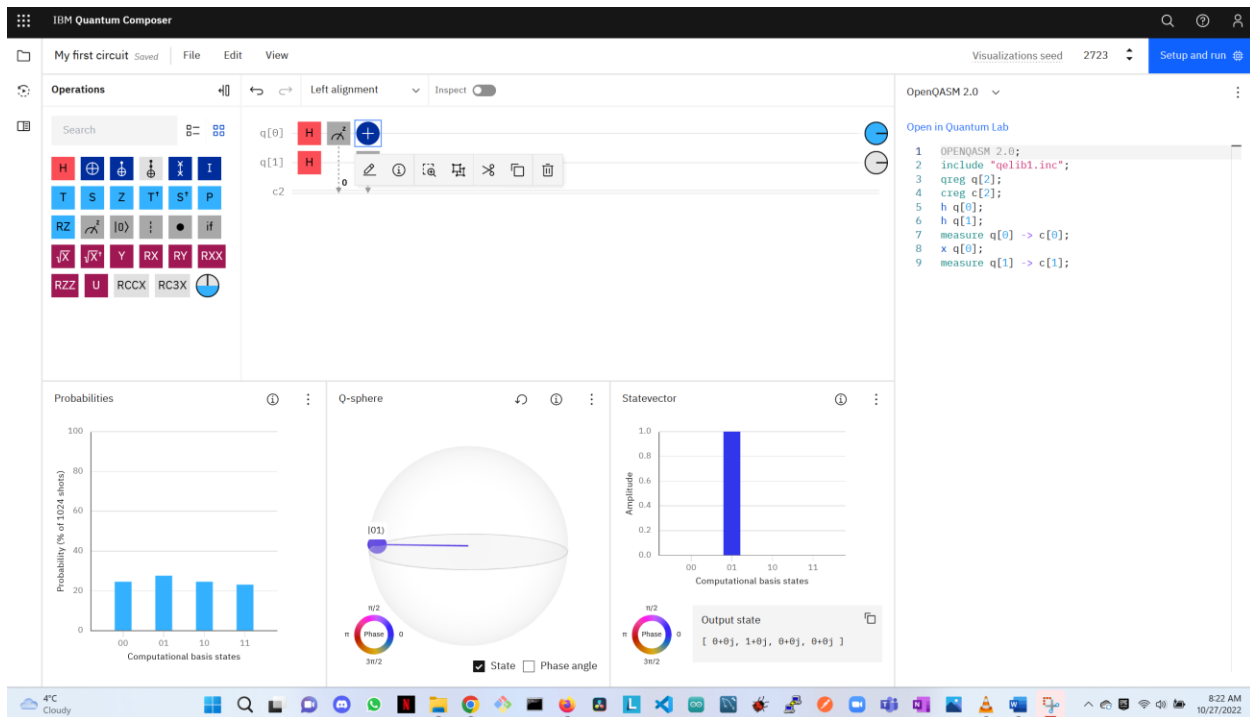
Adding measurements





Moving the NOT after the measurements.





Exercise 4

