

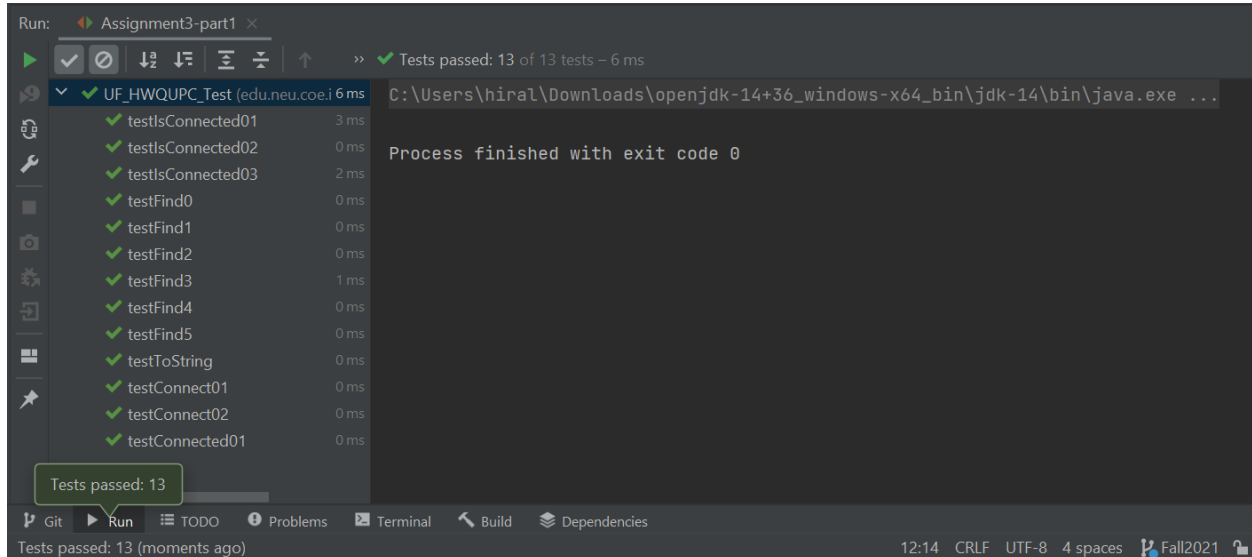
MSSES INFO6205 13718 PROGRAM STRUCTURES & ALGORITHMS SEC 01- FALL2021

ASSIGNMENT 3: HIRAL RAJESH NAGDA (001560027)

Part 1-

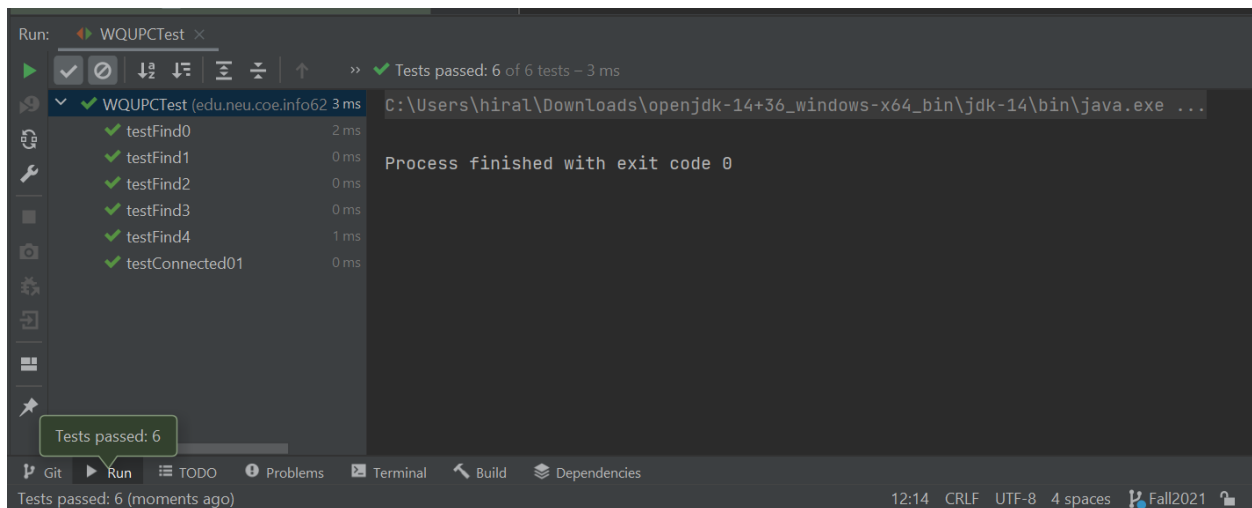
Implemented the required code and pushed to github repo.

