

$M_1 = \{(a_2, p_1), (a_3, p_2), (a_4, p_5)\}$

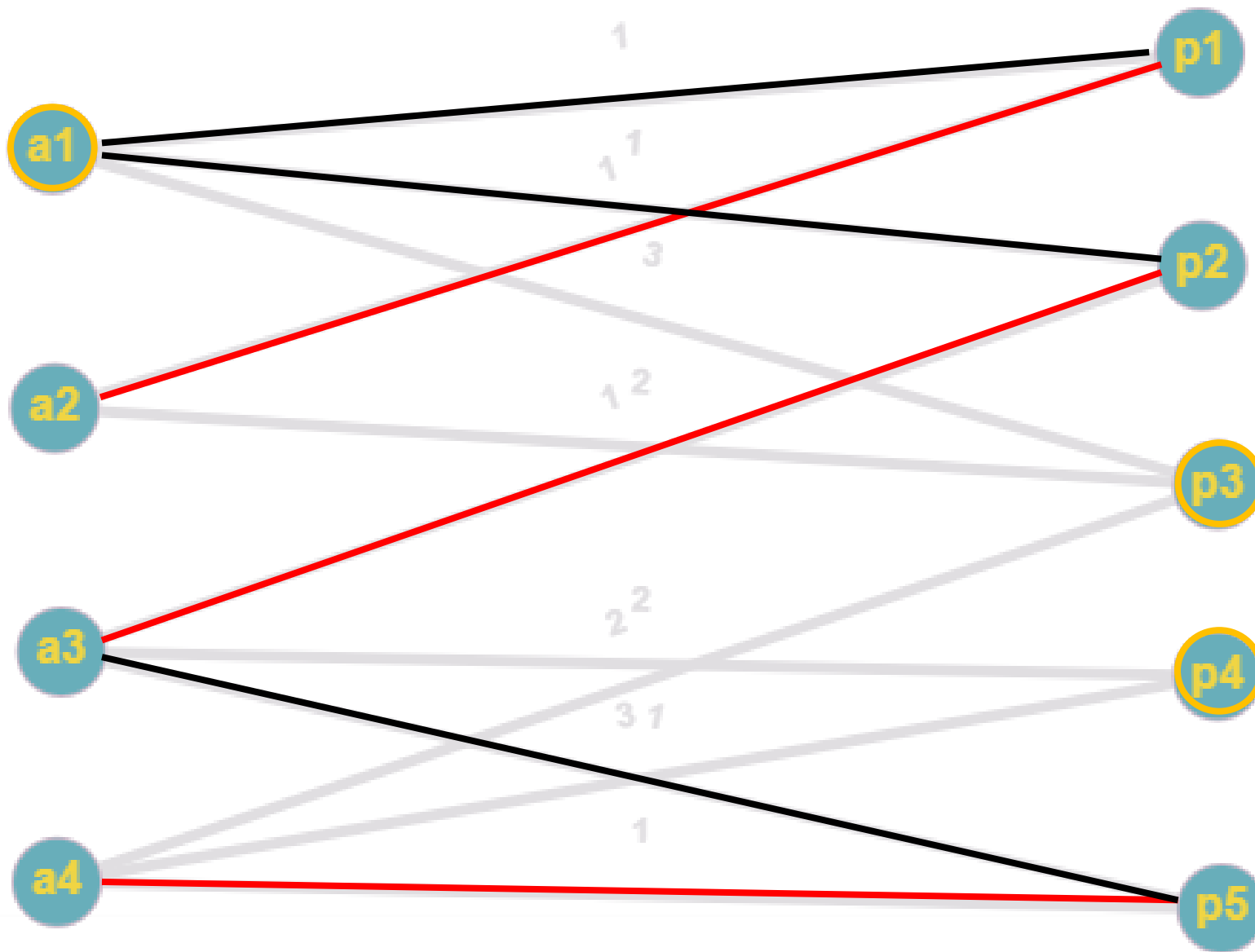
Free vertices = a_1, p_3, p_4

$EV_1 = \{a_1, p_3, p_4, a_2, a_3, a_4\}$

$O_1 = \{p_1, p_2, p_5\}$

$U_1 = \{\}$

Delete all edges with the rank higher than 1 that incident to nodes that are in O_1 Union U_1 . In addition we will delete all the edges from $O_1 O_1$ $O_1 U_1$



