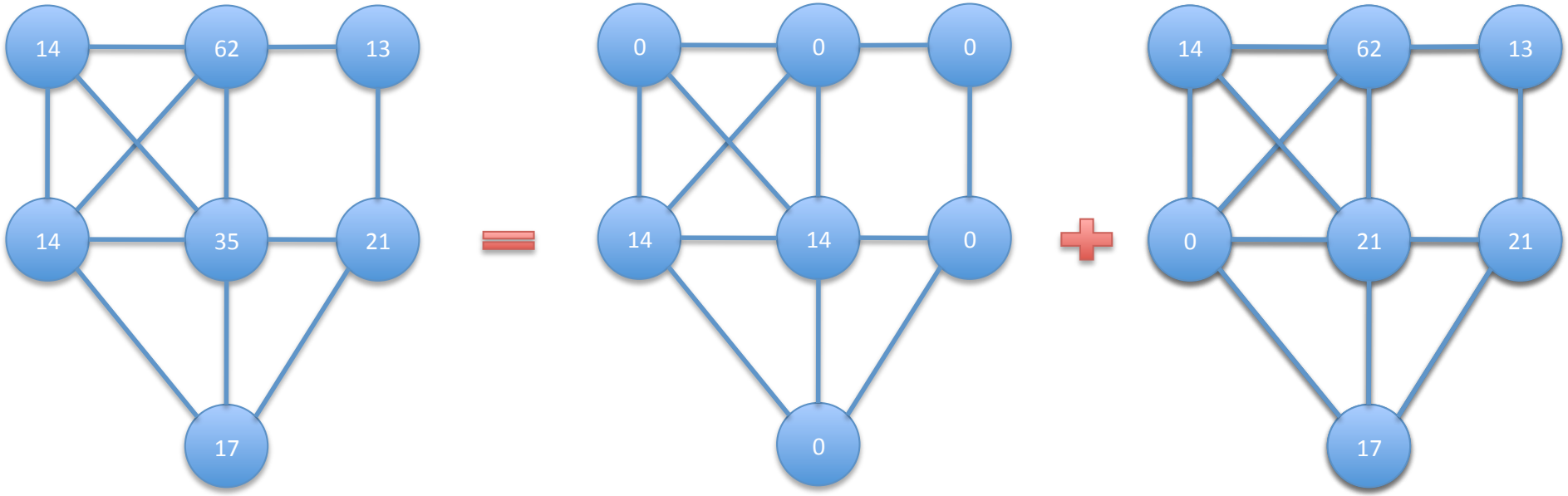
Local Ratio Demos

Ola Svensson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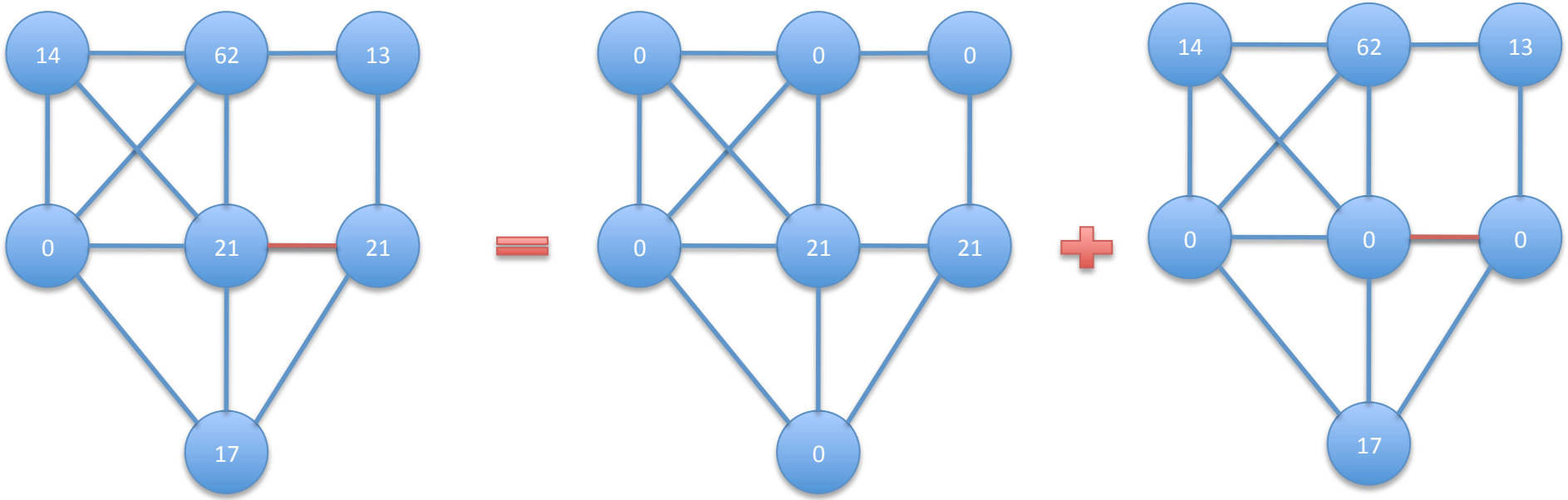
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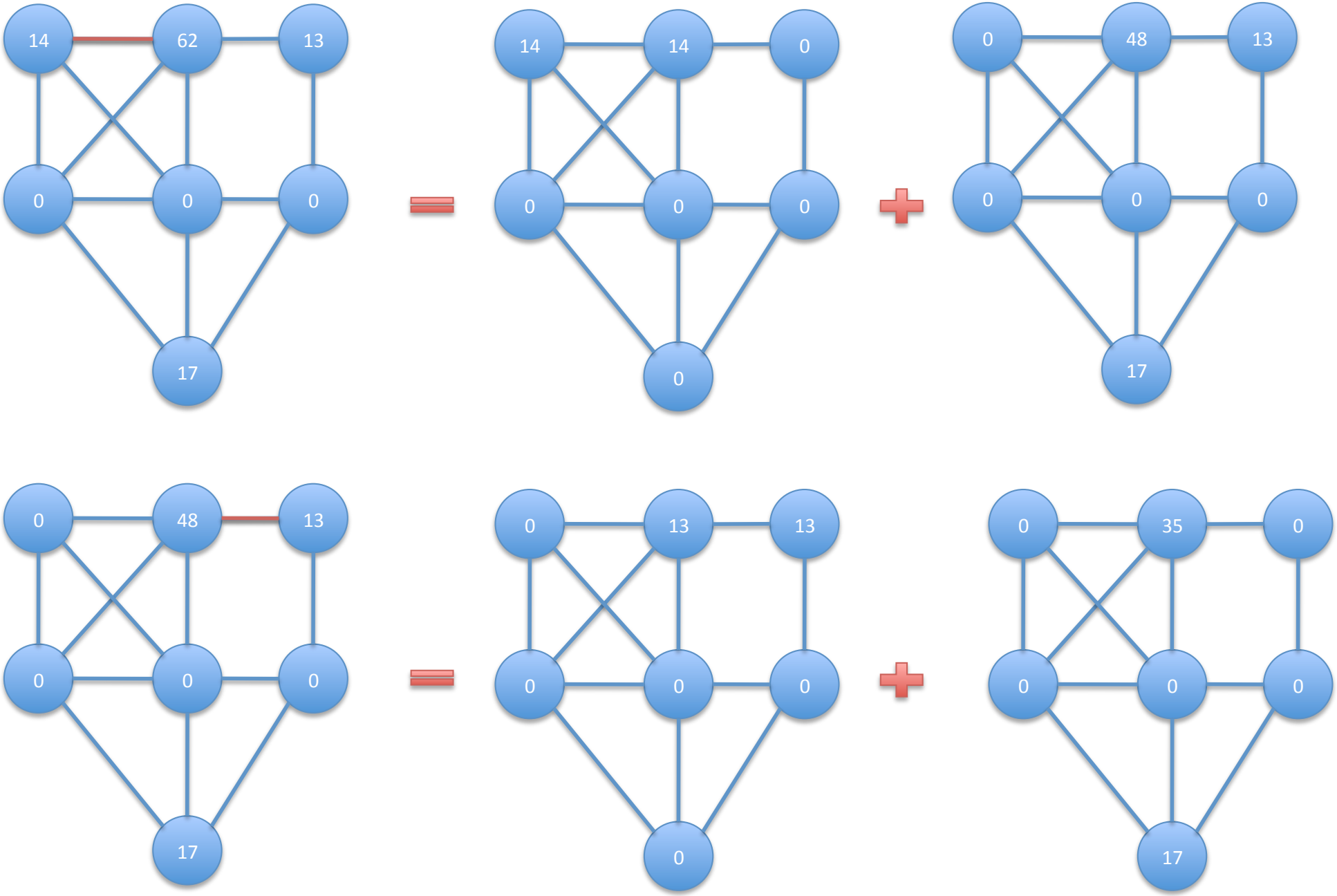
