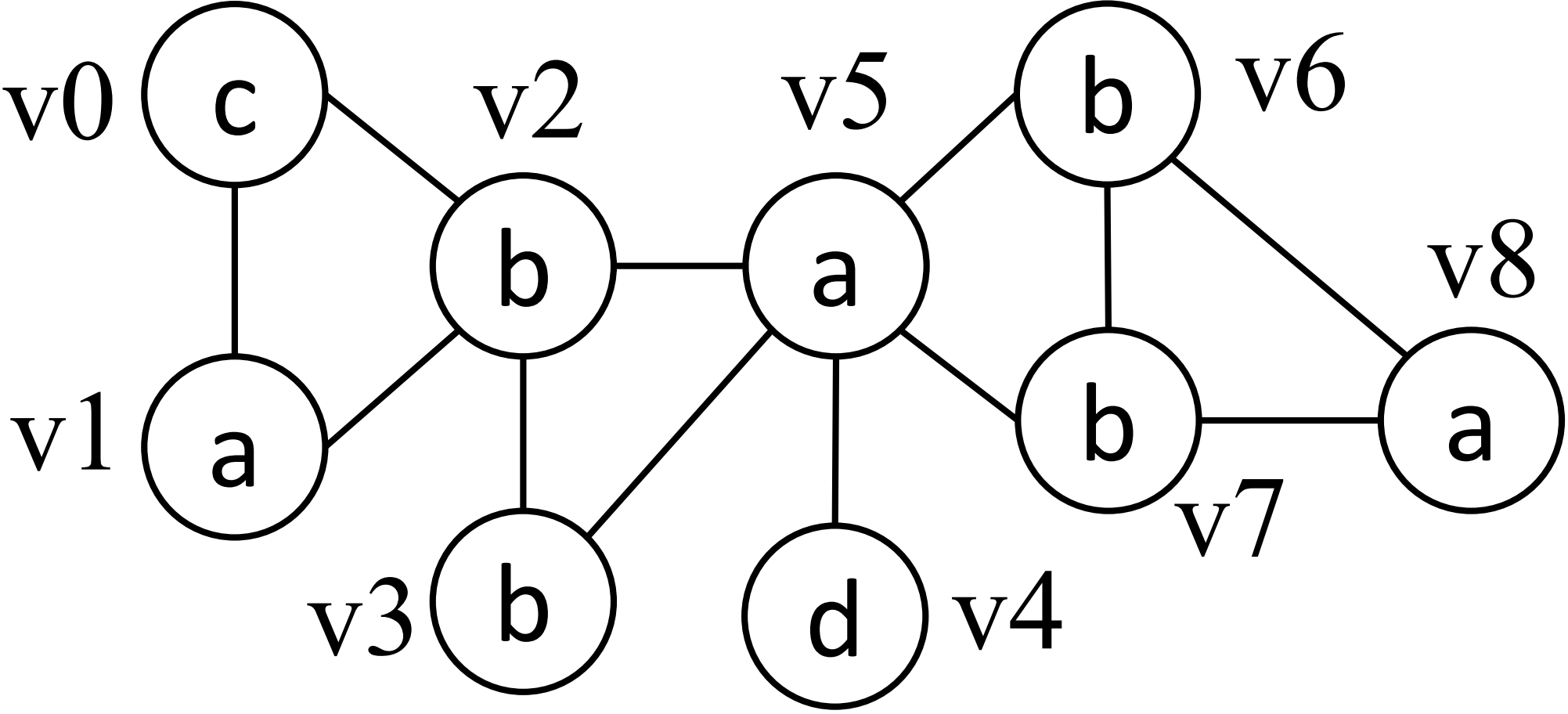
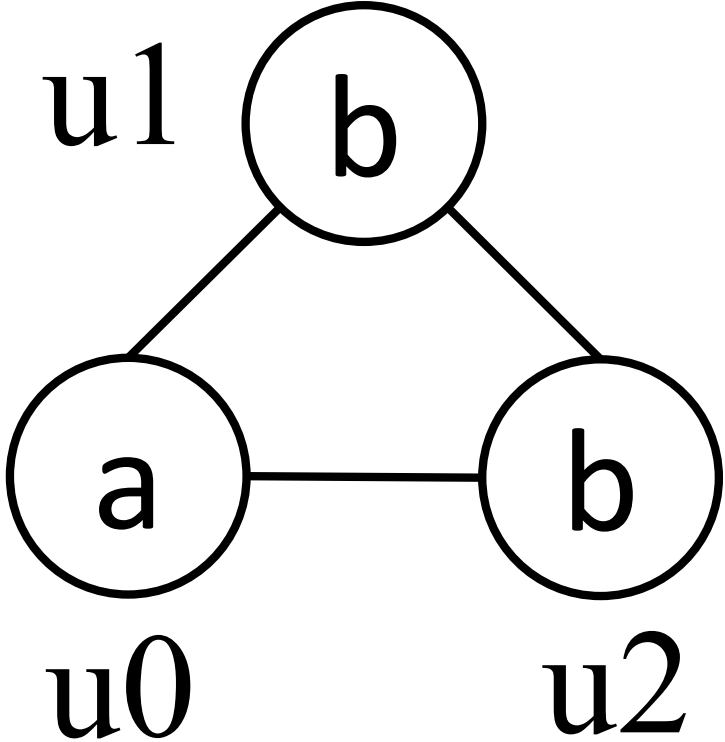
