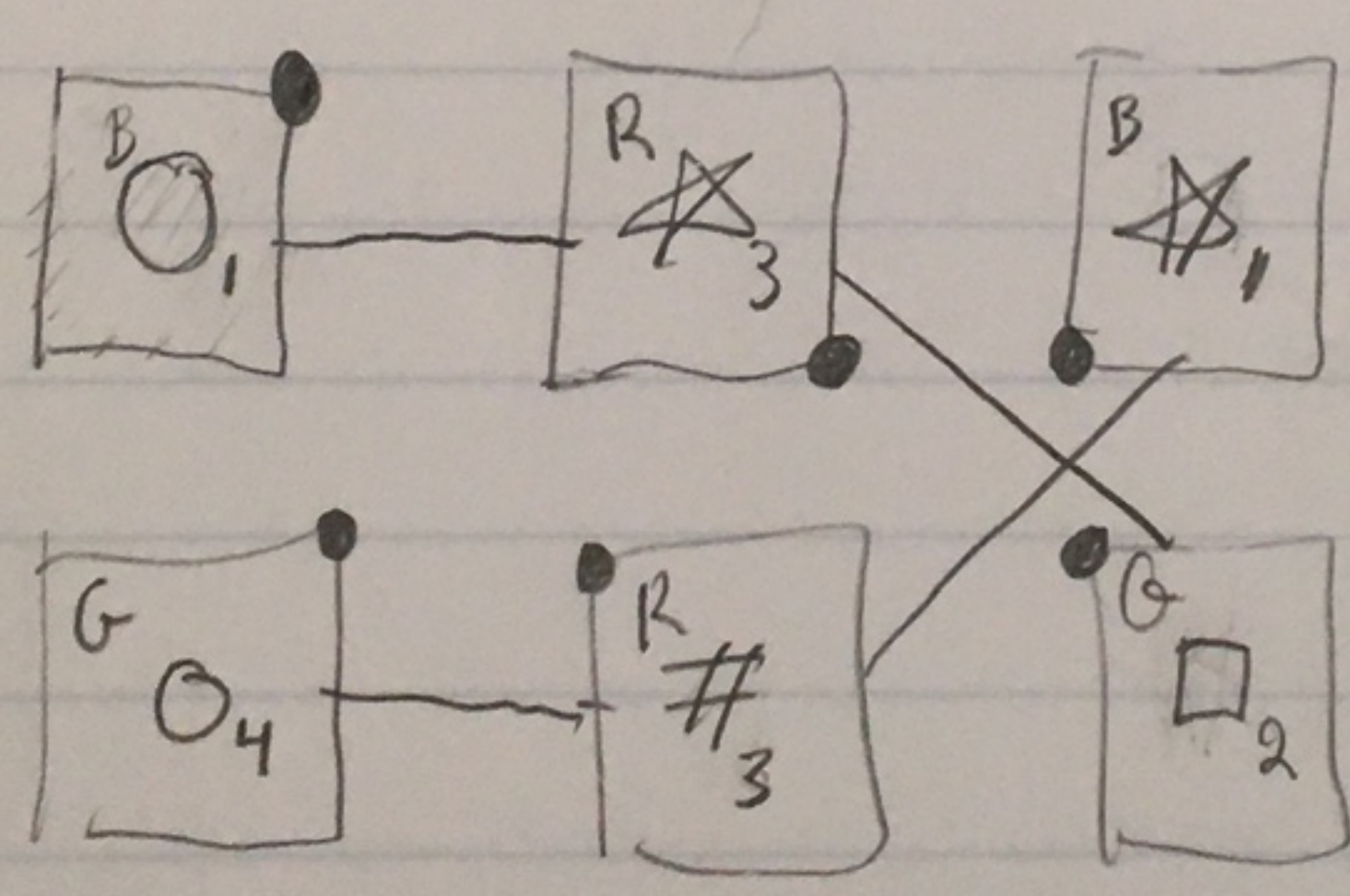
Reduction K-Dimensional Matching to Set Game.

① K-Dimensional Matching: Given a graph and a set of possible matches, M is a subset of those matches:
$M \subseteq \{1 \dots v\}^K$ where $v > 0$ and $K = \#$ of dimensions.
Is there a perfect match such that $|M| = v$?

② Set Game: Given a set of cards with 4 properties each, is there a perfect match of all cards such that no match shares more than one property.

Example:



Where the "propoerties" are = ① middle shape, ② Color Value $\{G, R, B\}$, ③ Number Value ④ Corner location of •

Therefore, a perfect matching would be as shown in the connections, such that no matching of cards shares any properties.

We can write this as $C \subseteq \{a_1 \dots a_v\}^4$ where 4 is the number of properties.

Therefore, if k-Property Set is satisfied (a perfect match is found) a perfect set is also found for the cards in Set.