Program Structures & Algorithms

Spring 2022

Assignment No. 3

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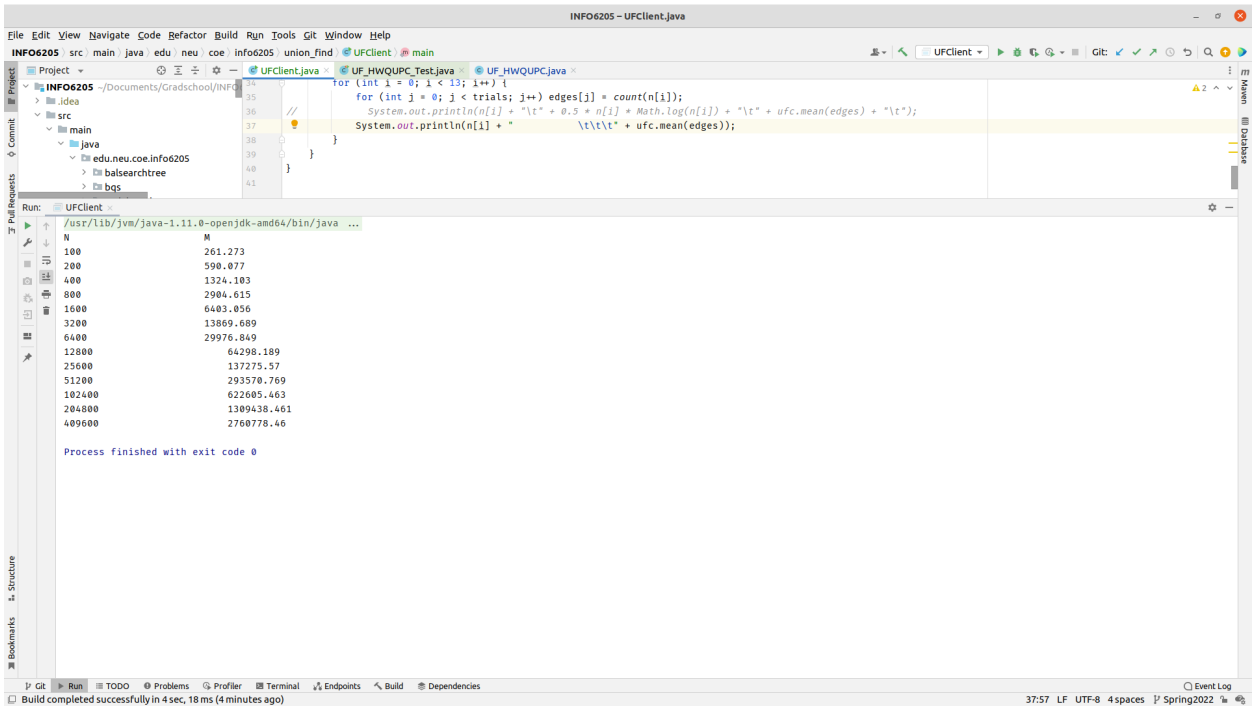
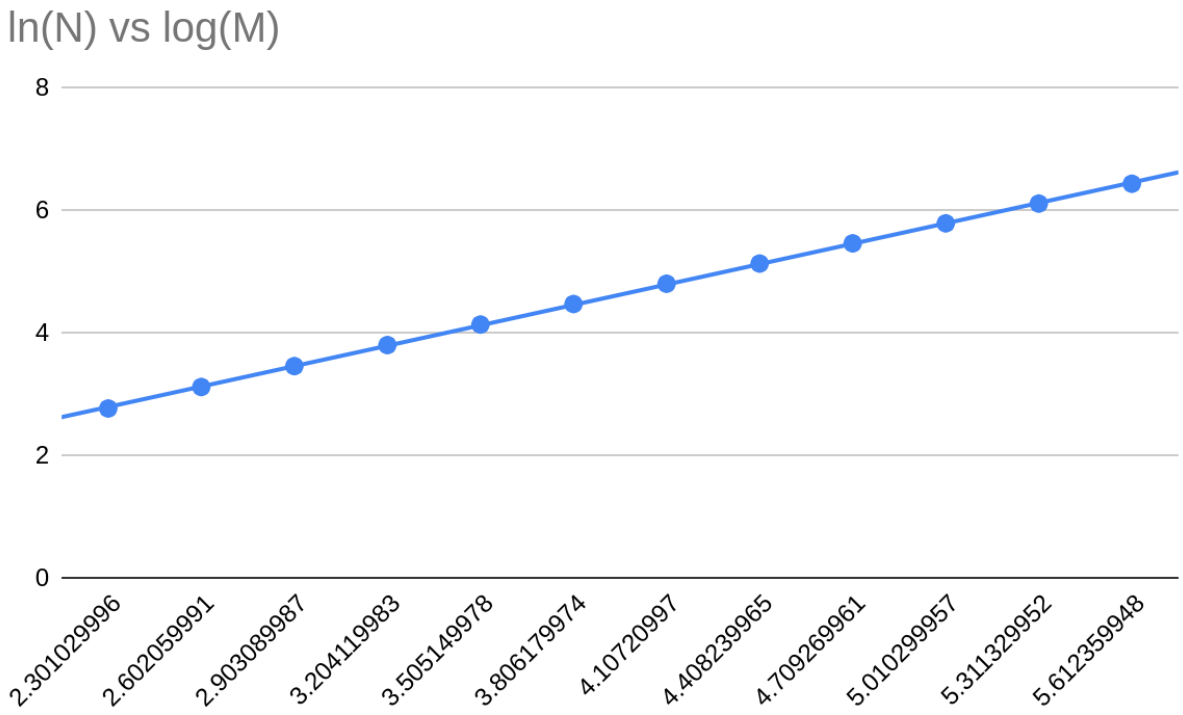
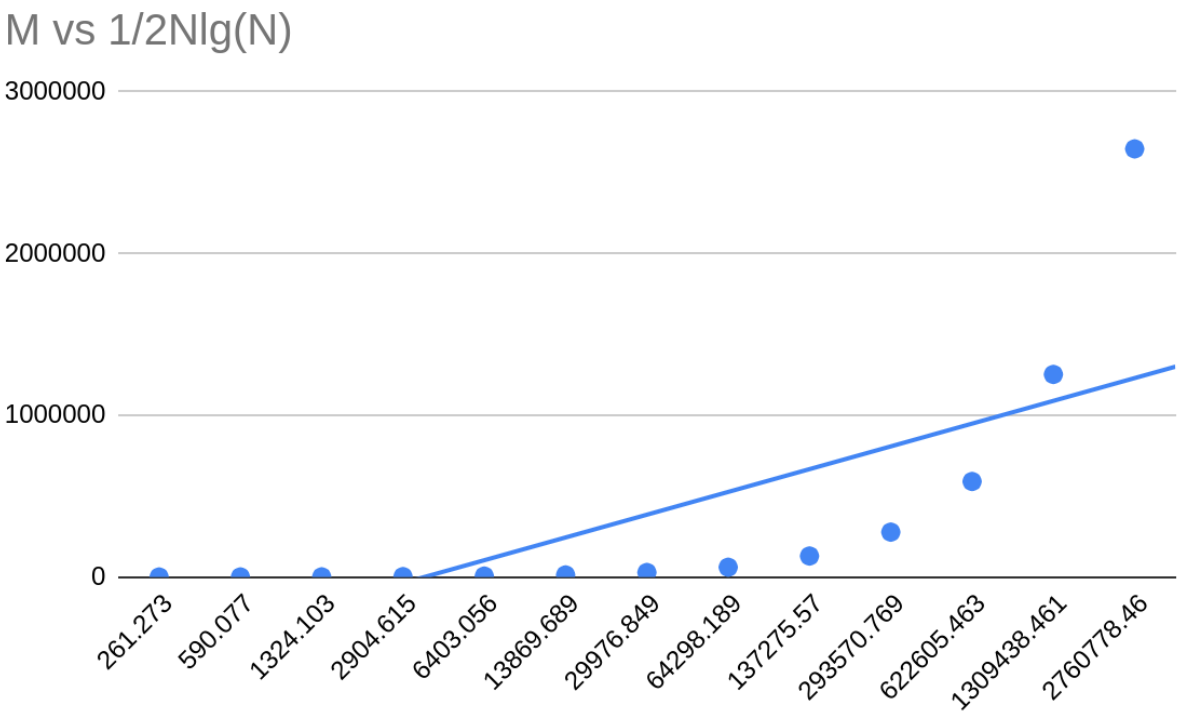
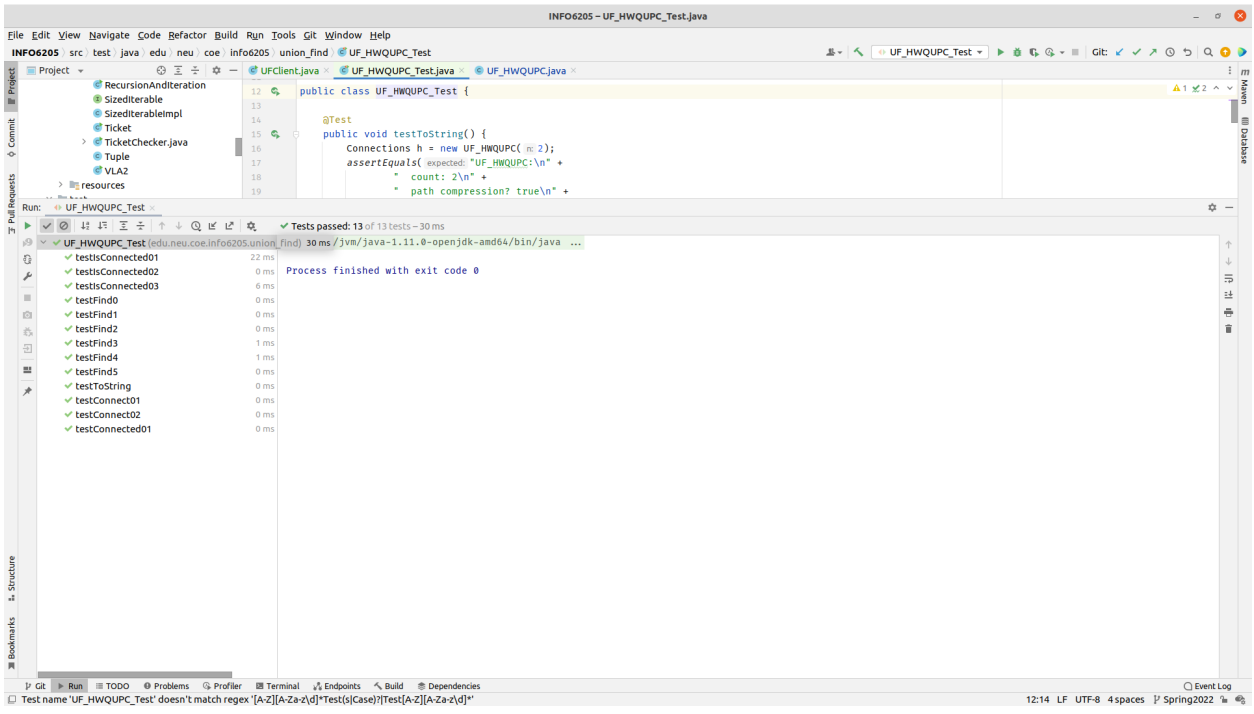
- **Task:**
  - Implement height weighted quick union with path compression
  - Create a client to perform height weighted quick union with path compression
  - Find the relation between the number of objects (N) and the number of pairs(M)
- **Output screenshot**



- **Relationship Conclusion**
  - Number of Pairs (M) = 1 / 2 N ln(N)
- **Evidence / Graph**



After looking at the regression lines and calculating the coefficient another term must be combined with N. natural log seems like the obvious choice. Since the N * ln(N) seems like a huge value. Its been divided by 2 and thus gives us the equation ½ Nln(N), which is approximately equal to M. This is identified from the graph below.



- **Unit tests result**