

# Homework 4

Gus Lipkin

This graph database represents the people I talk to on a daily basis. Some are coworkers, friends, family, or fill multiple roles.

## Code

```
1 CREATE (me:Person { name: "Gus",
2                       from: "Boston",
3                       worksAt: "SGA, SDC",
4                       schoolAt: "Florida Poly"})
5
6 CREATE (hs:Person { name: "Hail",
7                     from: "Spring Hill",
8                     worksAt: "SGA",
9                     schoolAt: "Florida Poly" }),
10      (gl)-[:KNOWS]->(hs), (gl)-[:WORKSWITH]->(hs), (gl)-[:SCHOOLWITH]-
11      >(hs),
12      (aa:Person { name: "Austin",
13                  from: "San Francisco",
14                  schoolAt: "Florida Poly" }),
15      (gl)-[:KNOWS]->(aa), (gl)-[:SCHOOLWITH]->(aa),
16      (hs)-[:KNOWS]->(aa), (hs)-[:SCHOOLWITH]->(aa),
17      (jg:Person { name: "Jake",
18                  from: "Miami",
19                  worksAt: "SGA, Draken",
20                  schoolAt: "Florida Poly" }),
21      (gl)-[:KNOWS]->(jg), (gl)-[:WORKSWITH]->(jg), (gl)-
22      [:SCHOOLWITH]->(jg),
23      (imz:Person { name: "Izzy",
24                   from: "Boca Raton",
25                   worksAt: "Draken",
26                   schoolAt: "Florida Poly" }),
27      (gl)-[:KNOWS]->(imz), (gl)-[:SCHOOLWITH]->(imz), (gl)-
28      [:ROOMIESWITH]->(imz),
29      (aa)-[:KNOWS]->(imz), (aa)-[:SCHOOLWITH]->(imz),
30      (hs)-[:KNOWS]->(imz), (hs)-[:SCHOOLWITH]->(imz),
31      (jg)-[:KNOWS]->(imz), (jg)-[:WORKSWITH]->(imz), (jg)-
32      [:SCHOOLWITH]->(imz),
33      (ts:Person { name: "Tucker",
34                  from: "Jupiter",
35                  worksAt: "M&M Systems",
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32         schoolAt: "Florida Poly" })),
33         (gl)-[:KNOWS]->(ts), (gl)-[:SCHOOLWITH]->(ts),
34         (hs)-[:KNOWS]->(ts),
35         (imz)-[:KNOWS]->(ts),
36         (lm:Person { name: "Lukas",
37                     from: "Jupiter",
38                     worksAt: "M&M Systems",
39                     schoolAt: "Florida Poly" })),
40         (gl)-[:KNOWS]->(ts), (gl)-[:SCHOOLWITH]->(ts),
41         (hs)-[:KNOWS]->(ts),
42         (ts)-[:KNOWS]->(lm), (ts)-[:WORKSWITH]->(lm), (ts)-
[:SCHOOLWITH]->(lm),
43         (ml:Person { name: "Macy",
44                     from: "Boston",
45                     worksAt: "NENC",
46                     schoolAt: "Wellesley" })),
47         (gl)-[:KNOWS]->(ml), (gl)-[:RELATEDTO]->(ml),
48         (imz)-[:KNOWS]->(ml),
49         (m:Person { name: "Mom",
50                     from: "Commack",
51                     worksAt: "Mass DPH",
52                     schoolAt: "Oberlin" })),
53         (gl)-[:KNOWS]->(m), (gl)-[:RELATEDTO]->(m),
54         (ml)-[:KNOWS]->(m), (ml)-[:RELATEDTO]->(m),
