

---

**Algorithm 1** Open Definability Algorithm

---

```
1: function ISOPENDEF(A, R, T)
2:    $\triangleright$  A: relational model, R: Base relations symbols, T: Target relations
   symbols
3:   spectrum = calculateSpectrum(A,T)
4:   global  $\mathcal{S} = \emptyset$ 
5:   if spectrum = [] then
6:     return True
7:   end if
8:   for  $\mathbf{A}_0 \in \text{submodels}(\mathbf{A}, \text{head}(\text{spectrum}))$  do
9:     if not isOpenDefR(A, R, T, tail(spectrum)) then
10:      return False
11:    end if
12:  end for
13:  return True
14: end function

15: function ISOPENDEFR(A, R, T, spectrum)
16:   if  $\mathbf{A}_R \cong \mathbf{S}_R$ , where  $\mathbf{S} \in \mathcal{S}$  by  $\gamma$  then
17:      $\triangleright \gamma$  iso from  $\mathbf{A}_R$  to  $\mathbf{S}_R$ 
18:      $\triangleright \mathbf{A}$  is represented by  $\mathbf{S}$  in  $\mathcal{S}$ 
19:     if  $\gamma$  preserves T then
20:       return True
21:     else
22:       return False
23:     end if
24:   for  $\gamma \in \text{aut}(\mathbf{A}_R)$  do
25:     if  $\gamma$  not preserves T then
26:       return False
27:     end if
28:   end for
29:    $\mathcal{S} = \mathcal{S} \cup \{\mathbf{A}\}$ 
30:   if spectrum = [] then
31:     return True
32:   end if
33:   for  $\mathbf{A}_0 \in \text{submodels}(\mathbf{A}, \text{head}(\text{spectrum}))$  do
34:     if not isOpenDefR( $\mathbf{A}_0$ , tail(spectrum)) then
35:       return False
36:     end if
37:   end for
38: end function
```

---