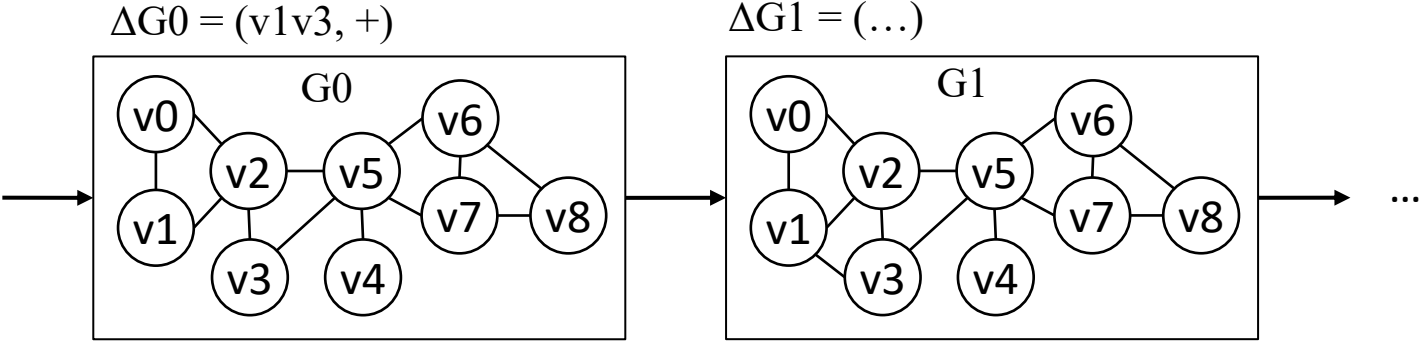
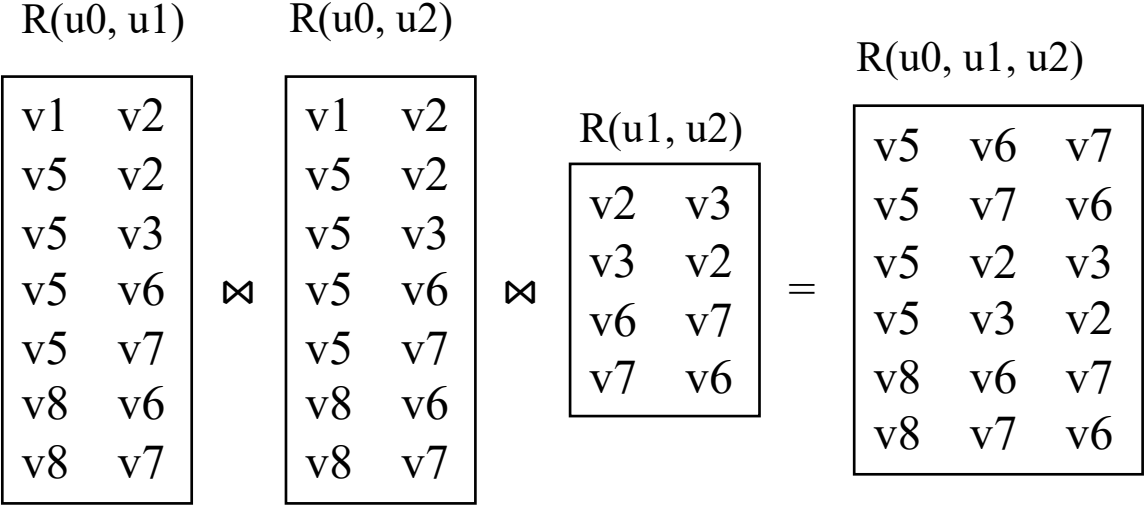