55         (eh:Person { name: "Esther",
56                     from: "Long Island" })),
57         (gl)-[:KNOWS]->(eh),
58         (ml)-[:KNOWS]->(eh),
59         (m)-[:KNOWS]->(eh),
60         (iz:Person { name: "Isabel",
61                     from: "Peoria",
62                     worksAt: "RStudio",
63                     schoolAt: "Florida Poly" })),
64         (gl)-[:KNOWS]->(imz), (gl)-[:SCHOOLWITH]->(iz),
65         (aa)-[:KNOWS]->(imz), (aa)-[:SCHOOLWITH]->(iz),
66         (hs)-[:KNOWS]->(imz), (hs)-[:SCHOOLWITH]->(iz),
67         (jg)-[:KNOWS]->(imz), (jg)-[:SCHOOLWITH]->(imz),
68         (imz)-[:KNOWS]->(iz), (imz)-[:SCHOOLWITH]->(iz),
69         (ch:Person { name: "Chris",
70                     from: "Boston",
71                     worksAt: "MSA",
72                     schoolAt: "Bates" })),
73         (gl)-[:KNOWS]->(ch),
74         (ml)-[:KNOWS]->(ch),
75         (m)-[:KNOWS]->(ch),
76         (imz)-[:KNOWS]->(ch),

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77      (ah:Person { name: "Antonio",
78                  from: "Tampa",
79                  worksAt: "SGA",
80                  schoolAt: "Florida Poly" }),
81      (gl)-[:KNOWS]->(ah), (gl)-[:SCHOOLWITH]->(ah), (gl)-
[:WORKSWITH]->(ah),
82      (aa)-[:SCHOOLWITH]->(ah),
83      (hs)-[:KNOWS]->(ah), (hs)-[:SCHOOLWITH]->(ah), (hs)-
[:WORKSWITH]->(ah),
84      (jg)-[:KNOWS]->(ah), (jg)-[:SCHOOLWITH]->(ah), (jg)-
[:WORKSWITH]->(ah),
85      (imz)-[:SCHOOLWITH]->(ah),
86      (iz)-[:SCHOOLWITH]->(ah),
87      (mr:Person { name: "Melia",
88                  from: "Boca Raton",
89                  worksAt: "SGA",
90                  schoolAt: "Florida Poly" }),
91      (gl)-[:KNOWS]->(mr), (gl)-[:SCHOOLWITH]->(mr), (gl)-
[:WORKSWITH]->(mr),
92      (aa)-[:SCHOOLWITH]->(mr),
93      (hs)-[:KNOWS]->(mr), (hs)-[:SCHOOLWITH]->(mr), (hs)-
[:WORKSWITH]->(mr),
94      (jg)-[:KNOWS]->(mr), (jg)-[:SCHOOLWITH]->(mr), (jg)-
[:WORKSWITH]->(mr),
95      (imz)-[:KNOWS]->(mr), (imz)-[:SCHOOLWITH]->(mr),
96      (iz)-[:SCHOOLWITH]->(mr),
97      (ah)-[:KNOWS]->(mr), (ah)-[:SCHOOLWITH]->(mr), (ah)-
[:WORKSWITH]->(mr),
98      (vp:Person { name: "Veronika",
99                  worksAt: "SDC",
100                 schoolAt: "Florida Poly" }),
101      (gl)-[:KNOWS]->(vp), (gl)-[:SCHOOLWITH]->(vp), (gl)-
[:WORKSWITH]->(vp),
102      (aa)-[:SCHOOLWITH]->(vp),
103      (hs)-[:KNOWS]->(vp), (hs)-[:SCHOOLWITH]->(vp),
104      (jg)-[:SCHOOLWITH]->(vp),
105      (imz)-[:KNOWS]->(vp), (imz)-[:SCHOOLWITH]->(vp),
106      (iz)-[:KNOWS]->(vp), (iz)-[:SCHOOLWITH]->(vp),
107      (ah)-[:SCHOOLWITH]->(vp),
108      (mr)-[:KNOWS]->(vp), (mr)-[:SCHOOLWITH]->(vp),
109      (al:Person { name: "Ayden",
110                  from: "Tallahassee",
111                  worksAt: "SDC",
112                  schoolAt: "Florida Poly" }),