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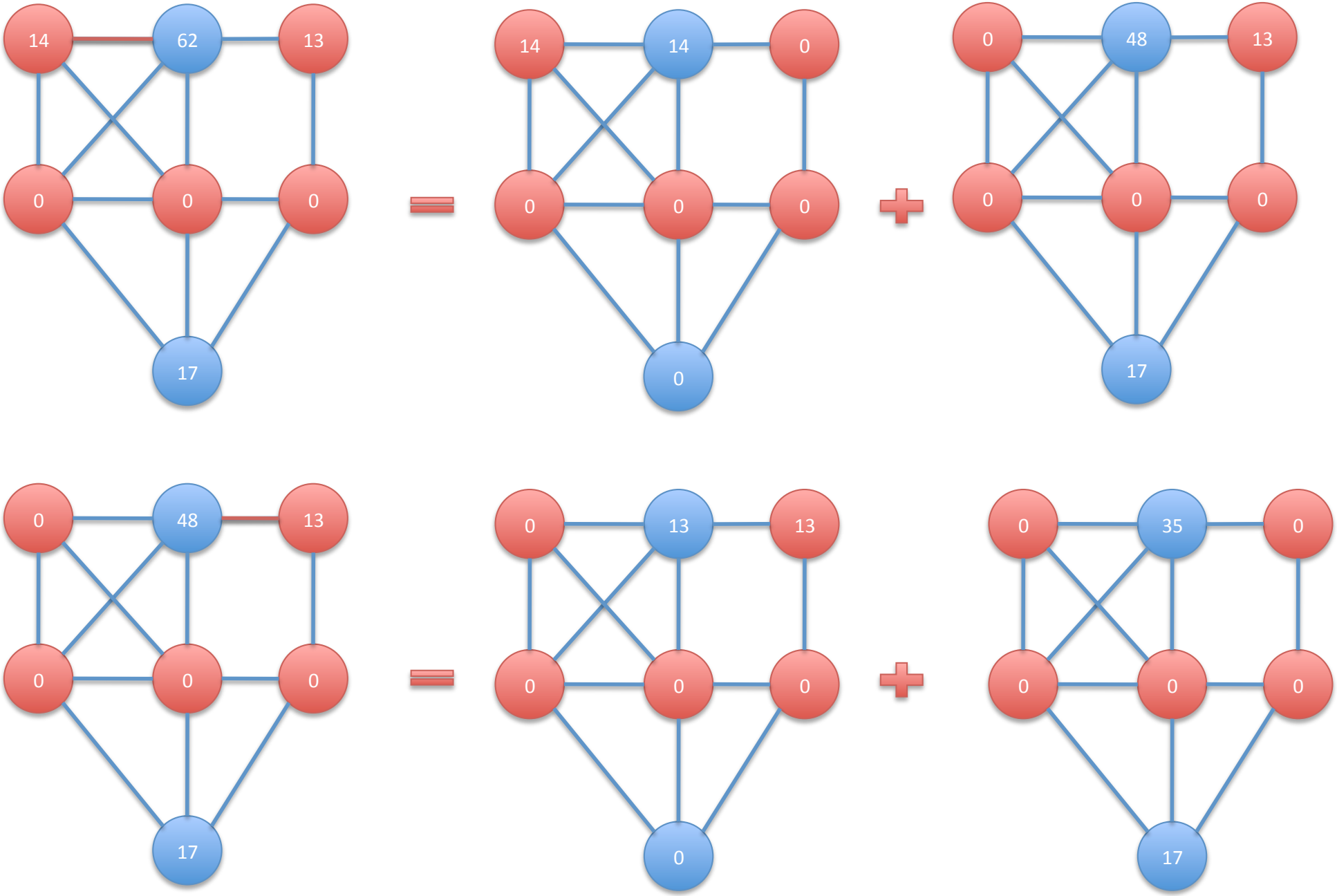
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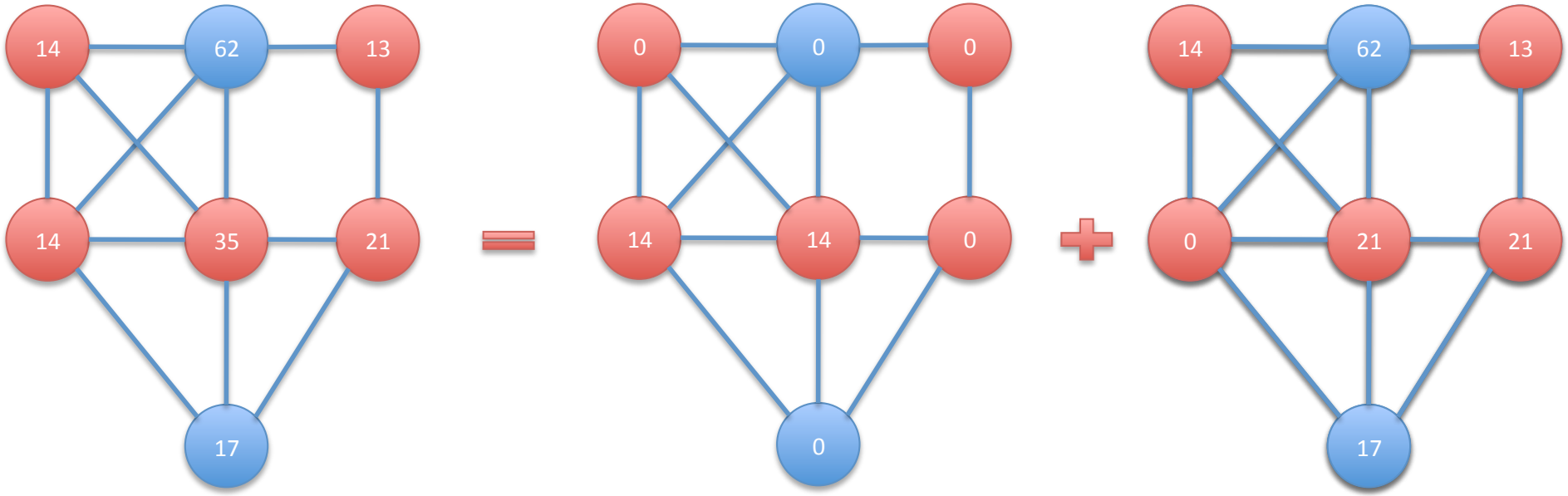
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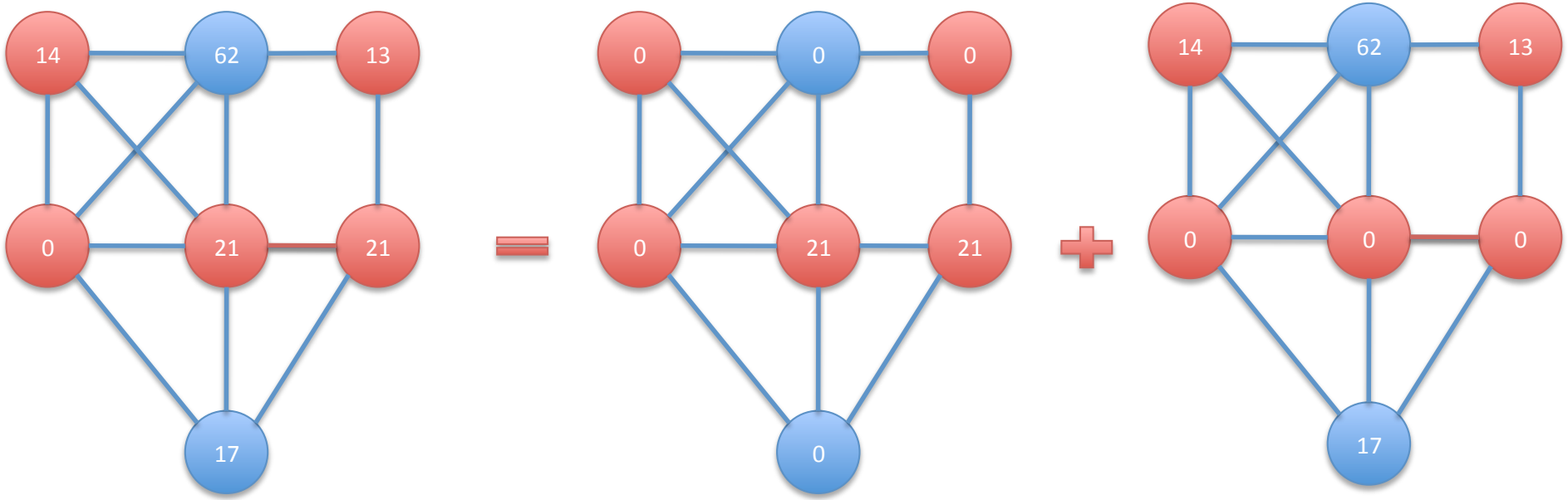
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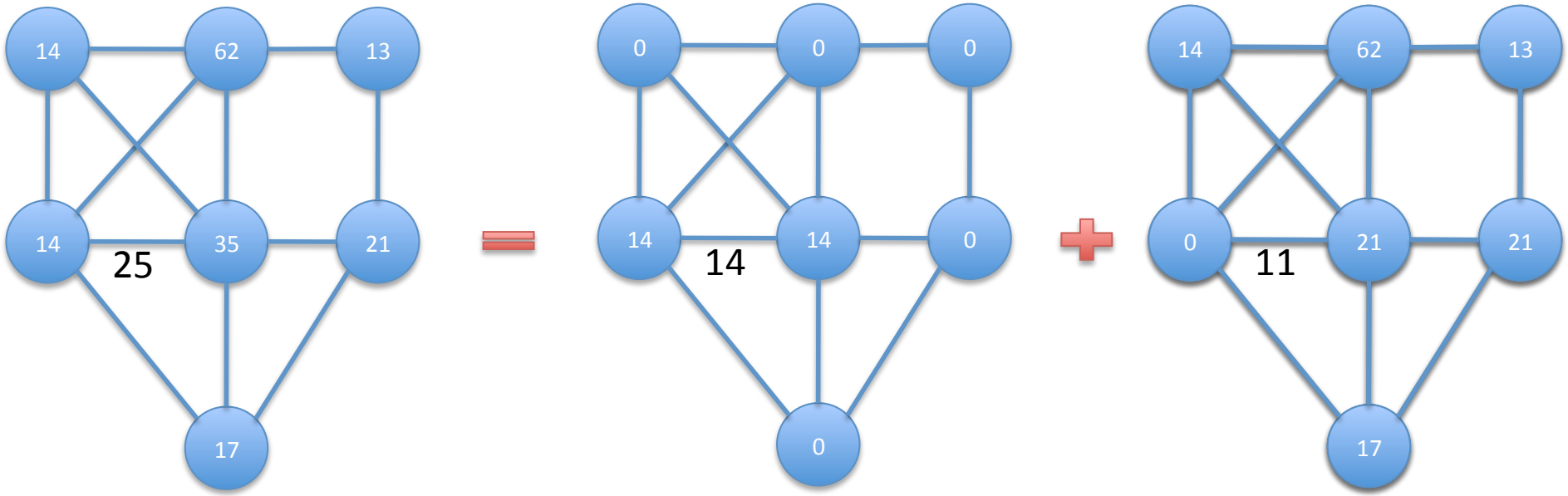
