
Algorithm 5: Angluin's algorithm

Input: A teacher for a regular language $L \subseteq \Sigma^*$

```
1 Initialize an empty observation table  $O = (R, S, T)$  with  $R = \{\varepsilon\}$  and  $S = \{\varepsilon\}$ 
2  $update(O)$  // Invokes a membership query
3 repeat
4   while  $O$  is not closed or not consistent do
5     if  $O$  is not closed then
6       Pick  $u \in R$  and  $a \in \Sigma$  with  $\llbracket ua \rrbracket_O \cap R = \emptyset$ 
7        $R \leftarrow R \cup \{ua\}$ 
8        $update(O)$  // Invokes membership queries
9     else if  $O$  is not consistent then
10      Pick  $u \sim_O v \in R$ ,  $a \in \Sigma$ , and  $w \in S$  with  $T(uaw) \neq T(vaw)$ 
11       $S \leftarrow S \cup \{aw\}$ 
12       $update(O)$  // Invokes membership queries
13    end
14  end
15  Construct  $\mathcal{A}_O$  and perform an equivalence query
16  if the teacher replies with a counterexample  $u$  then
17     $R \leftarrow R \cup Pref(\{u\})$ 
18     $update(O)$  // Invokes membership queries
19  end
20 until the teacher replies "yes" to an equivalence query with  $\mathcal{A}_O$ 
21 return  $\mathcal{A}_O$ 
```