113      (gl)-[:KNOWS]->(al), (gl)-[:SCHOOLWITH]->(al), (gl)-
[:WORKSWITH]->(al),

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114         (aa)-[:SCHOOLWITH]->(al),
115         (hs)-[:SCHOOLWITH]->(al),
116         (jg)-[:SCHOOLWITH]->(al),
117         (imz)-[:KNOWS]->(al), (imz)-[:SCHOOLWITH]->(al),
118         (iz)-[:SCHOOLWITH]->(al),
119         (ah)-[:SCHOOLWITH]->(al),
120         (mr)-[:SCHOOLWITH]->(al),
121         (vp)-[:KNOWS]->(al), (vp)-[:SCHOOLWITH]->(al), (vp)-
[:WORKSWITH]->(al),
122         (vc:Person { name: "Val",
123                     worksAt: "SDC",
124                     schoolAt: "Florida Poly" }),
125         (gl)-[:KNOWS]->(vc), (gl)-[:SCHOOLWITH]->(vc), (gl)-
[:WORKSWITH]->(vc),
126         (aa)-[:SCHOOLWITH]->(vc),
127         (hs)-[:KNOWS]->(vc), (hs)-[:SCHOOLWITH]->(vc),
128         (jg)-[:KNOWS]->(vc), (jg)-[:SCHOOLWITH]->(vc),
129         (imz)-[:KNOWS]->(vc), (imz)-[:SCHOOLWITH]->(vc),
130         (iz)-[:KNOWS]->(vc), (iz)-[:SCHOOLWITH]->(vc), (iz)-
[:ROOMIESWITH]->(vc),
131         (ah)-[:KNOWS]->(vc), (ah)-[:SCHOOLWITH]->(al),
132         (mr)-[:KNOWS]->(vc), (mr)-[:SCHOOLWITH]->(al),
133         (vp)-[:KNOWS]->(vc), (vp)-[:SCHOOLWITH]->(vc), (vp)-
[:WORKSWITH]->(vc),
134         (al)-[:KNOWS]->(vc), (al)-[:SCHOOLWITH]->(vc), (al)-
[:WORKSWITH]->(vc),
135         (dl:Person { name: "Derek",
136                     from: "Lakeland",
137                     worksAt: "SDC",
138                     schoolAt: "UCF" }),
139         (gl)-[:KNOWS]->(dl), (gl)-[:WORKSFOR]->(dl),
140         (hs)-[:KNOWS]->(dl),
141         (jg)-[:KNOWS]->(dl),
142         (imz)-[:KNOWS]->(dl),
143         (iz)-[:KNOWS]->(dl),
144         (ah)-[:KNOWS]->(dl),
145         (mr)-[:KNOWS]->(dl),
146         (vp)-[:KNOWS]->(dl), (vp)-[:WORKSFOR]->(dl),
147         (al)-[:KNOWS]->(dl), (al)-[:WORKSFOR]->(dl),
148         (rs:Person { name: "Rahne",
149                     from: "Spring Hill",
150                     worksAt: "TGH" }),
151         (gl)-[:KNOWS]->(rs),
152         (hs)-[:KNOWS]->(rs), (hs)-[:RELATEDTO]->(rs),
153         (jg)-[:KNOWS]->(rs),
154         (imz)-[:KNOWS]->(rs),

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155         (iz)-[:KNOWS]->(rs),
156         (mr)-[:KNOWS]->(rs),
157     (bs:Person { name: "Brenda",
158                 from: "Boston",
159                 worksAt: "FCC" }),
160     (gl)-[:KNOWS]->(rs),
161     (hs)-[:KNOWS]->(rs), (hs)-[:RELATEDTO]->(rs),
162     (rs)-[:KNOWS]->(bs), (rs)-[:RELATEDTO]->(bs), (rs)-
163     [:ROOMIESWITH]->(bs)

164 MATCH p=()-[:KNOWS]->() RETURN p
165 MATCH p=()-[:RELATEDTO]->() RETURN p
166 MATCH p=()-[:ROOMIESWITH]->() RETURN p
167 MATCH p=()-[:SCHOOLWITH]->() RETURN p
168 MATCH p=()-[:WORKSFOR]->() RETURN p
169 MATCH p=()-[:WORKSWITH]->() RETURN p