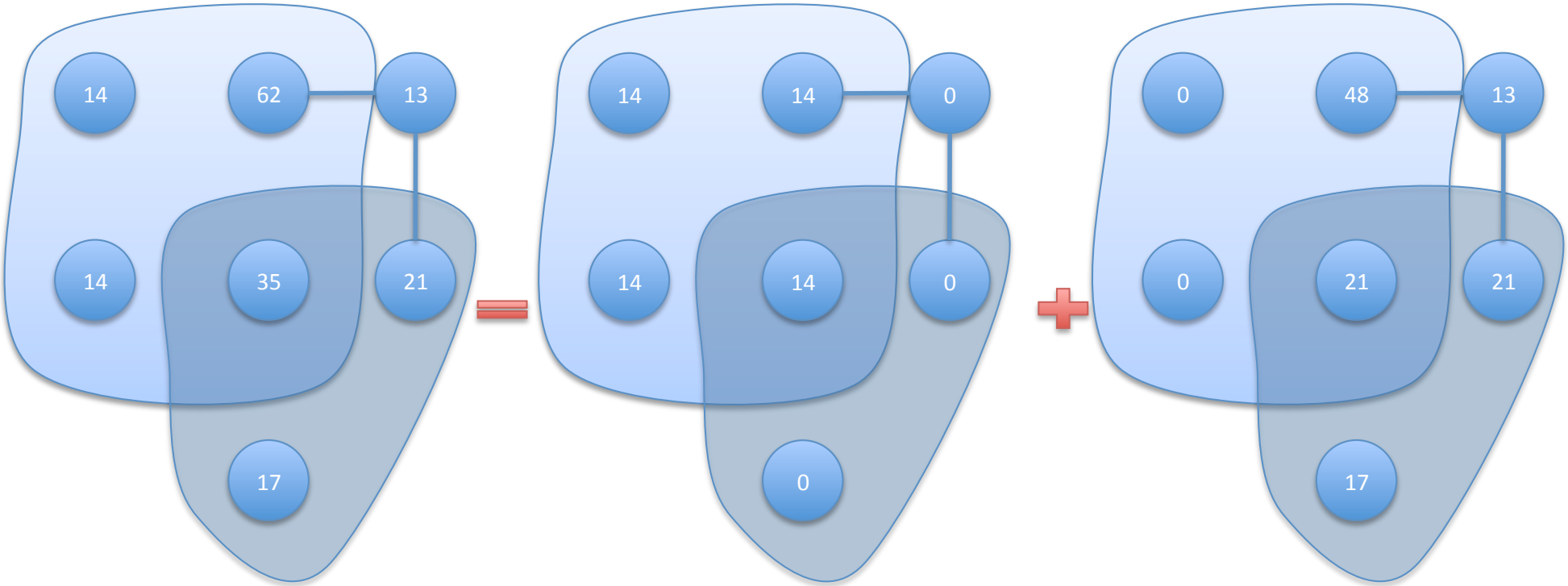
Prize collecting Vertex Cover



Hitting Set



Slide from http://www.cs.technion.ac.il/~reuven/APPROX-SEMINAR/spr06/LR.ppt

- Applications to some optimization algorithms (r = 1):
- (MST) Minimum Spanning Tree (Kruskal)
