**Program Structure and Algorithms**

**Assignment - 3 Weighted Quick Union with Path Compression (WQUPC)**

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**TASK:**

1. Implement the method doPathCompressions which should implement the single-pass path-halving mechanics of path compression by changing the parent of the node by it’s parent’s parent.
2. Implement the method mergeComponents while checking if the arguments are not same (return if same). If they are not connected, find those and compare their parent’s height and assign the smaller height to the new parent of the larger element. Do the same thing if height of second element is less than
3. Implement the method find which looks for

**OUTPUT:**

A computer screen capture

Description automatically generated with medium confidence

**CONCLUSION:**

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

**M = ½ \* N (Ln N)**

**EVIDENCE:**

|  |  |  |
| --- | --- | --- |
| **Sites** | **Pairs** | **1/2\*N(Ln N)** |
| 100 | 262 | 230.2585093 |
| 150 | 434 | 375.7976471 |
| 200 | 518 | 529.8317367 |
| 250 | 782 | 690.1826147 |
| 300 | 816 | 855.5673712 |
| 350 | 956 | 1025.138302 |
| 400 | 1156 | 1198.292909 |
| 450 | 1523 | 1374.580706 |

**UNIT TESTS:**

**A screenshot of a computer

Description automatically generated with medium confidence**