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Program Structures & Algorithms

Fall 2021

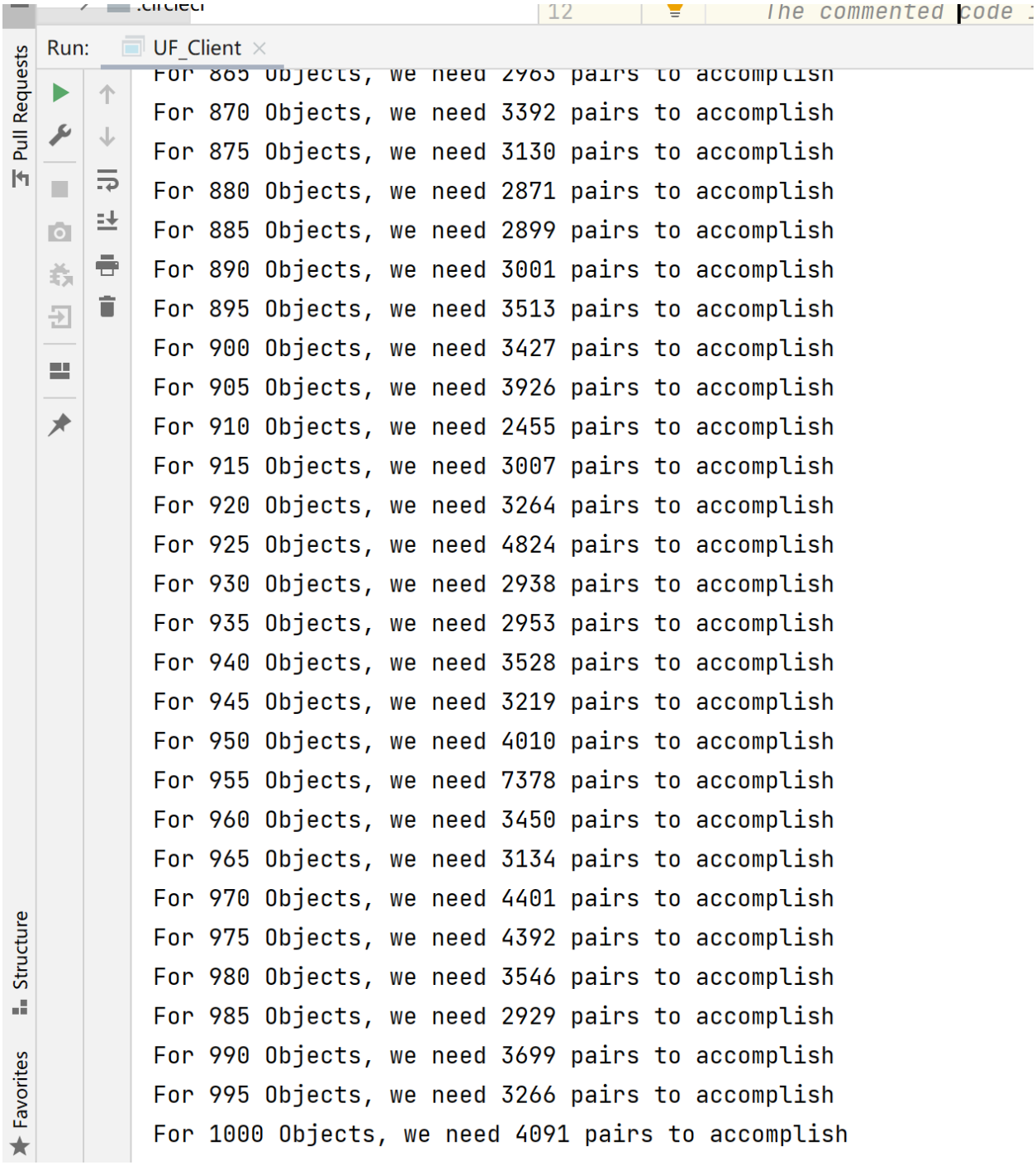
Assignment No. 3

- **Task (List down the tasks performed in the Assignment)**
  1. Implement height-weighted Quick Union with Path Compression.
  2. 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."
  3. Determine the relationship between the number of objects (n) and the number of pairs (m) generated to accomplish this
- **Relationship Conclusion: (For ex : z = a * b)**

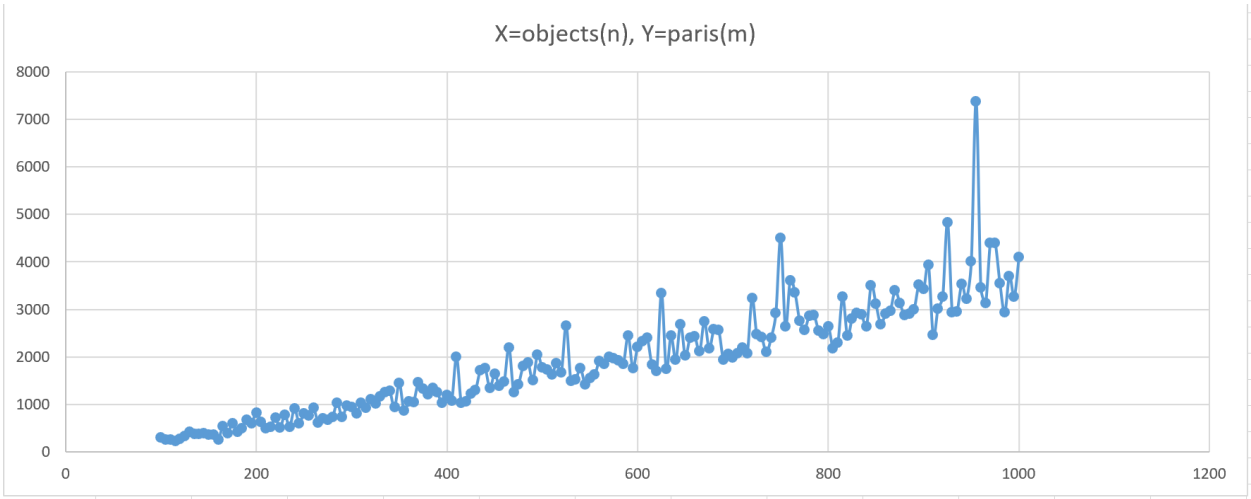
  Linear relationship

  m(pairs)=C*n(objects)
- **Evidence to support the conclusion:**

1. **Output (Snapshot of Code output in the terminal)**



2. **Graphical Representation(Observations from experiments should be tabulated and analyzed by plotting graphs(usually in excel) to arrive on the relationship conclusion)**



From the graph I generated in Excel, we can tell that even though the fluctuation grows more and more unstable, the relationship between n(objects) and m(pairs) are still linear.

- **Unit tests result:(Snapshot of successful unit test run)**