

NEXTPIVOT:

```
if  $\text{pred}(u) \neq s$ 
    return 1

if  $\text{pred}(v) \neq s$ 
     $d \leftarrow s \rightarrow v$ 
     $\Delta \leftarrow \text{GETSLACK}(d^*)$ 
else
     $d^* \leftarrow \text{MINPATHSLACK}(o^*, p^*)$ 
     $\Delta \leftarrow \text{GETSLACK}(d^*)/2$ 

if  $\lambda + \Delta/w(uv) < 1$ 
    PIVOT( $d, \Delta$ )
    return  $\lambda + \Delta/w(uv)$ 
else
    return 1
```

PIVOT($x \rightarrow y, \Delta$):

⟨⟨Update distances⟩⟩

```
if  $\text{pred}(u) = s$  then ADDSUBTREEDIST( $\Delta, u$ )
if  $\text{pred}(v) = s$  then ADDSUBTREEDIST( $-\Delta, v$ )
```

⟨⟨Update slacks⟩⟩

```
ADDPATHSLACK( $-\Delta, o^*, p^*$ )
```

⟨⟨Update primal and dual trees⟩⟩

```
 $z \leftarrow \text{pred}(y)$ 
```

```
 $\text{pred}(y) \leftarrow x$ 
```

```
CUT( $zy$ )
```

```
JOIN( $x, y$ )
```

```
CUT( $(xy)^*$ )
```

```
JOIN( $(z \rightarrow y)^*, 0, w(yz)$ )
```