**Program Structure and Algorithms (INFO-6205 SEC01)**

**Assignment – 3**

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**TASK**

Task for this assignment is in three parts.

1. Implemented height-weighted Quick Union with Path Compression.
2. Implemented doPathCompression method.
3. Implemented mergeComponents method.

**OUTPUT SCREENSHOT**

A screenshot of a computer

Description automatically generated

**CONCLUSION**

From the results, we can conclude that the relationship between number of objects(n) and numbers of pairs(m) is as follows:

**M = (0.5) \*N(ln N**)

i.e. M is equal to half times the product of number of pairs(N) and the log of number of pairs(N).

**EVIDENCE**

|  |  |  |
| --- | --- | --- |
| **Objects** | **Pair** | **1/2\*N\*(ln N)** |
| 25 | 46 | 40.23594781 |
| 50 | 75 | 97.80057514 |
| 100 | 298 | 230.2585093 |
| 200 | 441 | 230.1029996 |
| 400 | 1387 | 1198.292909 |
| 800 | 2879 | 2673.844691 |
| 1600 | 4949 | 5902.207127 |
| 3200 | 13651 | 12913.44974 |
| 6400 | 26643 | 28044.97046 |
| 12800 | 61158 | 60526.08288 |

**UNIT TESTS:**

**Graphical user interface, text

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