v0
c
v2
v5
b
v6
b
v8
a
v1
a
b
b
a
v7
v3
b
d
v4

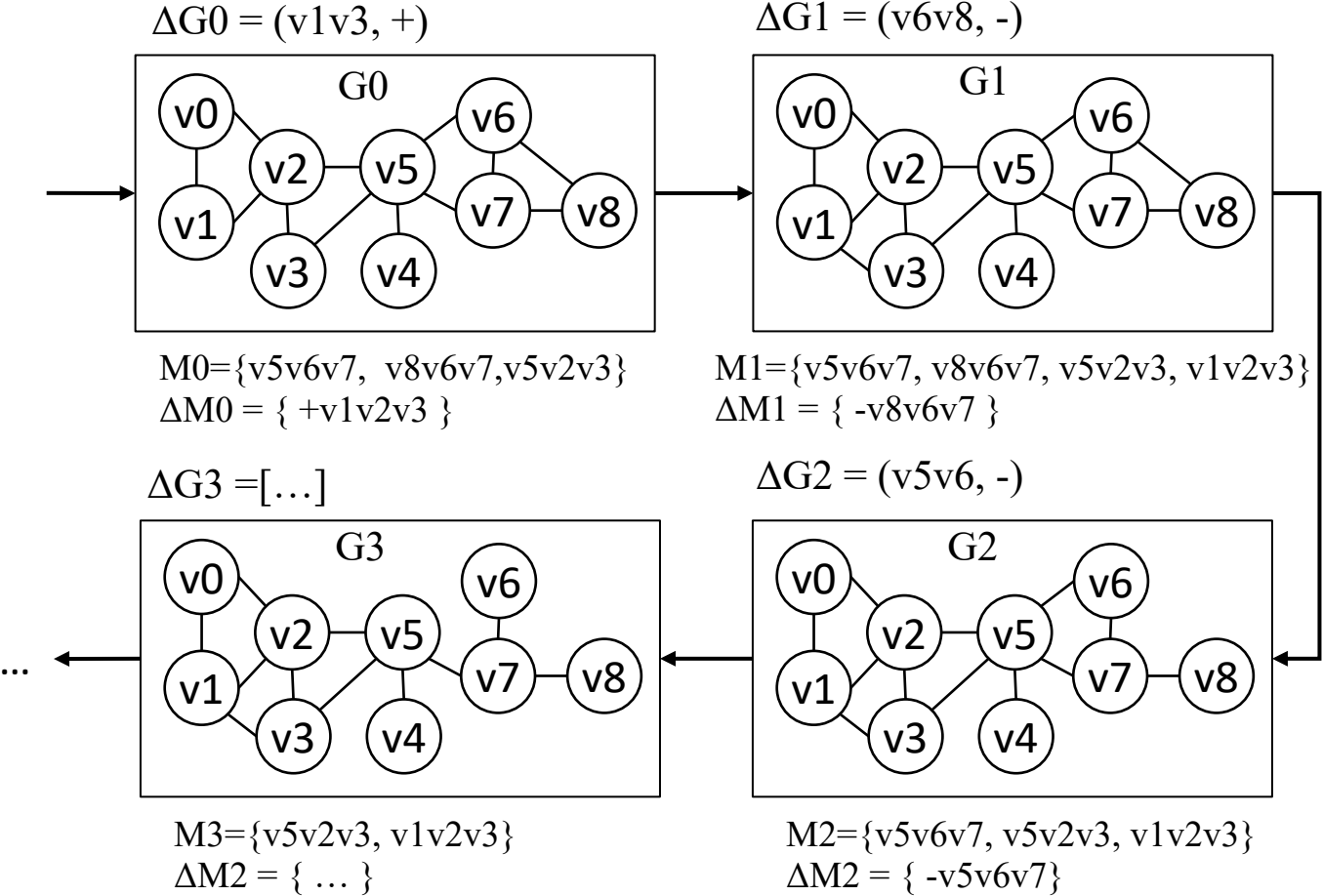

u1
b
a
b
u0
u2



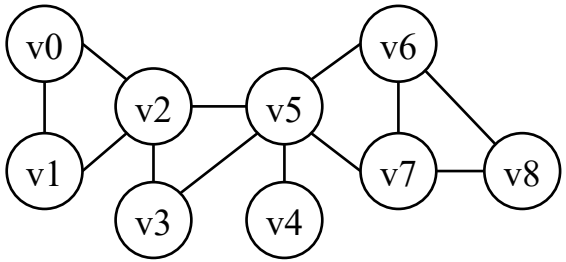
M0={v5v6v7, v8v6v7,v5v2v3}
ΔM0 = { +v1v2v3 }