$M_1 = \{(a_2, p_1), (a_3, p_2), (a_4, p_5)\}$

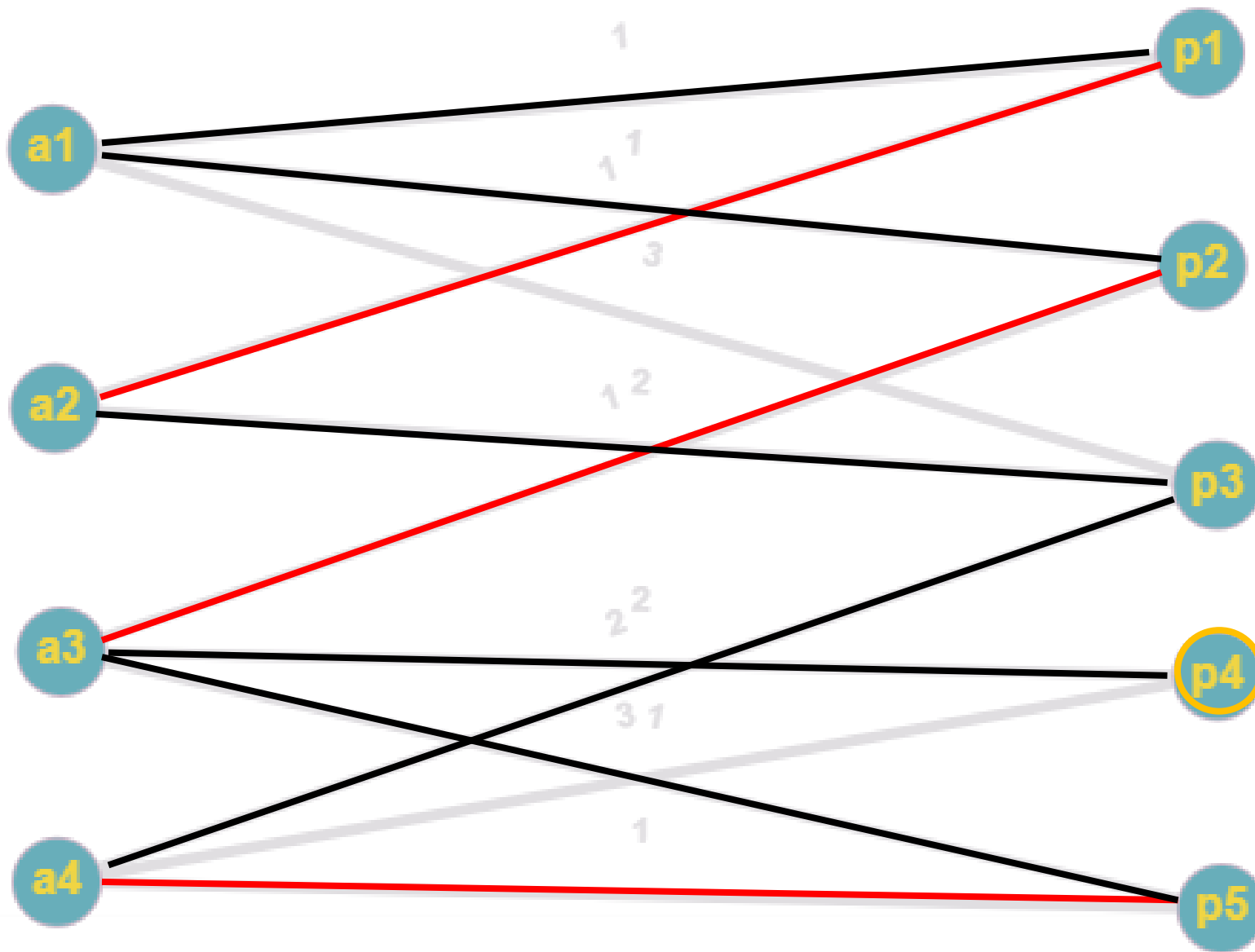
Free vertices = a_1, p_3, p_4

$EV_1 = \{a_1, p_3, p_4, a_2, a_3, a_4\}$

$O_1 = \{p_1, p_2, p_5\}$

$U_1 = \{\}$

We will add the edges with rank 2 to the graph.



