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**ASSIGNMENT-4**

**TASK:**

Step 1: Implement height-weighted Quick Union with Path Compression. Check for all the unit test cases

Step 2: Using the 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." Generates random pairs of integers between 0 and n-1, calling connected() to determine if they are connected and union() if not. Loop until all sites are connected then print the number of connections generated. Package the program as a static method count() that takes n as the argument and returns the number of connections; and a main() that takes n from the command line, calls count() and prints the returned value or create a main program that doesn't require any input and runs the experiment for a fixed set of n values. Show evidence of the run(s).

Step 3: Determine the relationship between the number of objects (*n*) and the number of pairs (*m*)

**Relationship Conclusion:**

Based on the data produced,  it is evident that the number of pairs(m) created is proportional to the number of objects(n) supplied as input:

**m ~ 5\*n**

**OUTPUT:**

The result below depicts the number of pairs(m), number of objects(n), function and offsetValue.

Text

Description automatically generated

Text

Description automatically generated

**Evidence:**

The below table and the graph depicts the relationship between the number of objects(n) and number of pairs(m) for different sets of values for both n and m.

Table

Description automatically generated

Chart, line chart

Description automatically generated

**Passed Unit Test Cases:**

Text

Description automatically generated

Graphical user interface, text

Description automatically generated

**Source code:**

The source code for this assignment is available on my repository: **https://github.com/ShreyaBaliga2408/Union\_Find/tree/uf**