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**Program Structures & Algorithms**  
**Fall 2021**  
**Assignment 3**

**1. Tasks Performed in the Assignment :**

- a. Implemented the code for find(), mergeComponents(), doPathCompression() methods mentioned in UF\_HWQUPC class
- b. Created the **UFClient** class to test the **UF\_HWQUPC** code for large values of n (number of objects).

**File Path:** src/main/java/edu/neu/coe/info6205/union\_find/UFClient.java

- c. Plotted the excel graph for Number of Object vs Number of Pairs
- d. Ensured that all the test cases ran successfully in UF\_HWQUPC\_Test class

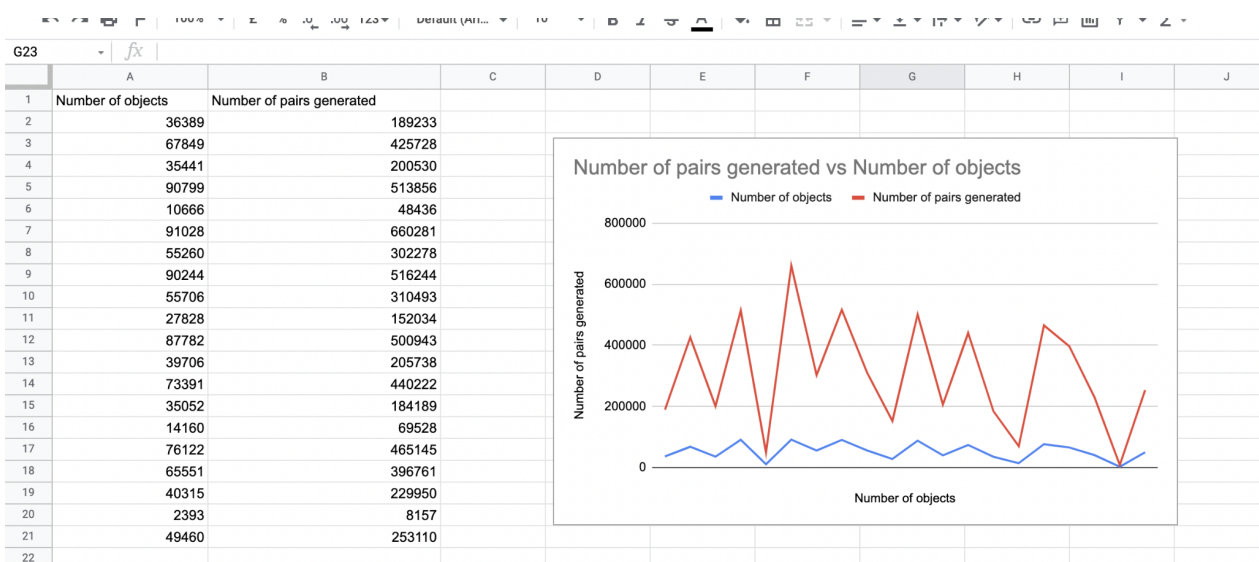
**2. Relationship conclusion:**

The relationship between number of Objects (n) and number of pairs (m) generated to reach to single component i.e all objects should be connected is mentioned below:

Let **n** be number of objects

Let **m** be number of pairs generated to connect those objects

$$m \sim 0.5 * n \log n$$



### 3. Evidence to support conclusion