$M_1 = \{(a_2, p_1), (a_3, p_2), (a_4, p_5)\}$

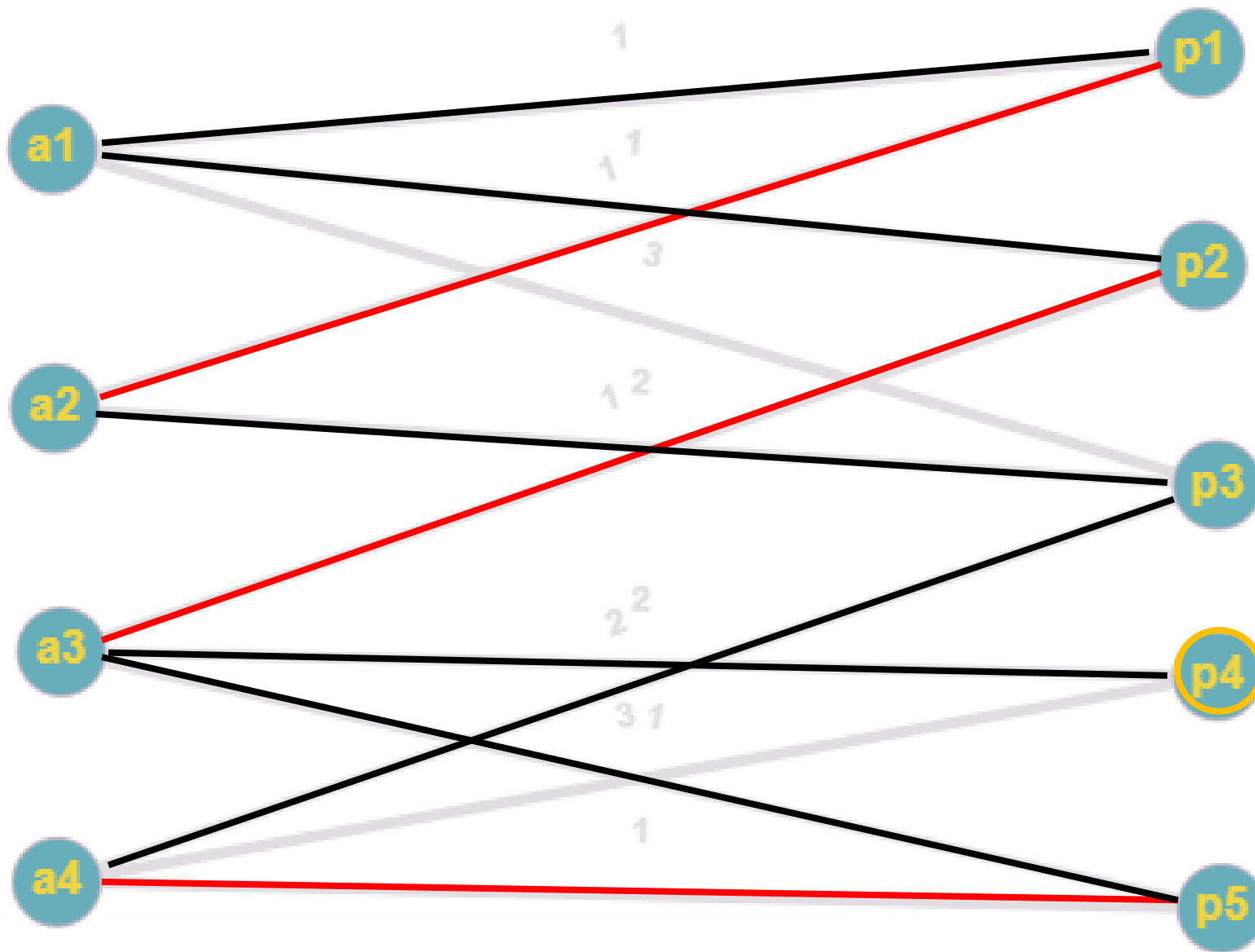
Free vertices = a_1, p_3, p_4

$EV_1 = \{a_1, p_3, p_4, a_2, a_3, a_4\}$

$O_1 = \{p_1, p_2, p_5\}$

$U_1 = \{\}$

We will look for an augmenting path.



