

0.1 Type Ambiguity Error Handler

0.1.1 Handler Algorithm

Algorithm 1: Handle

```
Input: L, B, R, M
1  $ID_L \leftarrow \{n \in A_L \mid n.type = IMPORTDECL\};$ 
2  $ID_R \leftarrow \{n \in A_R \mid n.type = IMPORTDECL\};$ 
3 if  $ID_L = \emptyset \vee ID_R = \emptyset$  then return;
4  $M_U \leftarrow \text{textualMerge}(\text{treeToText}(L), \text{treeToText}(B), \text{treeToText}(R));$ 
5  $I_L, I_R \leftarrow \text{extractInsertions}(M_U);$ 
6  $cs \leftarrow \text{extractConflicts}(M_U);$ 
7  $c \leftarrow \text{compile}(M_U);$ 
8  $ps \leftarrow \text{problems}(c);$ 
9 foreach  $l \in ID_L$  do
10    $m_l \leftarrow \text{extractPackageMember}(l.body);$ 
11   foreach  $r \in ID_R$  do
12      $m_r \leftarrow \text{extractPackageMember}(r.body);$ 
13     if  $m_l = m_r$  then
14        $p \leftarrow \text{importDeclarationsProblem}(l, r, ps);$ 
15       if  $p \neq \text{null}$  then
16          $m \leftarrow \text{find}(m \in M \rightarrow m.body = l.body);$ 
17          $m.body \leftarrow \text{conflict}(l.body, \varepsilon, r.body);$ 
18          $m \leftarrow \text{find}(m \in M \rightarrow m.body = r.body);$ 
19          $\text{removeNode}(m, M);$ 
20          $ps \leftarrow ps - p;$ 
21         break;
22     end
23   else if  $(m_l = * \vee m_r = *) \wedge \text{importDeclarationsConflict}(l, r, cs)$  then
24      $I \leftarrow I_L;$ 
25      $m \leftarrow m_r;$ 
26     if  $m_l \neq *$  then
27        $I \leftarrow I_R;$ 
28        $m \leftarrow m_l;$ 
29     end
30      $i \leftarrow \text{find}(i \in I \rightarrow \text{import} \notin i \wedge m \in i);$ 
31     if  $i \neq \text{null}$  then
32        $m \leftarrow \text{find}(m \in M \rightarrow m.body = l.body);$ 
33        $m.body \leftarrow \text{conflict}(l.body, \varepsilon, r.body);$ 
34        $m \leftarrow \text{find}(m \in M \rightarrow m.body = r.body);$ 
35        $\text{removeNode}(m, M);$ 
36       break;
37     end
38   end
39 end
40 end
```

Algorithm 2: Import Declarations Problem**Input:** l , r , ps **Output:** compilation problem in ps concerning l and r import declarations, if there is one

```
1 foreach  $p \in ps$  do
2   if  $p.type = COLLISION$  then
3     foreach  $a \in p.arguments$  do
4       if  $a \in l.body \vee a \in r.body$  then return  $p$ ;
5     end
6   else if  $p.type = AMBIGUITY$  then return  $p$ ;
7 end
8 return  $null$ ;
```

Algorithm 3: Import Declarations Conflict**Input:** l , r , cs **Output:** whether there is a unstructured conflict in cs concerning l and r import declarations

```
1 foreach  $c \in cs$  do
2   if  $l.body \in c.left \wedge r.body \in c.right$  then return  $TRUE$ ;
3 end
4 return  $FALSE$ ;
```