Solution

We can use the book's solution for Vertex Cover to help solve this problem. We begin by considering an element $a \in A$ and note that we can reduce the problem by deleting it and then deleting all subsets B_i that contain a. Consider any subset B_i of A: it contains elements $x_1....x_c$ and one of these must be in H. If we remove B_i from our problem space, then we can remove that element x_i that is in our solution H. Consider a $k - element$ solution H to the hitting set problem. If we reduce the problem by a, and remove an element x_i, we now have a solution of size $k - 1$. So, to solve this problem, we pick a random subset B_i and recursively check if when we reduce the problem by x_i we get an H of size $k - 1$. The running time on this is the same as that of our Vertex Cover algorithm, and is $O(2^k * kn)$.