```

## Code and Results

### Initial Setup

```

1  CREATE (me:Person { name: "Gus",
2                        from: "Boston",
3                        worksAt: "SGA, SDC",
4                        schoolAt: "Florida Poly"})
5
6  CREATE (hs:Person { name: "Hail",
7                      from: "Spring Hill",
8                      worksAt: "SGA",
9                      schoolAt: "Florida Poly" }),
10     (gl)-[:KNOWS]->(hs), (gl)-[:WORKSWITH]->(hs), (gl)-[:SCHOOLWITH]-
11     >(hs),
12     (aa:Person { name: "Austin",
13                 from: "San Francisco",
14                 schoolAt: "Florida Poly" }),
15     (gl)-[:KNOWS]->(aa), (gl)-[:SCHOOLWITH]->(aa),
16     (hs)-[:KNOWS]->(aa), (hs)-[:SCHOOLWITH]->(aa),
17     (jg:Person { name: "Jake",
18                 from: "Miami",
19                 worksAt: "SGA, Draken",
20                 schoolAt: "Florida Poly" }),
21     (gl)-[:KNOWS]->(jg), (gl)-[:WORKSWITH]->(jg), (gl)-
22     [:SCHOOLWITH]->(jg),
23     (imz:Person { name: "Izzy",

```

```

22         from: "Boca Raton",
23         worksAt: "Draken",
24         schoolAt: "Florida Poly" })),
25         (gl)-[:KNOWS]->(imz), (gl)-[:SCHOOLWITH]->(imz), (gl)-
[:ROOMIESWITH]->(imz),
26         (aa)-[:KNOWS]->(imz), (aa)-[:SCHOOLWITH]->(imz),
27         (hs)-[:KNOWS]->(imz), (hs)-[:SCHOOLWITH]->(imz),
28         (jg)-[:KNOWS]->(imz), (jg)-[:WORKSWITH]->(imz), (jg)-
[:SCHOOLWITH]->(imz),
29         (ts:Person { name: "Tucker",
30         from: "Jupiter",
31         worksAt: "M&M Systems",
32         schoolAt: "Florida Poly" })),
33         (gl)-[:KNOWS]->(ts), (gl)-[:SCHOOLWITH]->(ts),
34         (hs)-[:KNOWS]->(ts),
35         (imz)-[:KNOWS]->(ts),
36         (lm:Person { name: "Lukas",
37         from: "Jupiter",
38         worksAt: "M&M Systems",
39         schoolAt: "Florida Poly" })),
40         (gl)-[:KNOWS]->(ts), (gl)-[:SCHOOLWITH]->(ts),
41         (hs)-[:KNOWS]->(ts),
42         (ts)-[:KNOWS]->(lm), (ts)-[:WORKSWITH]->(lm), (ts)-
[:SCHOOLWITH]->(lm),
43         (ml:Person { name: "Macy",
44         from: "Boston",
45         worksAt: "NENC",
46         schoolAt: "Wellesley" })),
47         (gl)-[:KNOWS]->(ml), (gl)-[:RELATEDTO]->(ml),
48         (imz)-[:KNOWS]->(ml),
49         (m:Person { name: "Mom",
50         from: "Commack",
51         worksAt: "Mass DPH",
52         schoolAt: "Oberlin" })),
53         (gl)-[:KNOWS]->(m), (gl)-[:RELATEDTO]->(m),
54         (ml)-[:KNOWS]->(m), (ml)-[:RELATEDTO]->(m),
55         (eh:Person { name: "Esther",
56         from: "Long Island" })),
57         (gl)-[:KNOWS]->(eh),
58         (ml)-[:KNOWS]->(eh),
59         (m)-[:KNOWS]->(eh),
60         (iz:Person { name: "Isabel",
61         from: "Peoria",
62         worksAt: "RStudio",
63         schoolAt: "Florida Poly" })),
64         (gl)-[:KNOWS]->(imz), (gl)-[:SCHOOLWITH]->(iz),

```

```

65         (aa)-[:KNOWS]->(imz), (aa)-[:SCHOOLWITH]->(iz),
66         (hs)-[:KNOWS]->(imz), (hs)-[:SCHOOLWITH]->(iz),
67         (jg)-[:KNOWS]->(imz), (jg)-[:SCHOOLWITH]->(imz),
68         (imz)-[:KNOWS]->(iz), (imz)-[:SCHOOLWITH]->(iz),
69         (ch:Person { name: "Chris",
70                     from: "Boston",
71                     worksAt: "MSA",
72                     schoolAt: "Bates" })),
73         (gl)-[:KNOWS]->(ch),
74         (ml)-[:KNOWS]->(ch),
75         (m)-[:KNOWS]->(ch),
76         (imz)-[:KNOWS]->(ch),
77         (ah:Person { name: "Antonio",
78                     from: "Tampa",
79                     worksAt: "SGA",
80                     schoolAt: "Florida Poly" })),
81         (gl)-[:KNOWS]->(ah), (gl)-[:SCHOOLWITH]->(ah), (gl)-
[:WORKSWITH]->(ah),
82         (aa)-[:SCHOOLWITH]->(ah),
83         (hs)-[:KNOWS]->(ah), (hs)-[:SCHOOLWITH]->(ah), (hs)-
[:WORKSWITH]->(ah),
84         (jg)-[:KNOWS]->(ah), (jg)-[:SCHOOLWITH]->(ah), (jg)-
[:WORKSWITH]->(ah),
85         (imz)-[:SCHOOLWITH]->(ah),
86         (iz)-[:SCHOOLWITH]->(ah),
87         (mr:Person { name: "Melia",
88                     from: "Boca Raton",
89                     worksAt: "SGA",
90                     schoolAt: "Florida Poly" })),
91         (gl)-[:KNOWS]->(mr), (gl)-[:SCHOOLWITH]->(mr), (gl)-
[:WORKSWITH]->(mr),
92         (aa)-[:SCHOOLWITH]->(mr),
93         (hs)-[:KNOWS]->(mr), (hs)-[:SCHOOLWITH]->(mr), (hs)-
[:WORKSWITH]->(mr),
94         (jg)-[:KNOWS]->(mr), (jg)-[:SCHOOLWITH]->(mr), (jg)-
[:WORKSWITH]->(mr),
95         (imz)-[:KNOWS]->(mr), (imz)-[:SCHOOLWITH]->(mr),
96         (iz)-[:SCHOOLWITH]->(mr),
97         (ah)-[:KNOWS]->(mr), (ah)-[:SCHOOLWITH]->(mr), (ah)-
[:WORKSWITH]->(mr),
98         (vp:Person { name: "Veronika",
99                     worksAt: "SDC",
100                    schoolAt: "Florida Poly" })),
101         (gl)-[:KNOWS]->(vp), (gl)-[:SCHOOLWITH]->(vp), (gl)-
[:WORKSWITH]->(vp),
102         (aa)-[:SCHOOLWITH]->(vp),

