

# Runtime Complexity of *push* vs. *unshift*

Runtime Results	insert <i>f</i>	append <i>f</i>
extraLargeArray	757.0312 ms	2.3406 ms
largeArray	7.1789 ms	452 $\mu$ s
mediumArray	127.1 $\mu$ s	123.8 $\mu$ s
smallArray	34.3 $\mu$ s	82 $\mu$ s
tinyArray	28.1 $\mu$ s	70.5 $\mu$ s

The runtime test demonstrates that the *append* function scales much better than *insert*. That is because the *push* method only inserts an element at the end of the array, versus the *unshift* method which also has to increment all the existing elements in the array.

Thus, the runtime complexity of **push()** is constant —  **$O(1)$**  — whereas the runtime complexity of **unshift()** is linear —  **$O(n)$**  — taking longer to run the bigger the array size gets.