M1={v5v6v7, v8v6v7, v5v2v3, v1v2v3}
ΔM1 = {…}


R(u0, u1)
v1 v2
v5 v2
v5 v3
v5 v6
v5 v7
v8 v6
v8 v7
⋈
R(u0, u2)
v1 v2
v5 v2
v5 v3
v5 v6
v5 v7
v8 v6
v8 v7
⋈
R(u1, u2)
v2 v3
v3 v2
v6 v7
v7 v6
=
R(u0, u1, u2)
v5 v6 v7
v5 v7 v6
v5 v2 v3
v5 v3 v2
v8 v6 v7
v8 v7 v6

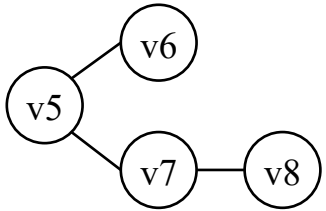

ΔG0 = (v1v3, +)
G0
v0
v1
v2
v3
v4
v5
v6
v7
v8
ΔG1 = (v6v8, -)
G1
M0={v5v6v7, v8v6v7,v5v2v3}
ΔM0 = { +v1v2v3 }
M1={v5v6v7, v8v6v7, v5v2v3, v1v2v3}
ΔM1 = { -v8v6v7 }
ΔG3 =[…]
G3
ΔG2 = (v5v6, -)
G2
...
M3={v5v2v3, v1v2v3}
ΔM2 = { … }
M2={v5v6v7, v5v2v3, v1v2v3}
ΔM2 = { -v5v6v7}

Data Graph G



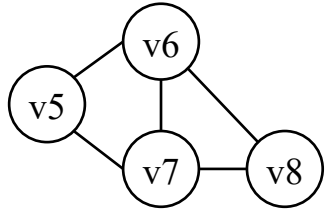
(1)

An edge-induced subgraph of G



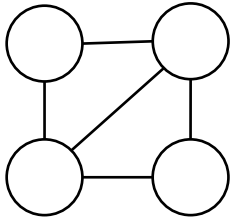
(2)

A vertex-induced subgraph of G



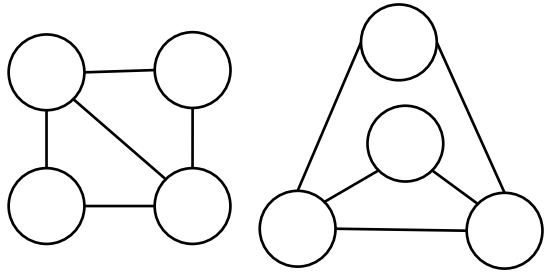
(3)

Query Graph Q



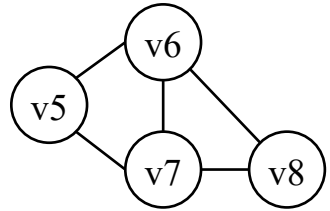
(4)

Two isomorphisms of Q

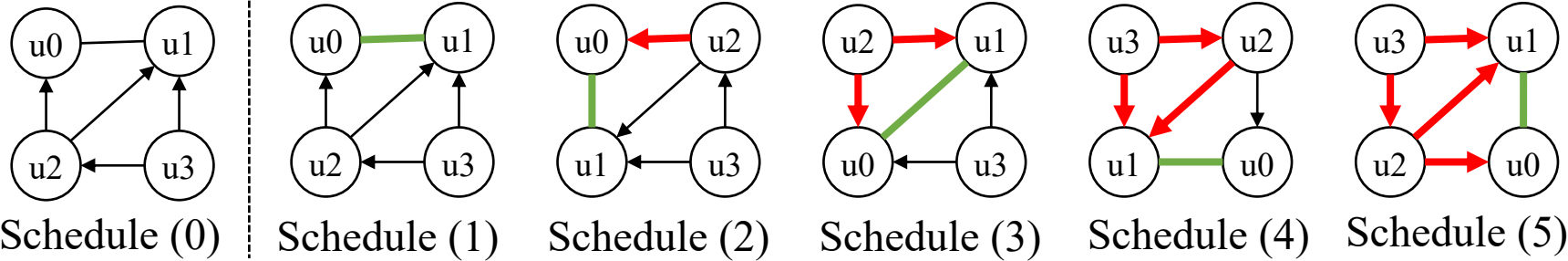


(5)

