W205 summer 2017 section 2 – Lab09 - K Iwasaki

1. *What is the shortest path between 'DR. STRANGE/STEPHEN' and 'DR. DOOM/VICTOR VON'?*

Query and Result

```
MATCH p=(s:Hero {name: 'DR. STRANGE/STEPHEN'})-[:APPEARED*0..2]-(d:Hero {name: 'DR. DOOM/VICTOR VON'})
    RETURN p, length(p)
    ORDER BY length(p)
    LIMIT 1
```

```
$ MATCH p=(s:Hero {name: 'DR. STRANGE/STEPHEN'})-[:APPEARED*0..2]-(d:Hero {name: 'DR. DOOM/VICTOR VON'}) RETURN p, length(p) O
```

Graph Table Text

```
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│"p"                                                                    │"length(p)"│
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│[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":8},{"name":"DR. DOOM │1          │
│/VICTOR VON","degree":441}]                                            │           │
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```

Answer: The shortest path is length 1 between DR. STRANGE and DR. DOOM.

2. *List the 5 shortest paths between 'DR. STRANGE/STEPHEN' and 'DR. DOOM/VICTOR VON'.*

Query and Result

```
MATCH p=(s:Hero {name: 'DR. STRANGE/STEPHEN'})-[:APPEARED*0..2]-(d:Hero {name: 'DR. DOOM/VICTOR VON'})
    RETURN p, length(p)
    ORDER BY length(p)
    LIMIT 10
```

```
$ MATCH p=(s:Hero {name: 'DR. STRANGE/STEPHEN'})-[:APPEARED*0..2]-(d:Hero {name: 'DR. DOOM/VICTOR VON'}) RETURN p, length(p) (
```

Graph Table Text Code

```
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│"p"                                                                    │"length(p)"│
╞═══════════════════════════════════════════════════════════════════════╪═══════════╡
│[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":8},{"name":"DR. DOOM │1          │
│/VICTOR VON","degree":441}]                                            │           │
├───────────────────────────────────────────────────────────────────────┼───────────┤
│[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":12},{"name":"DR. DOO │1          │
│M/VICTOR VON","degree":441}]                                           │           │
├───────────────────────────────────────────────────────────────────────┼───────────┤
│[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":3},{"name":"CAPTAIN  │2          │
│BRITAIN/BRIA","degree":327},{"name":"CAPTAIN BRITAIN/BRIA","degree":32 │           │
│7},{"w":2},{"name":"DR. DOOM/VICTOR VON","degree":441}]                │           │
├───────────────────────────────────────────────────────────────────────┼───────────┤
│[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":3},{"name":"CAPTAIN  │2          │
│BRITAIN/BRIA","degree":327},{"name":"CAPTAIN BRITAIN/BRIA","degree":32 │           │
│7},{"w":1},{"name":"DR. DOOM/VICTOR VON","degree":441}]                │           │
├───────────────────────────────────────────────────────────────────────┼───────────┤
│[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":1},{"name":"REDWING" │2          │
│,"degree":175},{"name":"REDWING","degree":175},{"w":1},{"name":"DR. DO │           │
│OM/VICTOR VON","degree":441}]                                          │           │
├───────────────────────────────────────────────────────────────────────┼───────────┤
│[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":2},{"name":"THUNDERB │2          │
│ALL/DR. ELIO","degree":138},{"name":"THUNDERBALL/DR. ELIO","degree":13 │           │
│8},{"w":6},{"name":"DR. DOOM/VICTOR VON","degree":441}]                │           │
└───────────────────────────────────────────────────────────────────────┴───────────┘
```
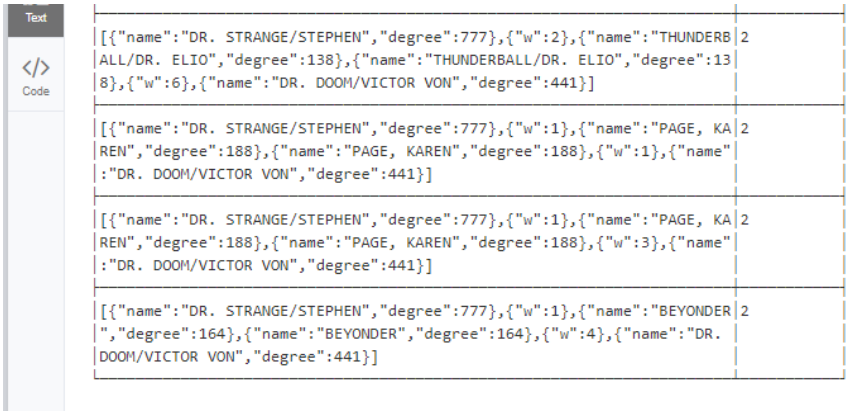



[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":2},{"name":"THUNDERBALL/DR. ELIO","degree":138},{"name":"THUNDERBALL/DR. ELIO","degree":138},{"w":6},{"name":"DR. DOOM/VICTOR VON","degree":441}]	2
[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":1},{"name":"PAGE, KAREN","degree":188},{"name":"PAGE, KAREN","degree":188},{"w":1},{"name":"DR. DOOM/VICTOR VON","degree":441}]	2
[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":1},{"name":"PAGE, KAREN","degree":188},{"name":"PAGE, KAREN","degree":188},{"w":3},{"name":"DR. DOOM/VICTOR VON","degree":441}]	2
[{"name":"DR. STRANGE/STEPHEN","degree":777},{"w":1},{"name":"BEYONDER","degree":164},{"name":"BEYONDER","degree":164},{"w":4},{"name":"DR. DOOM/VICTOR VON","degree":441}]	2

Answer:

1. '*DR. STRANGE/STEPHEN*' and '*DR. DOOM/VICTOR VON*' *are* connected directly (length1)
2. They are connected through "CAPTAIN BRITAIN/BRIA" (length2)
3. They are connected through "REDWING" (length2)
4. They are connected through "THUNDERBALL/DR. ELIO" (length2)
5. They are connected through "PAGE, KAREN" (length2)

3. *List 5 Friends of Friends of '*COLOSSUS II/PETER RA*' with the most connections.*

Query and Result

