Assignment 1: CLRS Problem 35-3

Weighted Set-Covering Problem. Suppose that we generalize the set-covering problem so that each set S_i in the Family $\mathcal{F}$ has an associated weight w_i and the weight of a cover $\mathcal{C}$ is $\sum_{S_i \in \mathcal{C}} w_i$. We wish to determine a minimum-weight cover. (Section 35.3 handles the case in which $w_i = 1$ for all i.)

Show how to generalize the greedy set-covering heuristic in a natural manner to provide an appropriate solution for any instance of the weighted set-covering problem.

Show that your heuristic has an approximation ratio of $H(d)$, where d is the maximum size of any set S_i.