Subgraph in G that is isomorphic to Q



(6)


u0
u1
u2
u3
Schedule (0)
u0
u1
u2
u3
Schedule (1)
u0
u2
u1
u3
Schedule (2)
u2
u1
u0
u3
Schedule (3)
u3
u2
u1
u0
Schedule (4)
u3
u1
u2
u0
Schedule (5)

(0)

```
atching Order: {u0, u1, u2, u3}
r( v0, v1 ∈ All Edges in Graph){
 for( v2 ∈ N(v0) ∩ N(v1) ){
    for( v3 ∈ N(v1) ∩ N(v2) ) {
       output (v0, v1, v2, v3) }}}
```

(1)

$\Delta R1 \bowtie R2 \bowtie R3 \bowtie R4 \bowtie R5$

Matching Order: {u0, u1, u2, u3}

```
for( v0, v1 ∈ New Edge Set ){
   for( v2 ∈ N(v0) ∩ N(v1) ){
      for( v3 ∈ N(v1) ∩ N(v2) ) {
         output (v0, v1, v2, v3) }}}
```

(2)

Matching Order: {u0, u2, u1, u3}

```
for( v0, v1 ∈ New Edge Set ){
   for( v2 ∈ NN(v0) ∩ N(v1) ){
      for( v3 ∈ N(v1) ∩ N(v2) ) {
         output (v0, v1, v2, v3) }}}
```

(3)

Matching Order: {u2, u1, u0, u3}

```
for( v0, v1 ∈ New Edge Set ){
   for( v2 ∈ NN(v0) ∩ NN(v1) ){
      for( v3 ∈ N(v0) ∩ N(v1) ) {
         output (v0, v1, v2, v3) }}}
```

(4)

Matching Order: {u3, u2, u1, u0}

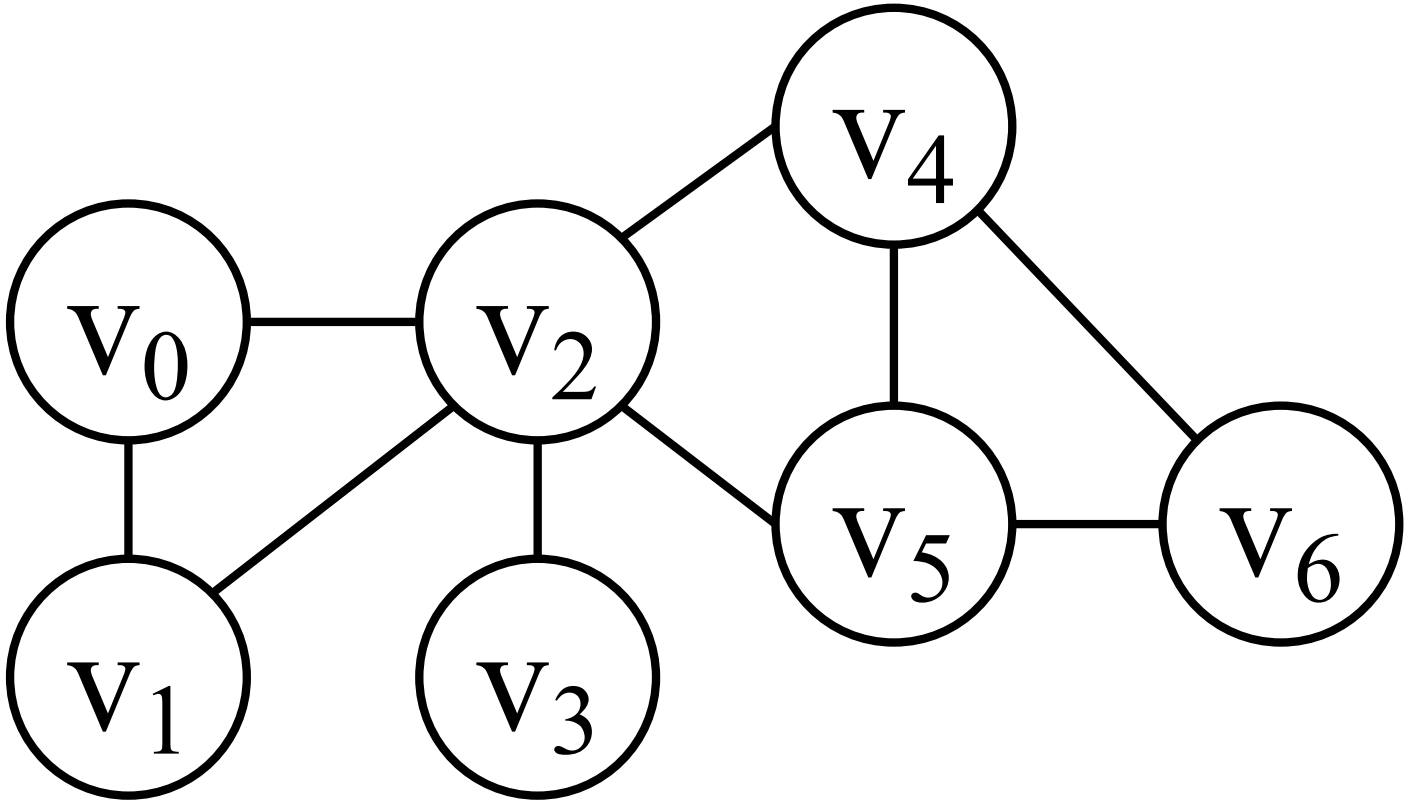
```
for( v0, v1 ∈ New Edge Set ){
   for( v2 ∈ N(v0) ∩ NN(v1) ){
      for( v3 ∈ NN(v1) ∩ NN(v2) ) {
         output (v0, v1, v2, v3) }}}
```