$M_1 = \{(a_2, p_1), (a_3, p_2), (a_4, p_5)\}$

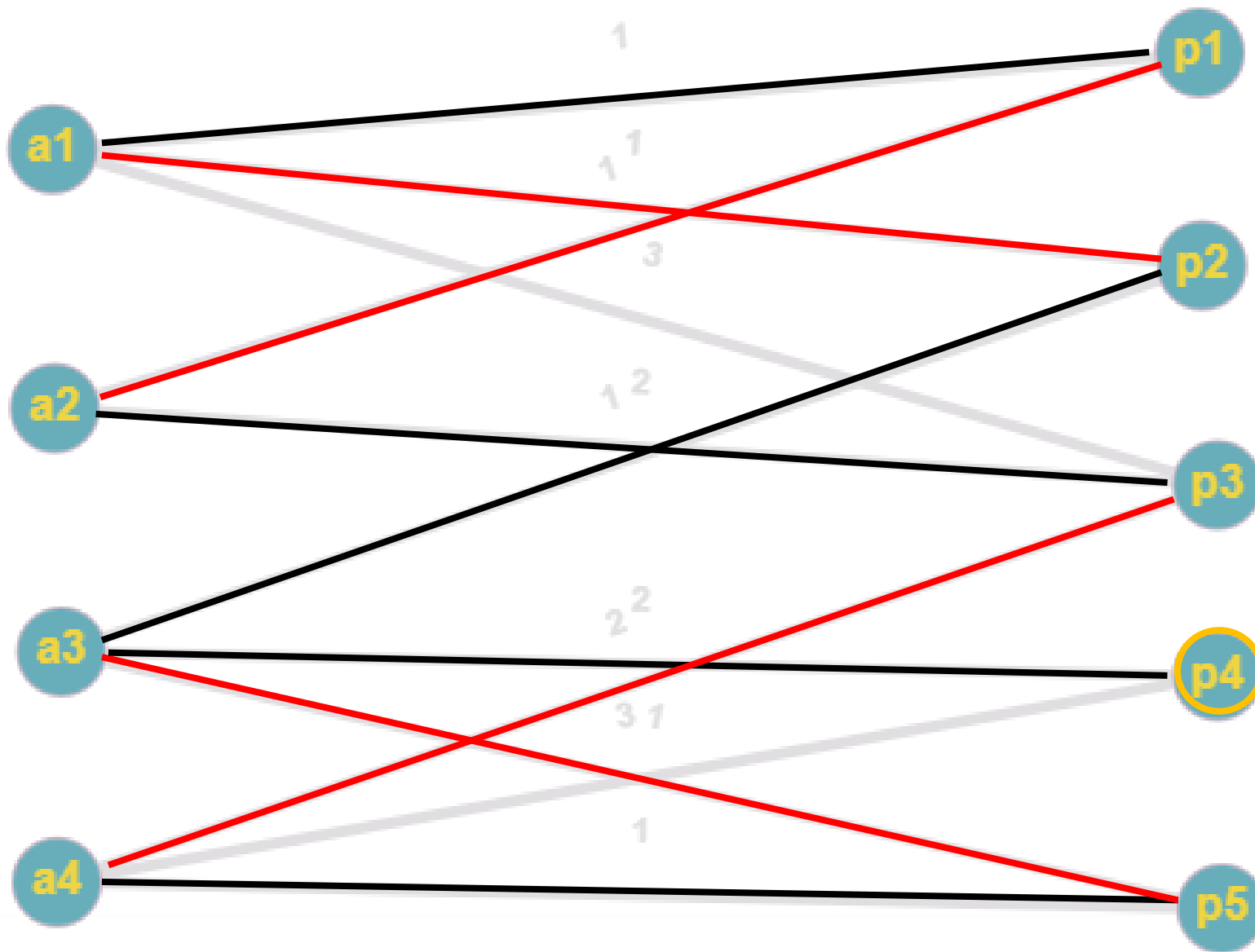
Free vertices = a_1, p_3, p_4

$EV_1 = \{a_1, p_3, p_4, a_2, a_3, a_4\}$

$O_1 = \{p_1, p_2, p_5\}$

$U_1 = \{\}$

We found a 5 length augmenting path. Now we take the symmetric difference as the new match.