- (SHORTEST-PATH) s-t Shortest Path (Dijkstra)
- (LONGEST-PATH) s-t DAG Longest Path (Can be done with dynamic programming)
- (INTERVAL-IS) Independents-Set in Interval Graphs Usually done with dynamic programming)
- (LONG-SEQ) Longest (weighted) monotone subsequence (Can be done with dynamic programming)
- (MIN_CUT) Minimum Capacity s,t Cut (e.g. Ford, Dinitz)
- Applications to some 2-Approximation algorithms: (r = 2)
- (VC) Minimum Vertex Cover (Bar-Yehuda and Even)
- (FVS) Vertex Feedback Set (Becker and Geiger)
- (GSF) Generalized Steiner Forest (Williamson, Goemans, Mihail, and Vazirani)
- (Min 2SAT) Minimum Two-Satisfibility (Gusfield and Pitt)
- (2VIP) Two Variable Integer Programming (Bar-Yehuda and Rawitz)
- (PVC) Partial Vertex Cover (Bar-Yehuda)
- (GVC) Generalized Vertex Cover (Bar-Yehuda and Rawitz)
- Applications to some other Approximations:
- (SC) Minimum Set Cover (Bar-Yehuda and Even)
- (PSC) Partial Set Cover (Bar-Yehuda)
- (MSP) Maximum Set Packing (Arkin and Hasin)
- Applications Resource Allocation and Scheduling :

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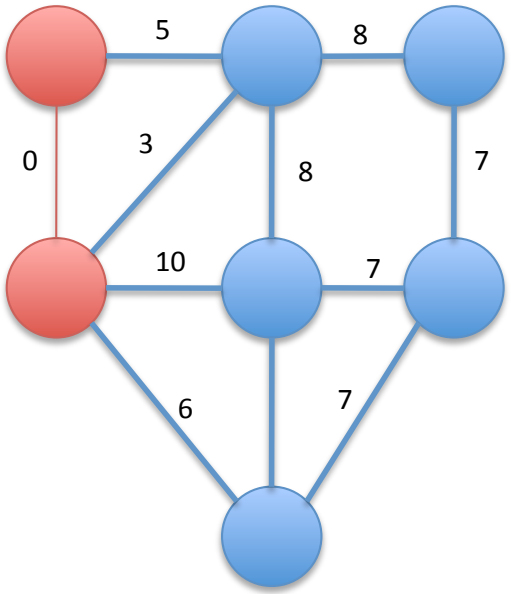
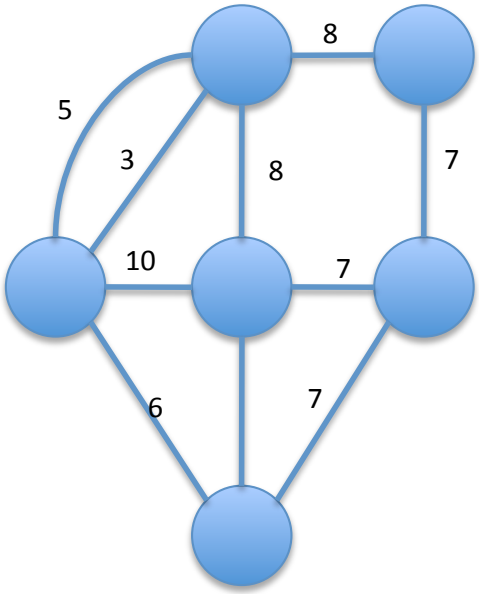
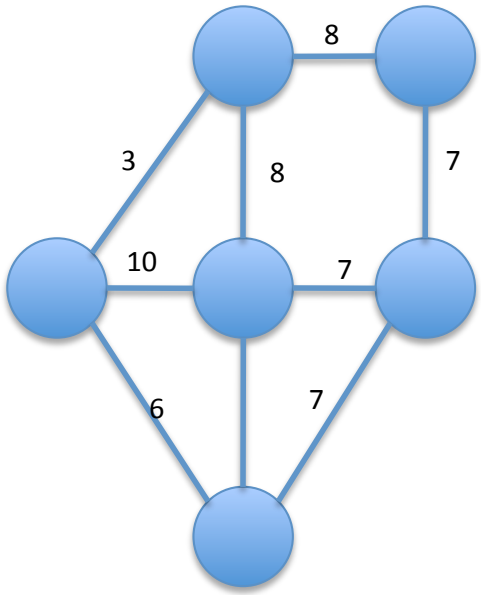