(5)

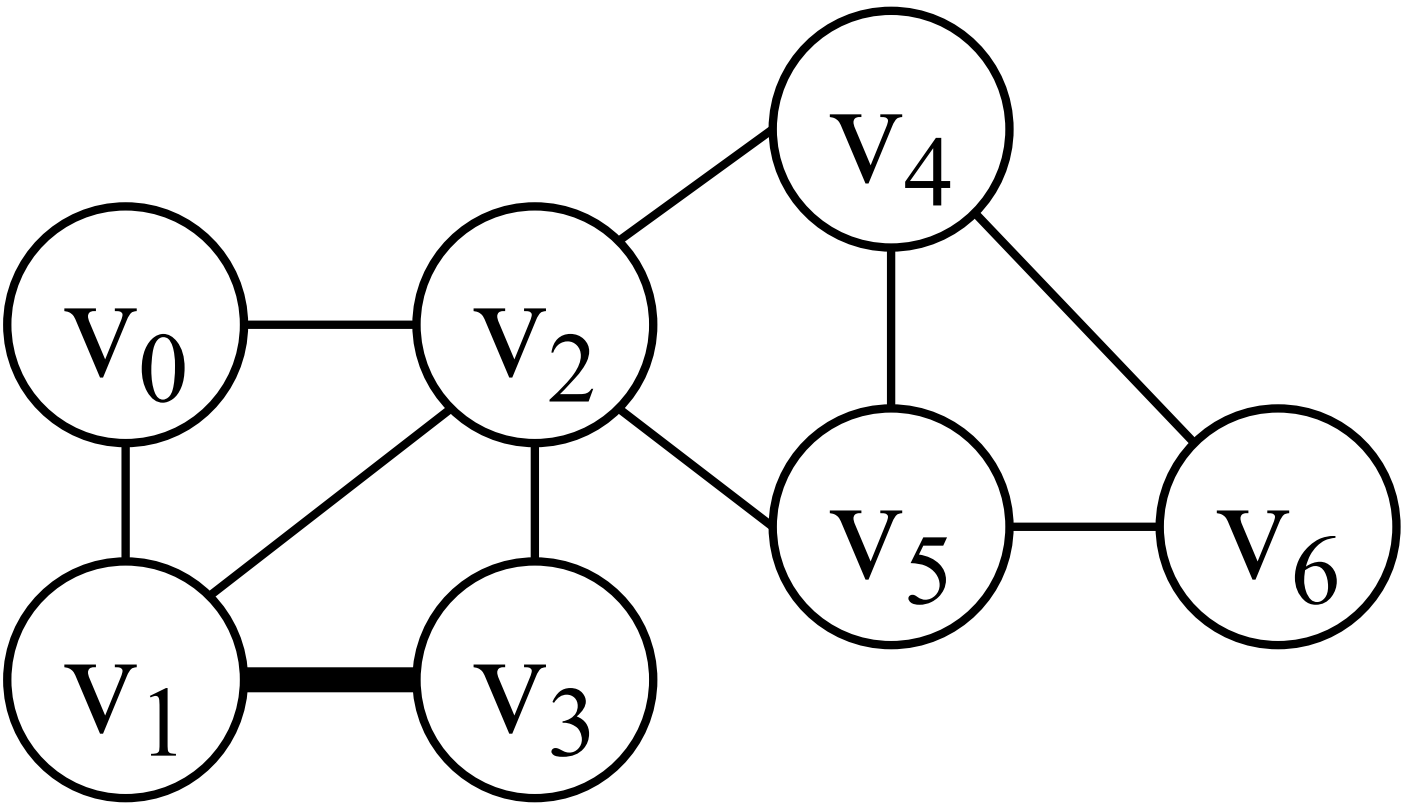
Matching Order: {u3, u1, u2, u0}

```
for( v0, v1 ∈ New Edge Set ){
   for( v2 ∈ NN(v0) ∩ NN(v1) ){
      for( v3 ∈ NN(v1) ∩ NN(v2) ) {
         output (v0, v1, v2, v3) }}}
```

