Consider the procedure `prune` (from the lecture notes, with numbering for `S` and `W` corresponding to the iterations).

```
procedure prune(O,W,G);
  i := 0;
  W_0 := W;
repeat
  i := i + 1;
  k := 0;
  S_0 := \emptyset;  (* States from which `G` is reachable with 0 steps. *)
  repeat
    k := k + 1;
    S_k := S_{k-1} \cup \bigcup_{o \in O}(\text{upreimg}_o(S_{k-1} \cup G) \cap \text{spreimg}_o(W_{i-1} \cup G));  (* States from which `G` is reachable with `k` steps. *)
  until S_k = S_{k-1};  (* States that stay within `W_{i-1}` and eventually reach `G`. *)
  W_i := W_{i-1} \cap S_k;  (* States in `W_i` stay within `W_i` and eventually reach `G`. *)
until W_i = W_{i-1};
return W_i;
```

Consider the following transition graph (only one action `o`, which is nondeterministic in states `e` and `c`).

![Transition Graph](image-url)

Simulate the computation of `prune` when it is called with the following parameters: `prune(\{o\}, \{a, b, c, d, e, f\}, \{a\})`. List the values of `S_k` and `W_i` for different values of `k` and `i`. 
Exercise 8.2 (Algorithm – 5 credits)
Simulate the computation of the algorithm for maintenance goals for the following graph (there is only one action) and $G = \{a, b, c, d, e, f\}$.

You may work on these assignments and submit your results in groups of two students. Make sure to clearly indicate both names on your work. You may write your answers in English or German. Please return your homework on Monday before 14:15.
Exercise marks count towards your final grade for this course, which is calculated from exercise marks (15%) and exam marks (85%).