Spanning Tree

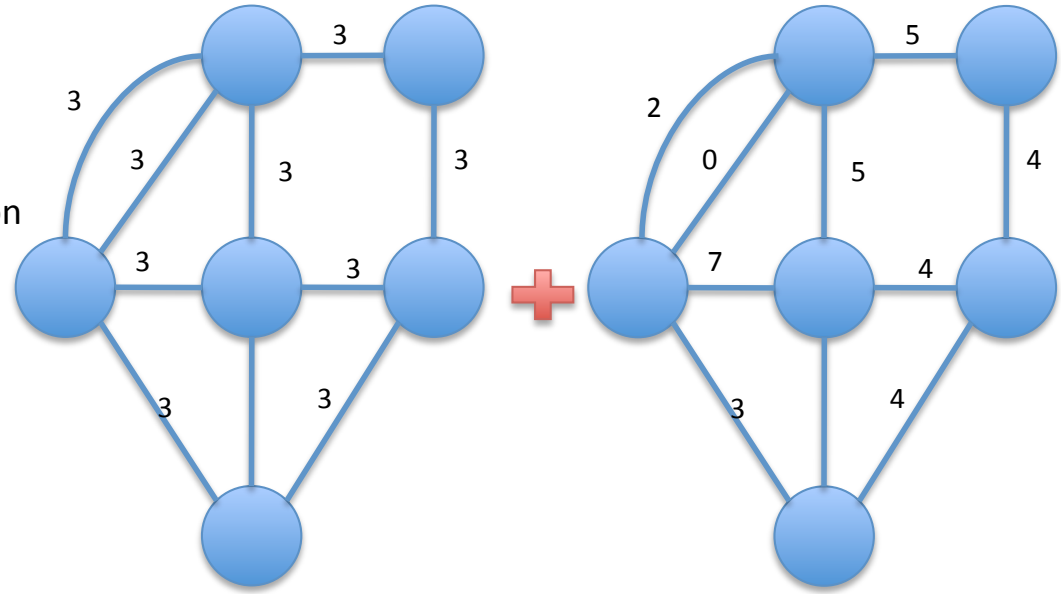


Problem Reduction

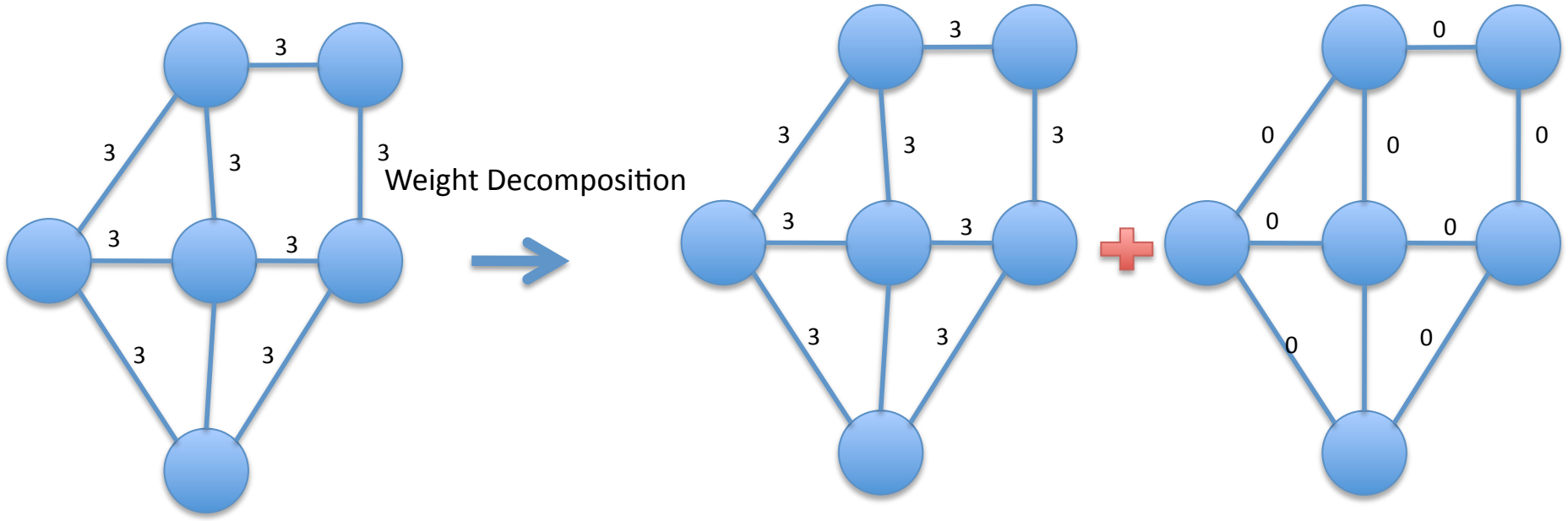




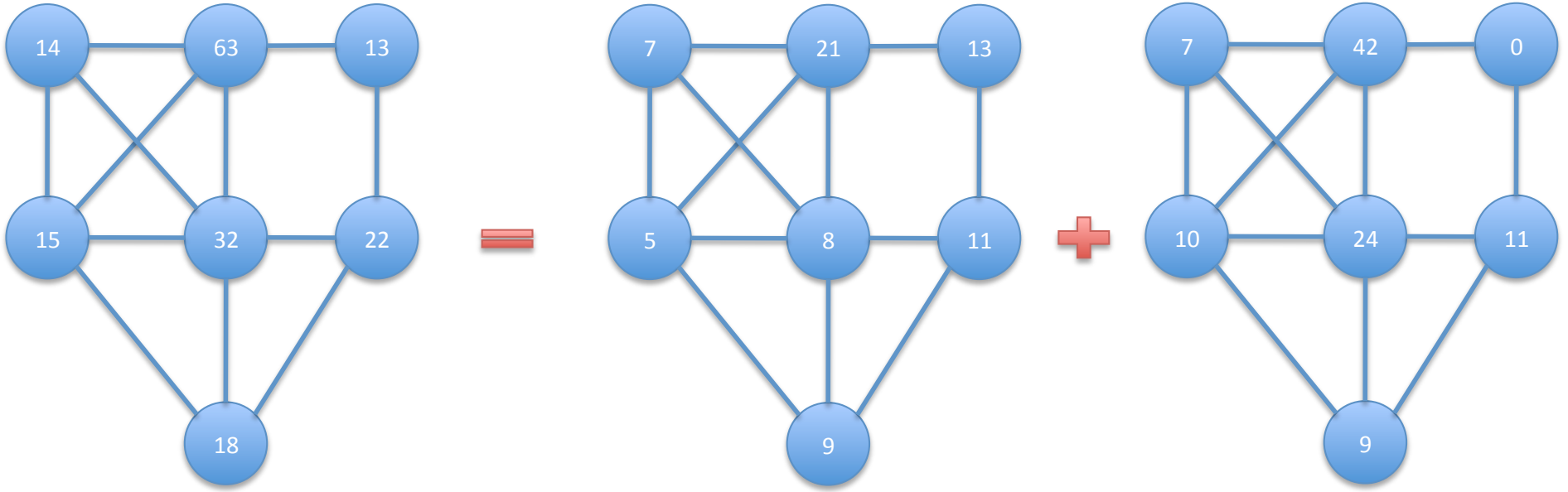
Weight Decomposition



Minimum Connected Subgraph



Not fully 1-effective !!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