

Time Complexity of building a heap

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Consider the following algorithm for building a Heap of an input array A.

```
BUILD-HEAP(A)
  heapsize := size(A);
  for i := floor(heapsize/2) downto 1
    do HEAPIFY(A, i);
  end for
END
```

What is the worst case time complexity of the above algo?

Although the worst case complexity looks like $O(n \log n)$, upper bound of time complexity is $O(n)$. See following links for the proof of time complexity.

<http://www.cse.iitk.ac.in/users/sbaswana/Courses/ESO211/heap.pdf/>

http://www.cs.sfu.ca/CourseCentral/307/petra/2009/SLN_2.pdf