```
MATCH (peter:Hero { name: 'COLOSSUS II/PETER RA' })-[:APPEARED*2..2]-(friend_of_friend)
    WHERE NOT (peter)-[:APPEARED]-(friend_of_friend)
    AND friend_of_friend.name <> 'COLOSSUS II/PETER RA'
    RETURN friend_of_friend.name, COUNT(*)
    ORDER BY COUNT(*) DESC , friend_of_friend.name
    LIMIT 5
```

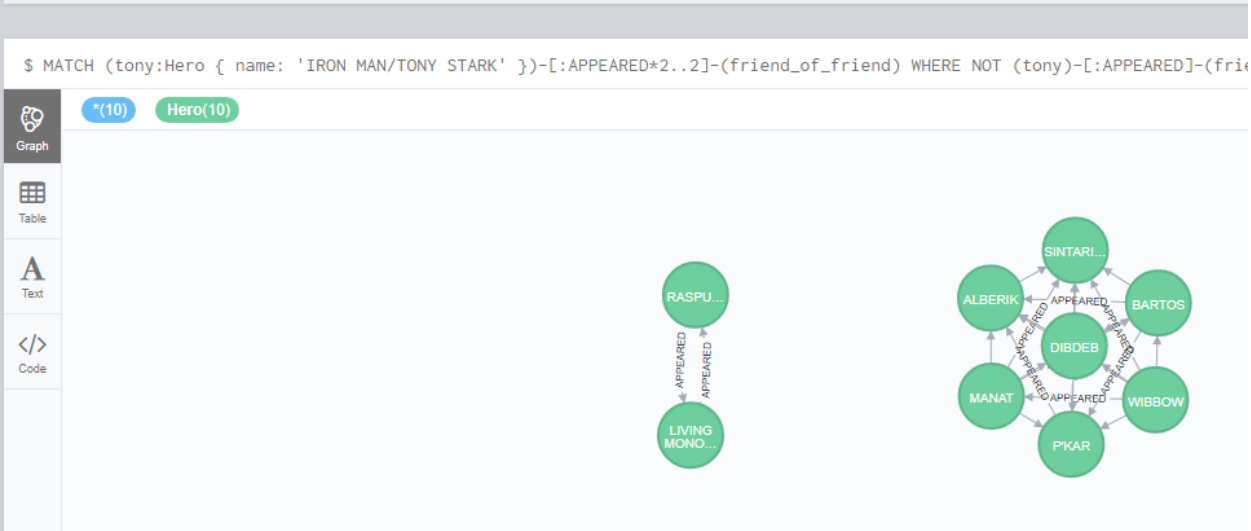
```
$ MATCH (peter:Hero { name: 'COLOSSUS II/PETER RA' })-[:APPEARED*2..2]-(friend_of_friend) WHERE NOT (peter)-[:A
```

"friend_of_friend.name"	"COUNT(*)"
"WONG"	453
"MOONSTONE II/KARLA S"	370
"CARTER, PEGGY"	367
"POWER MAN/ERIK JOSTE"	350
"KINGPIN/WILSON FISK"	342

4. *Visualize 10 Friends of friends for 'IRON MAN/TONY STARK'.*

Query and Result

