Activity 8 :
Question :
Analyse the output of the above problem, find which process is better? and why?
Solution :
Union Find can be implemented in the following ways :
1) Quick Find
2) Quick Union
3) Weighted Quick Union
4) Quick Union + Path Compression
5) Weighted Quick Union + Path Compression

Worst Case Complexities :
1. Quick Find - M * N
2. Quick Union - M * N
3. Weighted Quick Union - N + M log N
4. Quick Union + Path Compression - N + M log N
5. Weighted Quick Union + Path Compression - N + M lg N

Where, M is union find operations on set of N objects.

From the above, **Weighted quick union with path compression is best** to implement union find because the complexity to access the elements is less. The tree structure is more flat when compared to other algorithms. Huge difference can be seen where large number of objects are used.