Andrew
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Homework 5 CS 6840

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a) V_6, V_8, V_9, V_{11}

b) V_6, V_8, V_9, V_{11}

c) $V_6, V_7, V_8, V_9, V_{11}$

d) V_6, V_7, V_8

e) $V_{11}, V_{12}, V_{13}, V_{14}$

f) V_6, V_7, V_8, V_9

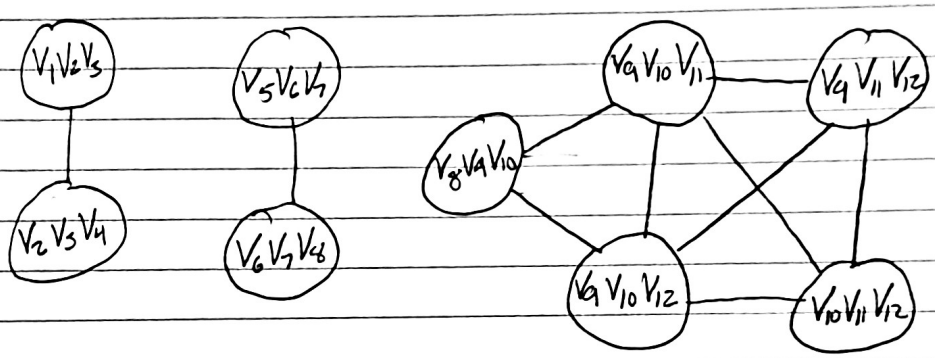
g) $\{V_1, V_2, \ldots, V_{15}\}$ all nodes are in 1-core for this graph

h) $V_6, V_7, V_8, V_9, V_{10}, V_{11}, V_{12}, V_{13}, V_{14}$

i) $V_7, V_{10}, V_{13}, V_{14}, V_{12}$

j) V_6, V_8, V_9, V_{11}

2] 3-Cliques $V_1 V_2 V_3$ $V_2 V_3 V_4$
$V_5 V_6 V_7$ $V_6 V_7 V_8$
$V_8 V_9 V_{10}$ $V_9 V_{10} V_{11}$
$V_9 V_{10} V_{12}$ $V_9 V_{11} V_{12}$
$V_{10} V_{11} V_{12}$



Communities: $\{V_1, V_2 V_3, V_4\}$
$\{V_5, V_6, V_7, V_8\}$
$\{V_8, V_9, V_{10}, V_{11}, V_{12}\}$

Algorithm/Measure	Purity	NMI	Precision	Recall	F1-score
Spectral Clustering (ratio cut)	0.794	0.411	1	0.708	0.741
Spectral Clustering (normalized ratio cut)	0.559	0.732	1	0.895	0.938
Modularity Maximization	0.529	0.837	1	0.944	0.970
Girvan-Newman	0.559	0.732	1	0.895	0.938
Node similarity (Jaccard)	0.412	0.427	0.765	0.929	0.865
Node similarity (Cosine)	0.471	0.268	0.765	0.823	0.800