$M_1 = \{(a_2, p_1), (a_3, p_2), (a_4, p_5)\}$

Free vertices = a_1, p_3, p_4

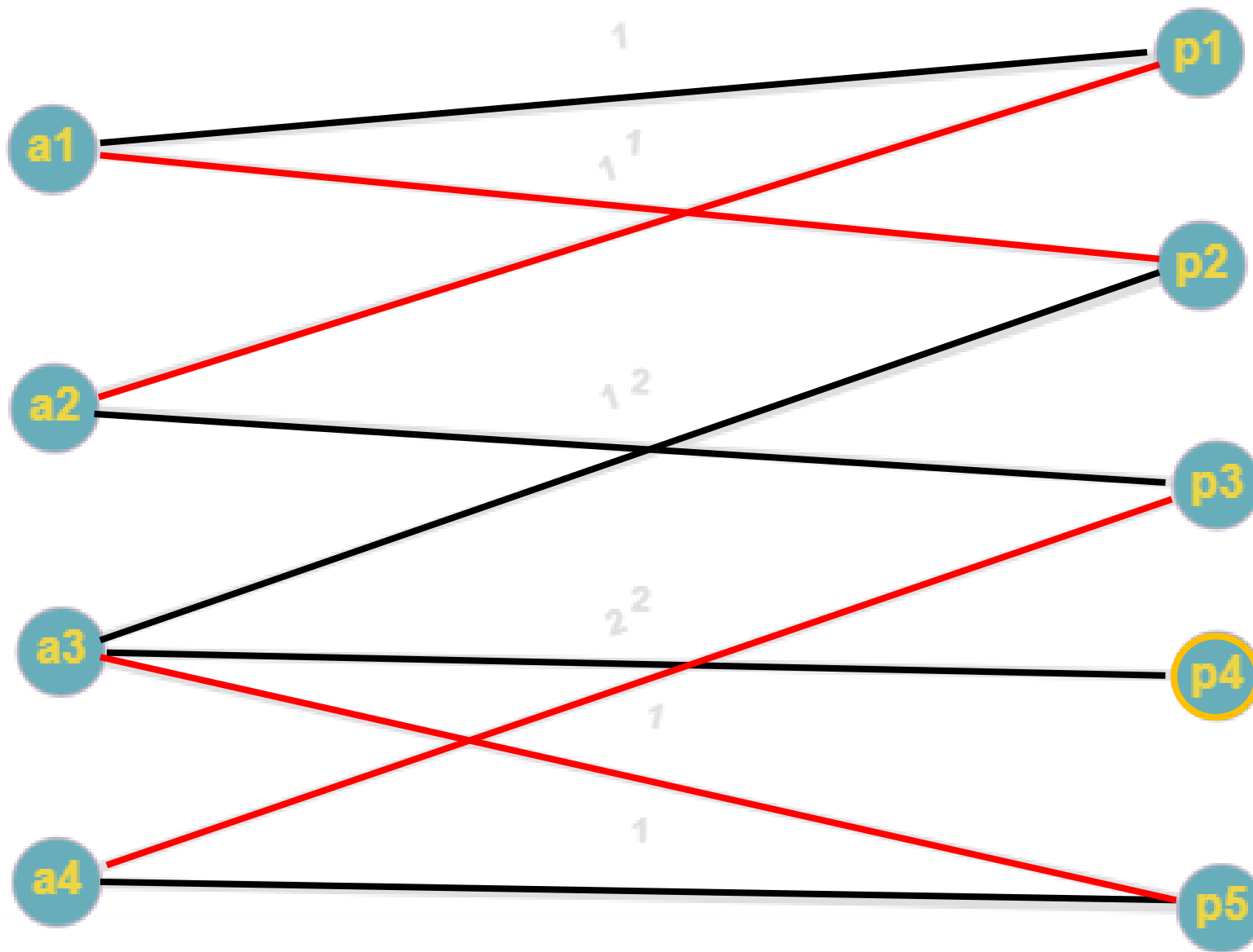
$EV_1 = \{a_1, p_3, p_4, a_2, a_3, a_4\}$

$O_1 = \{p_1, p_2, p_5\}$

$U_1 = \{\}$

The new matching is:

$M_2 = \{(a_1, p_2), (a_2, p_1), (a_3, p_5), (a_4, p_3)\}$



$M_2 = \{(a_1, p_2), (a_2, p_1), (a_3, p_5), (a_4, p_3)\}$

Free vertices = p_4

$EV_2 = \{p_4, p_5, p_3, p_1, p_2\}$

$O_2 = \{a_1, a_2, a_3, a_4\}$

$U_2 = \{\}$

There are no additional edges that can be added to the current graph, so there is no way to increase the matching.