CprE 492 - sdmay20-08
Cirq: A Python Framework for Creating, Editing, and Invoking Quantum Circuits
Week 3 Report
2/14/2020 - 2/27/2020

AJ Hanus - Researcher, Developer
Andrew Hancock - Researcher, Developer
Austin Garcia - Researcher, Developer
Calista Carey - Researcher, Developer
Jake Shedenhelm - Researcher, Developer
Jordan Cowen - Researcher, Developer

Client: Victory Omele
Faculty Advisor: Akhilesh Tyagi

Weekly Summary:

This week, each partner group continued working on their specific gates or control flow. There was a bit of confusion between which gates were considered standard versus non standard, but on Sunday, we were able to determine the difference between the two. There has also been a lot more work done on the quil_output.py file that will eventually be the parser for our translation. Our quil.py file is coming together. This file is going to be used to map qubits and contain arguments for gates in the circuit translation

Past week accomplishments:

- Met with Pull Request partners to discuss progress and any concerns
- Get everyone on the EC2 instance that AJ created
- Met in a large group to discuss and connect all three pull requests
- Created new files that all three small groups need to work with

Pending Issues:

The current issues we are working on are the three pull requests we have in the Cirq repository. EC2 instance doesn't have much RAM, so it crashes when testing is attempted

Individual Contributions:

Name	Individual Contributions	Hours this week	Hours Cumulative
Calista Carey	● I have been working individually on my pull request and the gates that I have been assigned. ○ To help with this, I have	7.5 (2/14-2/20) 5 (2/21-2/27)	27

	been relating the gates implemented in Cirq to their descriptions in the pyQuil API ● I have started working on the CZPowGate to the PHASE gate in QUIL. ● I have also been researching the other phase gates and the difference (since there are four). I am currently working on how each needs to be implemented ● I have started the code translation for the Cirq wait gate to the QUIL wait gate, and it isn't too bad. This gate seems the most straight forward of all the gates. ○ This being said, I am not totally sure if there is a difference between a wait gate and the Control Flow Instructions "WAIT" that AJ and Austin are working on ● Jake and I have met individually when we have any questions, and we plan on meeting again very soon to discuss our progress on our PR ● On Sunday, I met with Andrew, Austin, and AJ to discuss our pull requests. When talking with Andrew, I realized Jake and I may have been working with the wrong X,Y,Z, and H gates. After further talking with Andrew, I realized Jake and I need to work on the gates in the Pauli file, not the common gates file.		
Jordan Cowen	Began working on implementing the non standard gates with Andrew. To do this, we have to add a _quil_ method	4 (2/14-2/20) 7(2/21-2/27)	21

	under each of these gates as well as a decompose method. I am doing more research on how to create the decompose function for each of the gates I have been assigned.		
AJ Hanus	I met with the group Sunday and spent some time trying to fix some issues running tests on the EC2 service. I also spent a lot of time working on the quil_output file, which is the parser for the translation from Cirq to QUIL. Austin and I met up a couple of times to dicuss about the progress weve made so far on the project.	6 (2/14-2/20) 6 (2/21-2/27)	29
Austin Garcia	Me and AJ have been working together on Thursdays in order to make progress on our tasks. I was still having some issues with my environment setup so I switched from using the Oracle Virtual Machine to using Visual Studio Code and accessing AJ's setup through that and was able to get everything running successfully. On Sunday AJ, Andrew, Calista, and I met to go over our project and work together. We ended up finding some issues with running tests on the server so we spent some time attempting to solve this issue.	6 (2/14-2/20) 7 (2/21-2/27)	22
Andrew Hancock	● Connected to amazon instance setup by AJ to work more efficiently with the team. Cloned the Cirq git repo into my individual folder. Attempted to run all tests and discovered that our amazon instance does not have enough power to survive	4 (2/14-2/20) 8 (2/21-2/27)	25.5

	that so I will instead be running the tests on my linux machine at home. ● Began programming the _quil_ function for the XXPowGate. Have some skeleton code, but doing more research into how the gate actually works to better understand how to translate it to quil. ● Started installing the Rigetti quantum virtual machine on the amazon instance so that we can run the quil code that our cirq code will output to verify that it works. I'm still running into an error after resolving a few others so my plan is to attack that next.		
Jacob Shedenhelm	This past week has been a very busy week for me. I was traveling out of the state for an interview and therefore was not able to meet with the group on Sunday. However, I have continued to look at the work that needs done and began to implement a few of the '__quil__' functions that are pull request requires. As well, Calista reached out to me and let me know that we had originally looked at the wrong file. This is okay, as it is an easy fix. I began to look at the Pauli Gates file and believe we should be able to complete the coding work required for are PR fairly soon. Of course, this will require us to then move onto the testing phase. If we do indeed complete everything required for our PR then we will reach out and help other groups. As well, AJ set up an AWS instance with cirq installed. This	7.5 (2/14-2/20) 5 (2/21-2/27)	27.5

	will be very helpful for all of us so that we have a consistent environment. I setup my private key and was able to login.		

Plans for Coming Week:

Continue working on each Pull Request with individual partners and book study rooms on Sundays to work as a large group.

Calista: I plan on looking at the CNOT gate next and continue reading more into the PHASE gates in QUIL.

Andrew: Fix bug with qvm install and finish implementation of XXPowGate.