Unit Testing – UF_HWQUPC and WQUPC



The screenshot shows the IntelliJ IDEA Run window for the test class `UF_HWQUPC_Test`. The test suite consists of 13 tests, all of which passed. The total execution time for the tests is 6 ms. The output console shows the command `C:\Users\hiral\Downloads\openjdk-14+36_windows-x64_bin\jdk-14\bin\java.exe ...` and the message `Process finished with exit code 0`. The status bar at the bottom indicates that 13 tests passed.

Test Name	Duration
testIsConnected01	3 ms
testIsConnected02	0 ms
testIsConnected03	2 ms
testFind0	0 ms
testFind1	0 ms
testFind2	0 ms
testFind3	1 ms
testFind4	0 ms
testFind5	0 ms
testToString	0 ms
testConnect01	0 ms
testConnect02	0 ms
testConnected01	0 ms



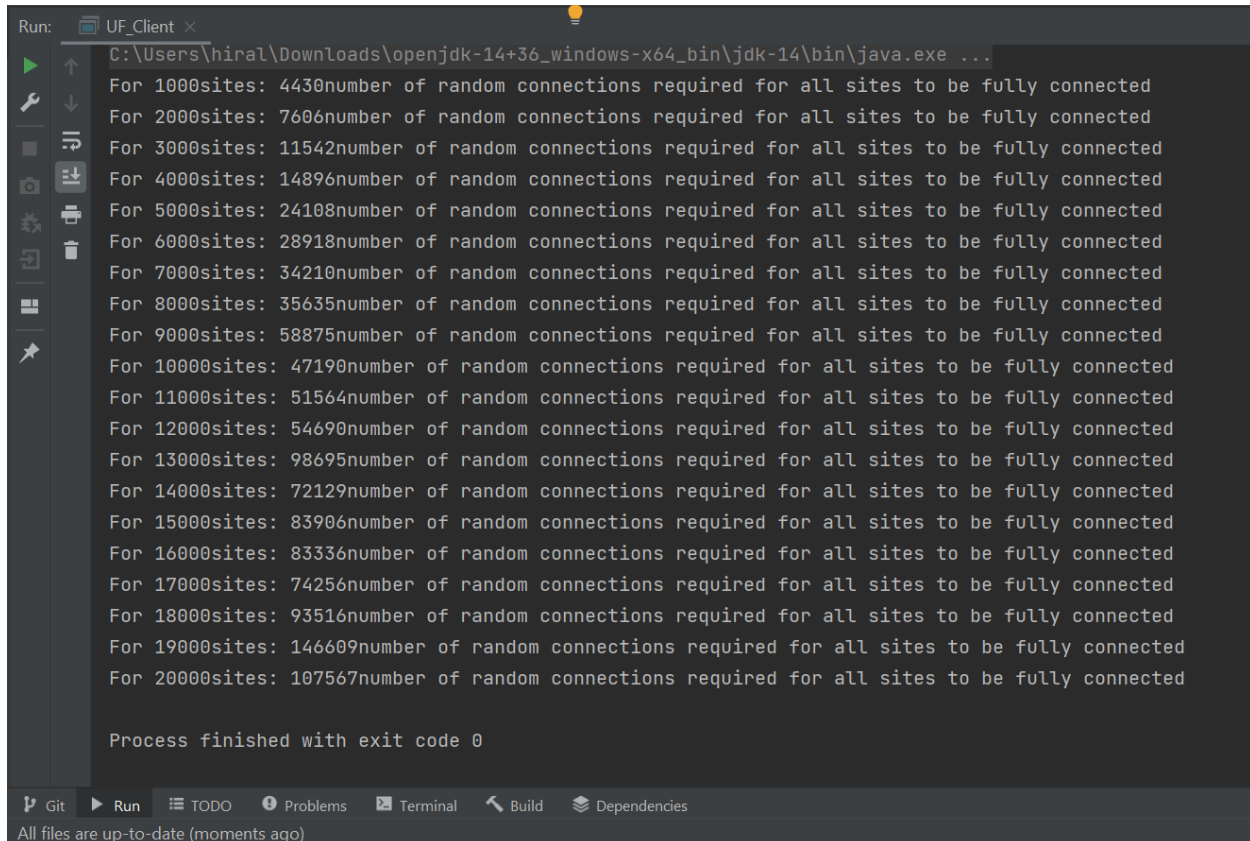
The screenshot shows the IntelliJ IDEA Run window for the test class `WQUPCTest`. The test suite consists of 6 tests, all of which passed. The total execution time for the tests is 3 ms. The output console shows the command `C:\Users\hiral\Downloads\openjdk-14+36_windows-x64_bin\jdk-14\bin\java.exe ...` and the message `Process finished with exit code 0`. The status bar at the bottom indicates that 6 tests passed.

