Observation:

Array Size	Cutoff	Time (millisecond)
200	100	12
400	200	19
800	400	12
1000	500	8
2000	1000	8
5000	2500	15
10000	5000	20

As we see by the readings, we can conclude that as with the increase in the array size performance is increases. Initially when the array size is small system took more time to sort but if be continuously increase the size of the array after certain size we can find that eventually, it will take less time to sort the array and on further increase in the size of the array the time taken to sort the array increases by very small amount.

In my case, the ideal cutoff point is between 800-1000 as in between these sizes the time eventually decreases for sorting a longer array.

Screen shot:

Code Success :

```
-------------------------------------------------------------------
] Building INFO6205 1
-------------------------------------------------------------------

] --- exec-maven-plugin:1.2.1:exec (default-cli) @ INFO6205 ---
 final result:  [11, 12, 22, 23, 29, 31, 31, 32, 33, 40, 48, 51, 61, 63, 67, 77, 78, 81, 84,
· Success!
-------------------------------------------------------------------
 BUILD SUCCESS
-------------------------------------------------------------------
 Total time: 2.539s
 Finished at: Thu Mar 15 13:23:49 EDT 2018
 Final Memory: 5M/123M
-------------------------------------------------------------------
```

Readings :

```
 Array Size : 200,  Cut off : 100
- Sort Time: 12 MiliSec
 -------------------------------------------------------------------
 BUILD SUCCESS
 -------------------------------------------------------------------
 Total time: 1.084s
 Finished at: Thu Mar 15 13:43:56 EDT 2018
 Final Memory: 5M/123M
 -------------------------------------------------------------------


 Array Size : 400,  Cut off : 200
 Sort Time: 19 MiliSec
 -------------------------------------------------------------------
 BUILD SUCCESS
 -------------------------------------------------------------------
 Total time: 1.187s
 Finished at: Thu Mar 15 13:45:06 EDT 2018
 Final Memory: 5M/123M
 -------------------------------------------------------------------


 Array Size : 800,  Cut off : 400
 Sort Time: 12 MiliSec
· Success!
 -------------------------------------------------------------------
 BUILD SUCCESS
 -------------------------------------------------------------------
 Total time: 1.071s
 Finished at: Thu Mar 15 13:46:25 EDT 2018
 Final Memory: 5M/123M
 -------------------------------------------------------------------
```

```
Array Size : 1000,  Cut off : 500
Sort Time: 8 MiliSec
Success!
------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------
Total time: 1.036s
Finished at: Thu Mar 15 13:47:50 EDT 2018
Final Memory: 5M/123M
------------------------------------------------------------------



Array Size : 2000,  Cut off : 1000
Sort Time: 8 MiliSec
Success!
------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------
Total time: 1.018s
Finished at: Thu Mar 15 13:48:32 EDT 2018
Final Memory: 5M/123M
------------------------------------------------------------------




Array Size : 5000,  Cut off : 2500
Sort Time: 15 MiliSec
-------------------------------------------------------------------
BUILD SUCCESS
-------------------------------------------------------------------
Total time: 1.042s
Finished at: Thu Mar 15 13:49:17 EDT 2018
Final Memory: 5M/123M
-------------------------------------------------------------------


]--- exec-maven-plugin:1.2.1:exec (default-cli) @ INFO6205 ---
Array Size : 10000,  Cut off : 5000
Sort Time: 20 MiliSec
-------------------------------------------------------------------
BUILD SUCCESS
-------------------------------------------------------------------
Total time: 1.132s
Finished at: Thu Mar 15 13:50:02 EDT 2018
Final Memory: 5M/123M
-------------------------------------------------------------------
```