Assignment-3
Vennela Reddy Karaddi
NU ID : 001081643

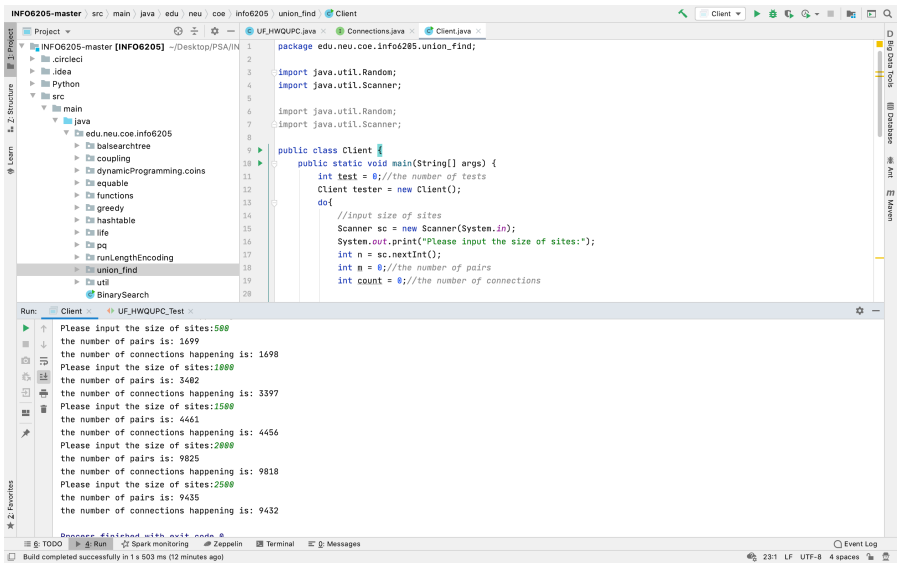
Problem:

Implement height-weighted Quick Union with Path Compression. Check that the unit tests for this class all work.

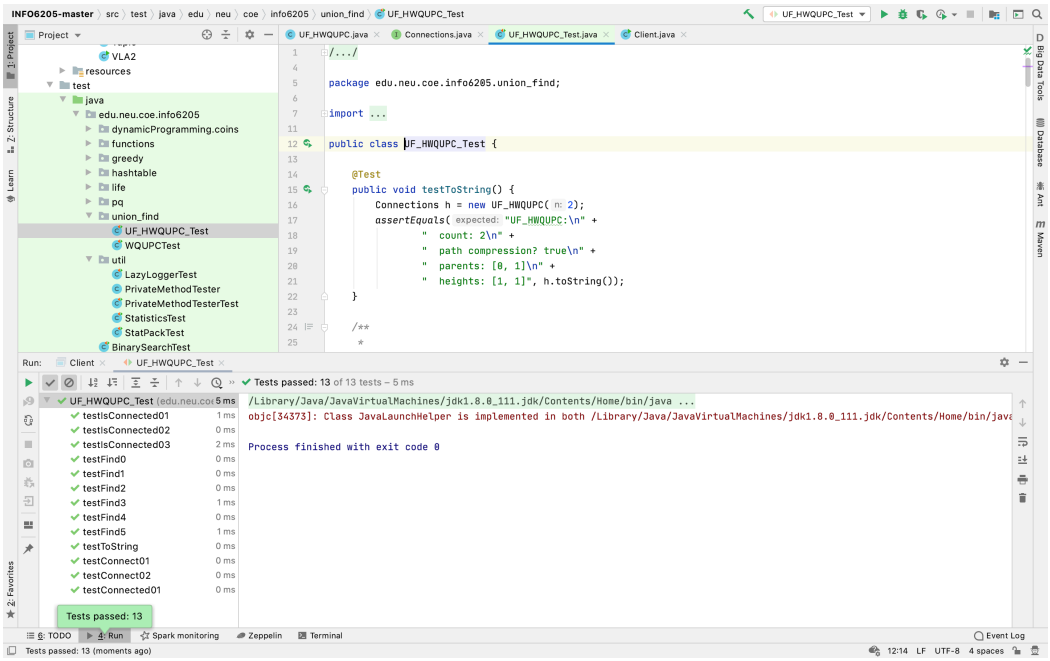
Using your implementation of UF_HWQUPC, develop a UF ("union-find") client that takes an integer value n from the command line to determine the number of "sites." Then generates random pairs of integers between 0 and n-1, determine if they are connected and union() if not.prints the returned value. If you prefer, you can create a main program that doesn't require any input and runs the experiment for a fixed set.

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

Output:



Testcases:



Conclusion :

As number of objects increases, number of pairs also increase in m = n/2 log n ;

When n =500 ; m = 500/2 log 500 = 2225

When n =1000; m = 1000/2 log 1000 = 4980

When n =2500 ; m = 2500/2 log 2500 = 13750

Below values are from my program which are close to relation above.

number of objects	Number of pairs generated
500	1699
1000	3402
1500	4461
2000	9825
2500	9435