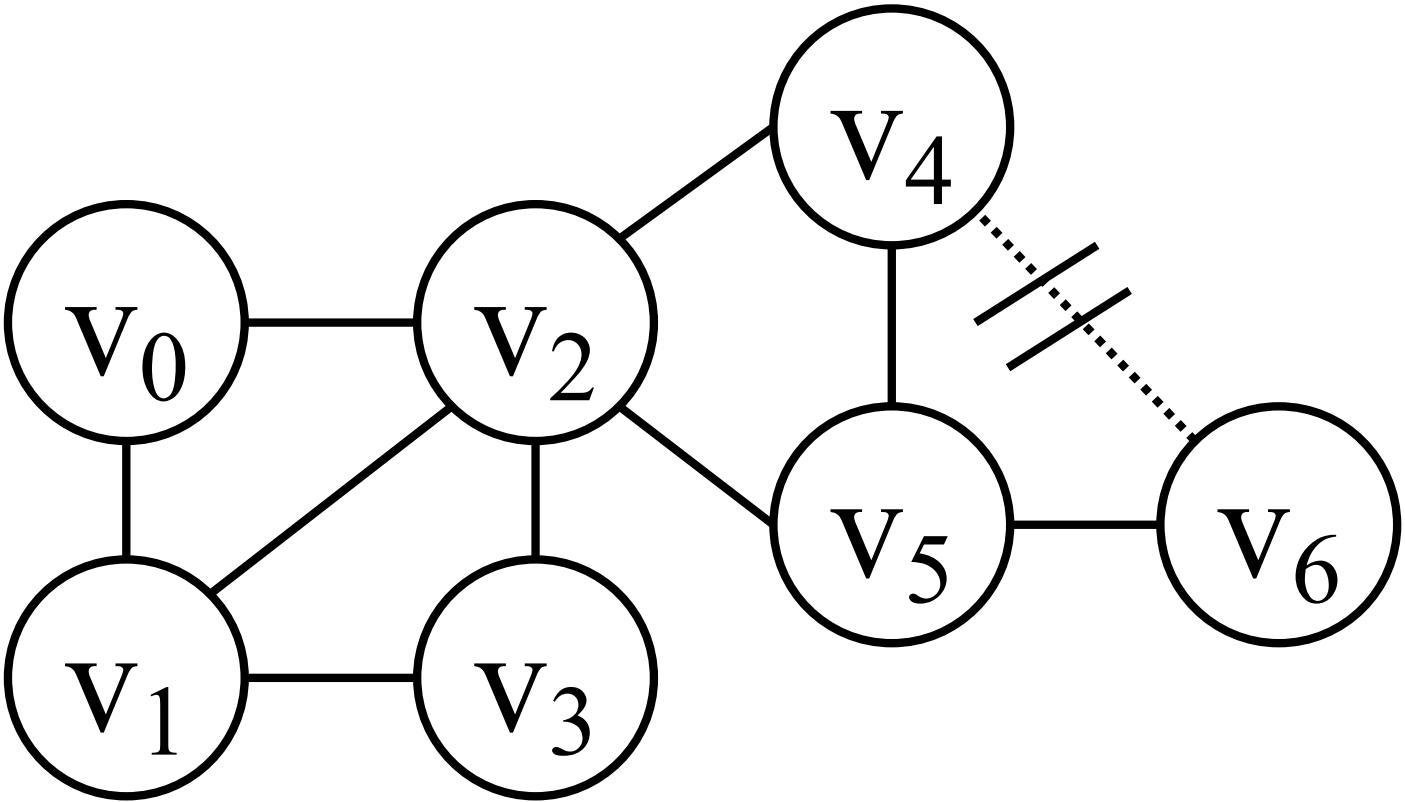
Initial: $\{v_2, v_4, v_5, v_6\}$

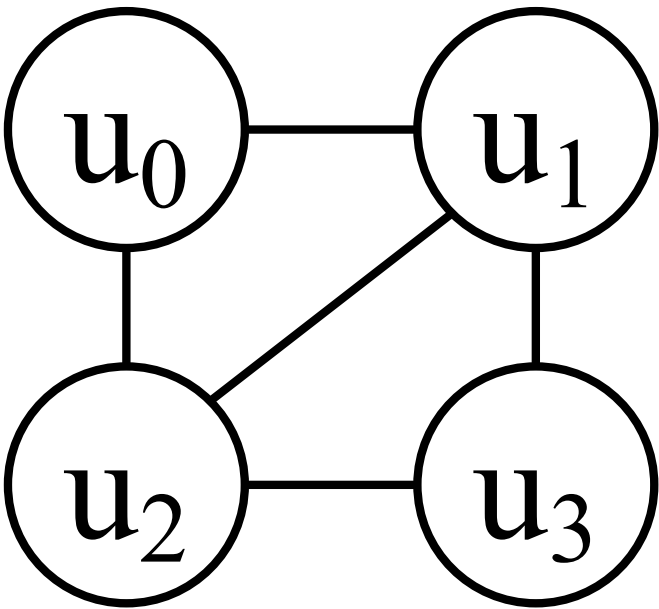


