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Unit 5
Module 2

Ex. 2.4

Running the program with both approaches on my computer, I got the following results:

- First Approach Time: 135 - 136
- Second Approach Time: 1 - 2

Obviously, the first approach is much slower than the second one. In the first approach, the time complexity is determined by (or proportional to) the number of elements in the hashset **directors** multiplied by the number of elements in the array list **movies**:

> **directors.size() x movies.size()**.

The speed of the second approach is proportional to only **movies.size()**. In the one loop traversing movies, each director is checked and added to the hashmap movieCount. To check whether the director has already been added and, if necessary, to increase this director's movie count, the map is queried during each iteration. However, because the time for querying a hash collection is constant, it hardly increases the execution time of this approach:

> **movies.size() x 1**.

Ex. 2.5

With Approach 1:

- time for actor-movie count: 72485
- time for sort: 19457

Ex. 2.6

With Approach 2 (based on a hashmap):

- time for actor-movie count: 60
- time for sort: 20995

Ex. 2.7

- time for sort: 10