- 1. Consider the algorithm Büchi-win in Figure 3.1 (Page 79) of the text. Design a game G for which Büchi-win makes at least 2 recursive calls.
- 2. Design a game G with O(n) vertices for which Büchi-win makes at least n recursive calls.
- 3. Consider the following algorithm for the mixed Büchi and co-Büchi objective: two disjoint sets T and S are specified; Player 1 wins plays that visit T infinitely often and S only finitely often.

```
algorithm mixed-win(G)
1
         if reach_1(T) = V and S = \emptyset
2
        then (W_0, W_1) = (\emptyset, V)
3
         else
4
              W'_0 = V \setminus reach_1(T)
\mathbf{5}
              G' = V \setminus reach_0(W'_0)
6
              (W_0'',W_1'') = \mathsf{mixed-win}(G'')
\overline{7}
              (W_0, W_1) = (V \setminus W_1'', W_1'')
8
         endif
9
        return (W_0, W_1)
10
```

Give an example of a game graph on which the above algorithm does not terminate.