

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.

Linear Search (in sorted array)

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 18.

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

Number 18 NOT found.

## Binary 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 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

-----

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 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 Union

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

# Quick Union Weighted

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