```
Linear Search
  0   1   2   3   4   5   6   7   8   9  10  11  12  13  14
----------------------------------------------------
  1   3   5   7   9  11  13  15  17  19  21  23  25  27  29
Searching for 2.
  1   3   5   7   9  11  13  15  17  19  21  23  25  27  29
      3   5   7   9  11  13  15  17  19  21  23  25  27  29
          5   7   9  11  13  15  17  19  21  23  25  27  29
              7   9  11  13  15  17  19  21  23  25  27  29
                  9  11  13  15  17  19  21  23  25  27  29
                     11  13  15  17  19  21  23  25  27  29
                         13  15  17  19  21  23  25  27  29
                             15  17  19  21  23  25  27  29
                                 17  19  21  23  25  27  29
                                     19  21  23  25  27  29
                                         21  23  25  27  29
                                             23  25  27  29
                                                 25  27  29
                                                     27  29
                                                         29
Number 2 NOT found.
Linear Search
  0   1   2   3   4   5   6   7   8   9  10  11  12  13  14
----------------------------------------------------
  1   3   5   7   9  11  13  15  17  19  21  23  25  27  29
Searching for 27.
  1   3   5   7   9  11  13  15  17  19  21  23  25  27  29
      3   5   7   9  11  13  15  17  19  21  23  25  27  29
          5   7   9  11  13  15  17  19  21  23  25  27  29
              7   9  11  13  15  17  19  21  23  25  27  29
                  9  11  13  15  17  19  21  23  25  27  29
                     11  13  15  17  19  21  23  25  27  29
                         13  15  17  19  21  23  25  27  29
                             15  17  19  21  23  25  27  29
                                 17  19  21  23  25  27  29
                                     19  21  23  25  27  29
                                         21  23  25  27  29
                                             23  25  27  29
                                                 25  27  29
                                                     27  29
Number 27 found in position 13.
```

```
Binary Search
  0   1   2   3   4   5   6   7   8   9  10  11  12  13  14
-------------------------------------------------
Searching for 27.
  1   3   5   7   9  11  13  15  17  19  21  23  25  27  29 left= 0 right=14
                                 17  19  21  23  25  27  29 left= 8 right=14
                                             25  27  29 left=12 right=14
Number 27 found in position 13.
Binary Search
  0   1   2   3   4   5   6   7   8   9  10  11  12  13  14
-------------------------------------------------
Searching for 2.
  1   3   5   7   9  11  13  15  17  19  21  23  25  27  29 left= 0 right=14
  1   3   5   7   9  11  13                                 left= 0 right= 6
  1   3   5                                                 left= 0 right= 2
  1                                                         left= 0 right= 0
Number 2 NOT found.
```

Quick Find

			0	1	2	3	4	5	6	7	8	9	
(3-	2)	!=	0	1	2	**2**	4	5	6	7	8	9	all 3 to 2
(6-	4)	!=	0	1	2	2	4	5	**4**	7	8	9	
(3-	4)	!=	0	1	4	4	4	5	4	7	8	9	
(5-	2)	!=	0	1	4	4	4	4	4	7	8	9	
(6-	2)	=	0	1	4	4	4	4	4	7	8	9	
(0-	8)	!=	8	1	4	4	4	4	4	7	8	9	
(9-	1)	!=	8	1	4	4	4	4	4	7	8	1	
(3-	8)	!=	8	1	8	8	8	8	8	7	8	1	
(6-	4)	=	8	1	8	8	8	8	8	7	8	1	
(0-	5)	=	8	1	8	8	8	8	8	7	8	1	

1 level trees

```
Quick Union
               0   1   2   3   4   5   6   7   8   9
(  0-  2) != 2   1   2   3   4   5   6   7   8   9
(  2-  4) != 2   1   4   3   4   5   6   7   8   9
(  5-  1) != 2   1   4   3   4   1   6   7   8   9
(  4-  8) != 2   1   4   3   8   1   6   7   8   9
(  7-  3) != 2   1   4   3   8   1   6   3   8   9
(  5-  9) != 2   9   4   3   8   1   6   3   8   9
(  9-  4) != 2   9   4   3   8   1   6   3   8   8
(  5-  6) != 2   9   4   3   8   1   6   3   6   8
(  6-  3) != 2   9   4   3   8   1   3   3   6   8
(  3-  5)  = 2   9   4   3   8   1   3   3   6   8
```

Quick Union <mark>Weighted</mark>

	0	1	2	3	4	5	6	7	8	9
(0- 2) !=	0	1	0	3	4	5	6	7	8	9
(2- 4) !=	0	1	0	3	0	5	6	7	8	9
(5- 1) !=	0	5	0	3	0	5	6	7	8	9
(4- 8) !=	0	5	0	3	0	5	6	7	0	9
(7- 3) !=	0	5	0	7	0	5	6	7	0	9
(5- 9) !=	0	5	0	7	0	5	6	7	0	5
(9- 4) !=	0	5	0	7	0	0	6	7	0	5
(5- 6) !=	0	5	0	7	0	0	0	7	0	5
(6- 3) !=	0	5	0	7	0	0	0	0	0	5
(3- 5) =	0	5	0	7	0	0	0	0	0	5

small tree to larger one