Algorithms – Q6 [M] (20/11/23)

n items are to be packed in bins (all of a certain - unspecified - size) using the First Fit Decreasing algorithm. If the number of comparisons is to be used as a measure of the complexity of the algorithm, determine this complexity in the worst case.

Solution

In the worst case, each bin contains only one item (to maximise the number of comparisons).

So total number of comparisons is $1 + 2 + \cdots + (n-1)$

$$= \frac{1}{2}(n-1)n$$

and the order is quadratic; or $O(n^2)$.