**Algorithm 9:** Bipartite Matching

**Input**: undirected bipartite graph $G = (S \uplus T, E)$

**Output**: maximal matching $M$

// Construct a flow network:

1   $V \leftarrow S \cup T \cup \{s, t\}$

2   $A_1 \leftarrow \{(s, v) \mid v \in S\}$

3   $A_2 \leftarrow \{(v, w) \mid \{v, w\} \in E\}$

4   $A_3 \leftarrow \{(w, t) \mid w \in T\}$

5   $A \leftarrow A_1 \cup A_2 \cup A_3$

6   $D \leftarrow (V, A)$

7   **foreach** $a \in A$ **do**

8     $c(a) \leftarrow 1$

// Use Edmonds-Karp:

9   $f \leftarrow$ maximal flow on $(D, s, t, c)$

// Find the matching:

10   $M \leftarrow \emptyset$

11   **foreach** $a \in A_2$ **do**

12     **if** $f(a) > 0$ **then**

13       $M \leftarrow M \cup \{a\}$