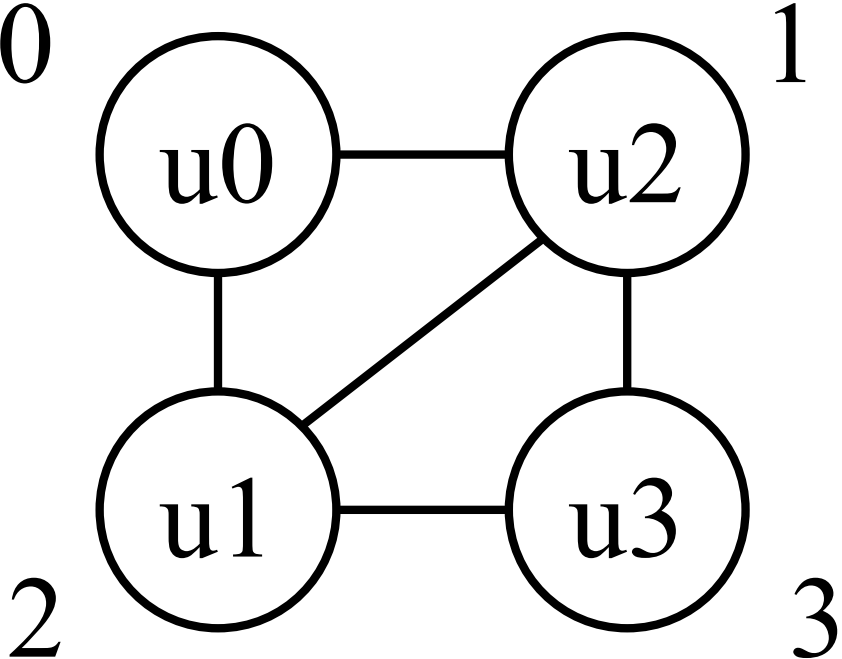
+ $\{v_0, v_1, v_2, v_3\}$



- $\{v_2, v_4, v_5, v_6\}$




u_0
u_1
u_2
u_3


0
1
u0
u2
u1
u3
2
3