

Report

- Keeping the range as 100000, and taking 5 inputs:

Here, as size of array increase time increase

$$O(n^2)$$

N	100000						
1000	% time	cumulative seconds	self seconds	calls	self Ts/call	total Ts/call	na
	0.00	0.00	0.00	1000	0.00	0.00	is
	0.00	0.00	0.00	1	0.00	0.00	la
	0.00	0.00	0.00	1	0.00	0.00	ra
10000	% time	cumulative seconds	self seconds	calls	self ms/call	total ms/call	na
	100.00	0.06	0.06	10000	0.01	0.01	is
	0.00	0.06	0.00	1	0.00	60.00	la
	0.00	0.06	0.00	1	0.00	0.00	ra
100000	97.37	0.37	0.37	100000	0.00	0.00	is
	2.63	0.38	0.01	1	10.00	380.00	la
	0.00	0.38	0.00	1	0.00	0.00	ra
1000000	100.00	4.08	4.08	1000000	0.00	0.00	i
	0.00	4.08	0.00	1	0.00	4.08	l
	0.00	4.08	0.00	1	0.00	0.00	r
10000000	99.61	40.90	40.90	10000000	0.00	0.00	is_
	0.27	41.01	0.11	1	0.11	0.11	rar
	0.12	41.06	0.05	1	0.05	40.95	lar

2. Keeping $N = 1000000$ and varying range

Time increase

$O(n^2)$

Range	N = 1000000					
1000	Time	seconds	seconds	calls	ms/call	ms/call
	100.00	0.29	0.29	1000000	0.00	0.00
	0.00	0.29	0.00	1	0.00	290.00
	0.00	0.29	0.00	1	0.00	0.00
10000	99.31	1.43	1.43	1000000	0.00	0.00
	0.69	1.44	0.01	1	0.01	0.01
	0.00	1.44	0.00	1	0.00	1.43
100000	99.28	4.16	4.16	1000000	0.00	0.00
	0.48	4.18	0.02	1	0.02	4.18
	0.24	4.19	0.01	1	0.01	0.01
10	50.00	0.01	0.01	1000000	0.00	0.00
	50.00	0.02	0.01	1	10.00	20.00
	0.00	0.02	0.00	1	0.00	0.00
100	88.46	0.12	0.12	1000000	0.00	0.00
	7.69	0.12	0.01	1	10.00	125.00
	3.85	0.13	0.01	1	5.00	5.00

3. Efficient Range as 100000:

Time Increase

N	Range 100000
---	--------------

10	0.00	0.00	0.00	10	0.00	0.00
	0.00	0.00	0.00	1	0.00	0.00
	0.00	0.00	0.00	1	0.00	0.00
100	0.00	0.00	0.00	100	0.00	0.00
	0.00	0.00	0.00	1	0.00	0.00
	0.00	0.00	0.00	1	0.00	0.00
1000	0.00	0.00	0.00	1000	0.00	0.00
	0.00	0.00	0.00	1	0.00	0.00
	0.00	0.00	0.00	1	0.00	0.00
10000	time	seconds	seconds	calls	ts/call	ts/call
	0.00	0.00	0.00	10000	0.00	0.00
	0.00	0.00	0.00	1	0.00	0.00
	0.00	0.00	0.00	1	0.00	0.00
100000	100.00	0.01	0.01	100000	0.00	0.00
	0.00	0.01	0.00	1	0.00	10.00
	0.00	0.01	0.00	1	0.00	0.00

4. Efficient N = 1000000:

Time Increase

N = 1000 000, Range						
10	50.00	0.02	0.02	1000000	0.00	0.00
	25.00	0.03	0.01	1	10.00	10.00
	25.00	0.04	0.01	1	10.00	10.00

100	58.33	0.04	0.04	1000000	0.00	
	25.00	0.05	0.01	1	15.00	
	16.67	0.06	0.01	1	10.00	
1000	68.75	0.06	0.06	1000000	0.00	0.00
	31.25	0.08	0.03	1	25.00	25.00
	0.00	0.08	0.00	1	0.00	55.00
1000 0	83.33	0.10	0.10	1000000	0.00	
	8.33	0.11	0.01	1	10.00	10.00
	8.33	0.12	0.01	1	10.00	10.00
1000 00	50.00	0.03	0.03	1000000	0.00	
	33.33	0.05	0.02	1	20.00	
	16.67	0.06	0.01	1	10.00	