Test Name	Duration
testFind0	2 ms
testFind1	0 ms
testFind2	0 ms
testFind3	0 ms
testFind4	1 ms
testConnected01	0 ms

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Part 2 –

Output for n sites, random generation of connections required for all sites to be fully connected



```
Run: UF_Client x
C:\Users\hiral\Downloads\openjdk-14+36_windows-x64_bin\jdk-14\bin\java.exe ...

For 1000sites: 4430number of random connections required for all sites to be fully connected
For 2000sites: 7606number of random connections required for all sites to be fully connected
For 3000sites: 11542number of random connections required for all sites to be fully connected
For 4000sites: 14896number of random connections required for all sites to be fully connected
For 5000sites: 24108number of random connections required for all sites to be fully connected
For 6000sites: 28918number of random connections required for all sites to be fully connected
For 7000sites: 34210number of random connections required for all sites to be fully connected
For 8000sites: 35635number of random connections required for all sites to be fully connected
For 9000sites: 58875number of random connections required for all sites to be fully connected
For 10000sites: 47190number of random connections required for all sites to be fully connected
For 11000sites: 51564number of random connections required for all sites to be fully connected
For 12000sites: 54690number of random connections required for all sites to be fully connected
For 13000sites: 98695number of random connections required for all sites to be fully connected
For 14000sites: 72129number of random connections required for all sites to be fully connected
For 15000sites: 83906number of random connections required for all sites to be fully connected
For 16000sites: 83336number of random connections required for all sites to be fully connected
For 17000sites: 74256number of random connections required for all sites to be fully connected
For 18000sites: 93516number of random connections required for all sites to be fully connected
For 19000sites: 146609number of random connections required for all sites to be fully connected
For 20000sites: 107567number of random connections required for all sites to be fully connected

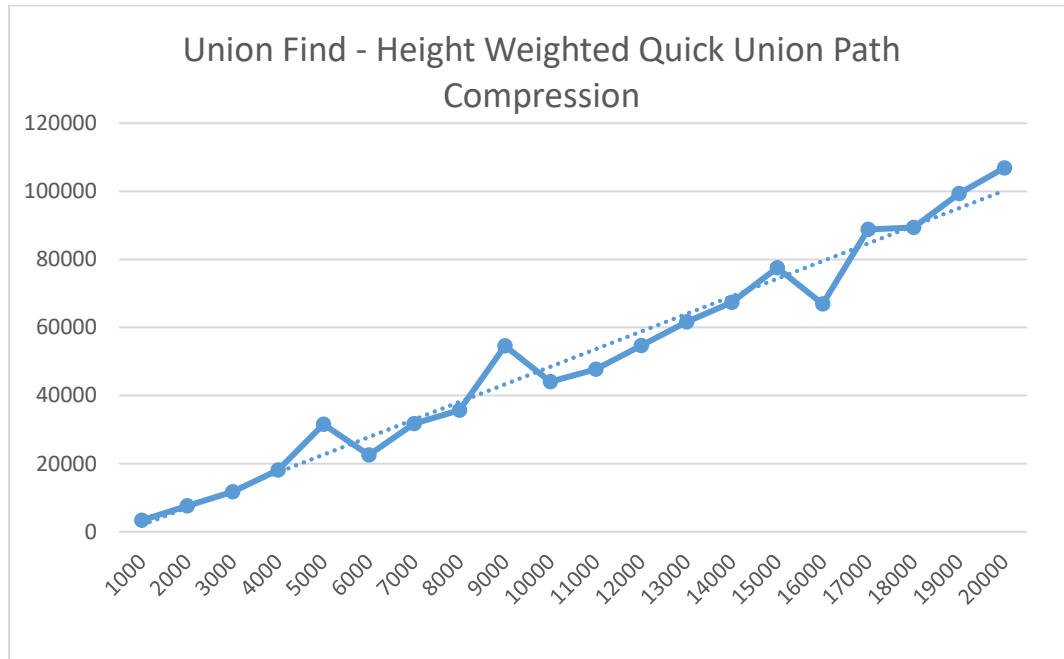
Process finished with exit code 0

Git Run TODO Problems Terminal Build Dependencies
All files are up-to-date (moments ago)
```

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Part 3 -

The relationship between the number of objects (n) and the number of pairs (m) generated



Inferring from the above graph, we can conclude that the number of objects(n) and number of pairs generated(m) have linear relationship.

$$n \propto m$$