0.1 Greedy Algorithm

Algorithm 1 Greedy algorithm

Let $(E, \mathscr{S})$ be an independence system and $\omega : E \longrightarrow \mathbb{R}^+$

procedure GREEDY$(E, \mathscr{S}, \omega, T)$
    order the elements of E according to their weight
    $E = \{e_1, ..., e_m\}$ with $\omega(e_1) \geq \omega(e_2) \geq ... \geq \omega(e_m)$
    $T \leftarrow \emptyset$
    for $k = 1$ to m **do**
        if $T \cup \{e_k\} \in \mathscr{S}$ **then**
            append e_k to T
        end if
    end for
end procedure

Algorithm 2 Greedy algorithm

The *greedy algorithm* for the pair $(\mathscr{I}, \omega)$ is as follows:

procedure GREEDY$(\mathscr{I}, \omega)$
    Set $x_0 = \emptyset$ and $j = 0$
    if $\exists e \in E \setminus x_j$ such that $x \cup \{e\} \in \mathscr{I}$ **then**
        Choose such an element e_{j+1} of maximum weight,
        let $x_{j+1} = x_j \cup \{e_{j+1}\}$ and **Break**
    else
        Let $x_j = B_G$
        return x_j
    end if
    $j++$
end procedure