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INFO 6205

Program Structures & Algorithms

Spring 2020

Assignment No: 3

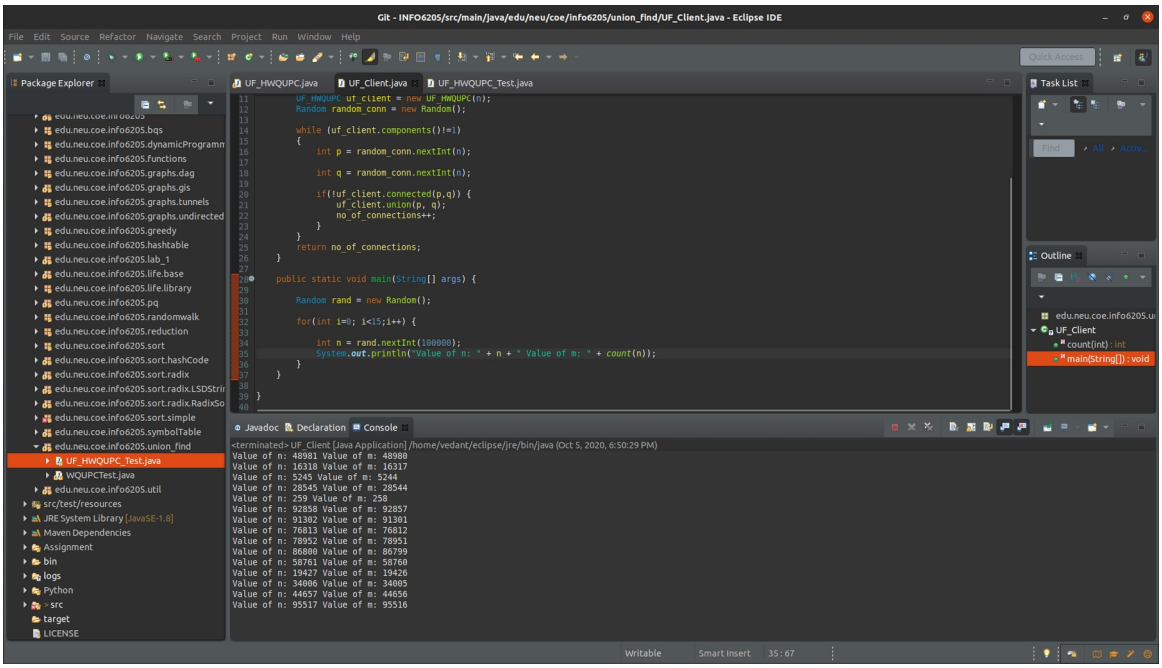
- **Task: To find out the relation between the reducing the number of components from N to 1 is almost linear (m = n-1)**

- **Output:**
  Below are the values of (m) pairs generated for 15 different values of object (n) as input:-

```
Value of n: 48981 Value of m: 48980
Value of n: 16318 Value of m: 16317
Value of n: 5245 Value of m: 5244
Value of n: 28545 Value of m: 28544
Value of n: 259 Value of m: 258
Value of n: 92858 Value of m: 92857
Value of n: 91302 Value of m: 91301
Value of n: 76813 Value of m: 76812
Value of n: 78952 Value of m: 78951
Value of n: 86800 Value of m: 86799
Value of n: 58761 Value of m: 58760
Value of n: 19427 Value of m: 19426
Value of n: 34006 Value of m: 34005
Value of n: 44657 Value of m: 44656
Value of n: 95517 Value of m: 95516
```

```
It is evident from the values obtained that the time required to
reduce the N number of components to 1 is almost linear I.e m
=n-1
```

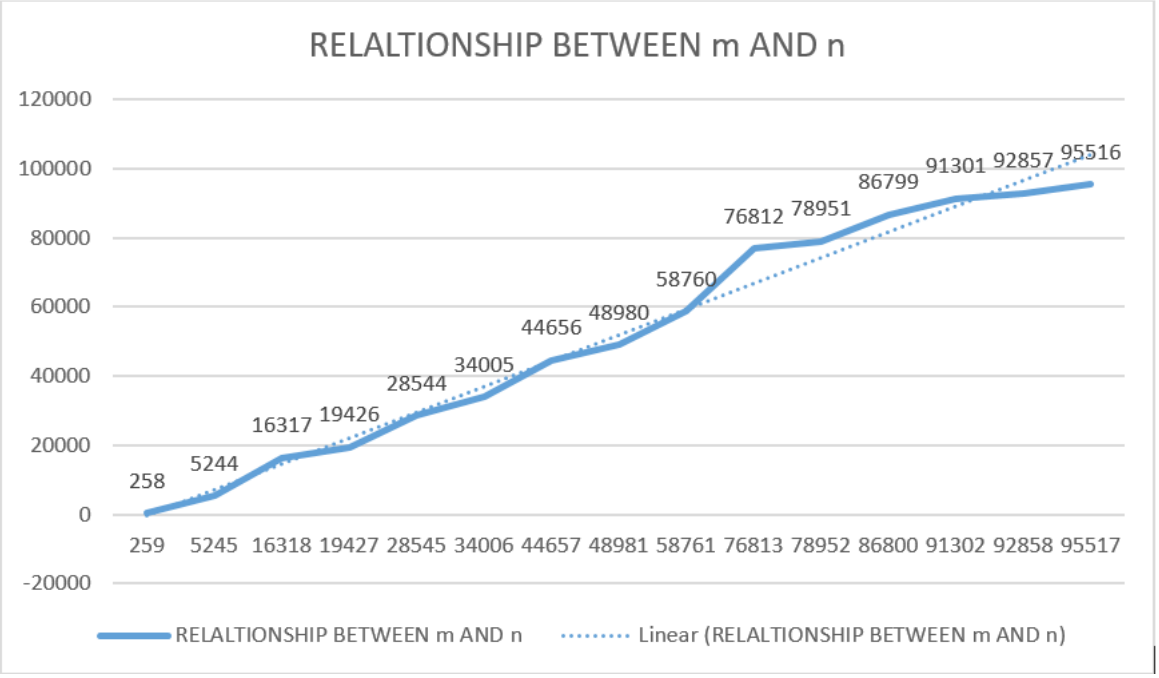
Output:



- **Relationship conclusion:**
  A main class is created, and it is run for the 5 different values to affirm our conclusion. It is to be noted, that the main class is created within the UF_HWQUPC.java.
  From the graph also, it can be concluded that the relation between the two entities is natural logarithmic. Thereby, solidifying our conclusion.

- **Evidence to support relationship** (screen shot and/or graph and/or spreadsheet)
  Below are the screenshot of the output screen and a subsequent graph is formed to analyze the data acquired through our program for pictorial understanding. As expected, the graphs are in alignment of our conclusion

Graph as Evidence:



- **Screenshot of Unit test passing:**
  Below is the test case passing of the UF_HWQUPC_Test