```





```

143         (lz)-[:KNOWS]->(dl),
144         (ah)-[:KNOWS]->(dl),
145         (mr)-[:KNOWS]->(dl),
146         (vp)-[:KNOWS]->(dl), (vp)-[:WORKSFOR]->(dl),
147         (al)-[:KNOWS]->(dl), (al)-[:WORKSFOR]->(dl),
148     (rs:Person { name: "Rahne",
149                 from: "Spring Hill",
150                 worksAt: "TGH" }),
151     (gl)-[:KNOWS]->(rs),
152     (hs)-[:KNOWS]->(rs), (hs)-[:RELATEDTO]->(rs),
153     (jg)-[:KNOWS]->(rs),
154     (imz)-[:KNOWS]->(rs),
155     (iz)-[:KNOWS]->(rs),
156     (mr)-[:KNOWS]->(rs),
157     (bs:Person { name: "Brenda",
158                 from: "Boston",
159                 worksAt: "FCC" }),
160     (gl)-[:KNOWS]->(rs),
161     (hs)-[:KNOWS]->(rs), (hs)-[:RELATEDTO]->(rs),
162     (rs)-[:KNOWS]->(bs), (rs)-[:RELATEDTO]->(bs), (rs)-
[:ROOMIESWITH]->(bs)

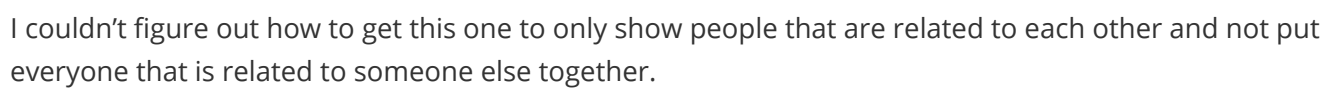
```

## Returning Queries

```

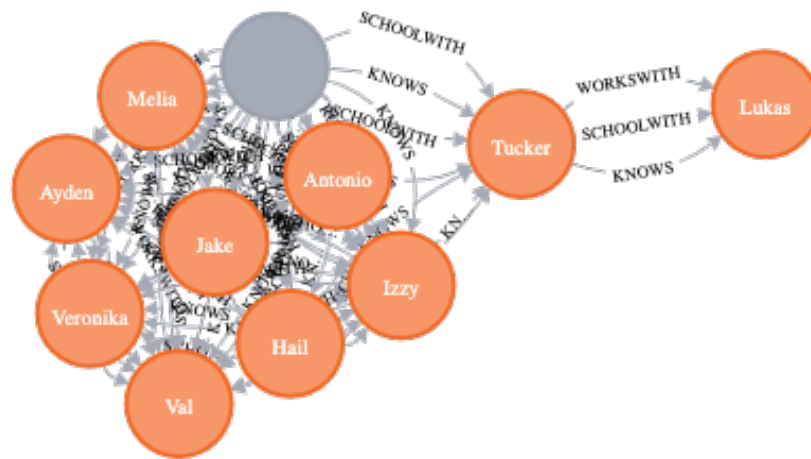
1 | MATCH p=()-[r:KNOWS]->() RETURN p

```



```
1 MATCH p=()-[r:ROOMIESWITH]->() RETURN p
```

```
1 MATCH p=()-[r:WORKSWITH]->() RETURN p
```



Same problem here too.