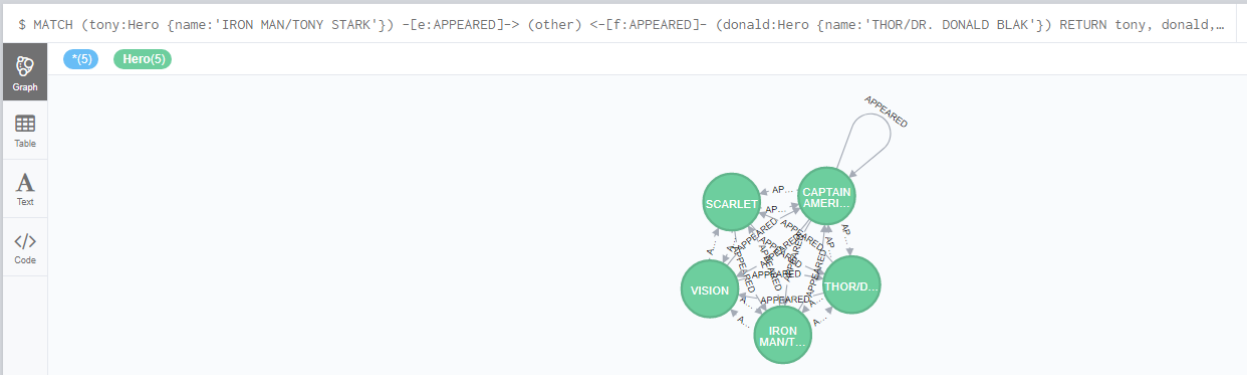
```
MATCH (tony:Hero { name: 'IRON MAN/TONY STARK' })-[:APPEARED*2..2]-(friend_of_friend)
WHERE NOT (tony)-[:APPEARED]-(friend_of_friend)
AND friend_of_friend.name <> 'IRON MAN/TONY STARK'
RETURN friend_of_friend
LIMIT 10
```



5. *Visually discover how the Avengers grew over time from 5 to 10 members, who was added to the team, and verify connectivity.*

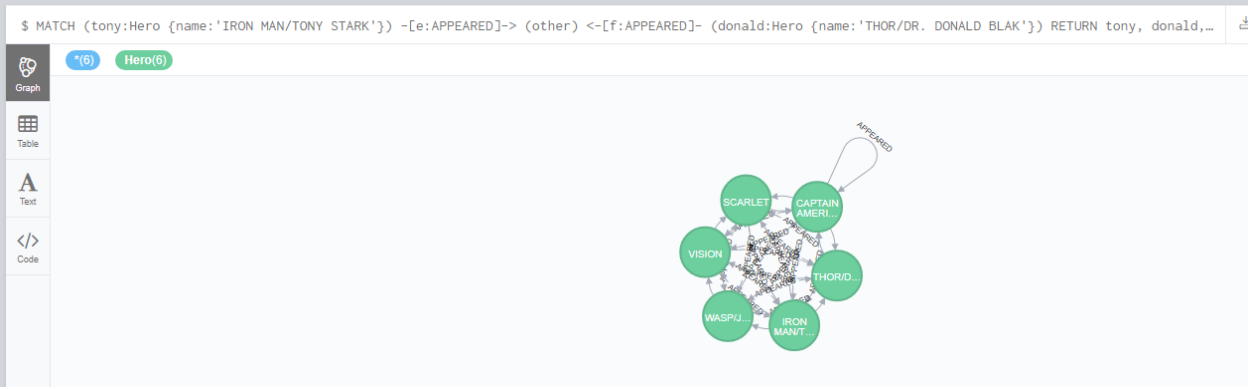
LIMIT of 3 to return 5 members: The graph is fully connected

```
MATCH (tony:Hero {name:'IRON MAN/TONY STARK'}) -[e:APPEARED]-> (other) <-[f:APPEARED]- (donald:Hero {name:'THOR/DR. DONALD BLAK'})
    RETURN tony, donald, other
    ORDER BY e.w DESC, f.w DESC
    LIMIT 3
```



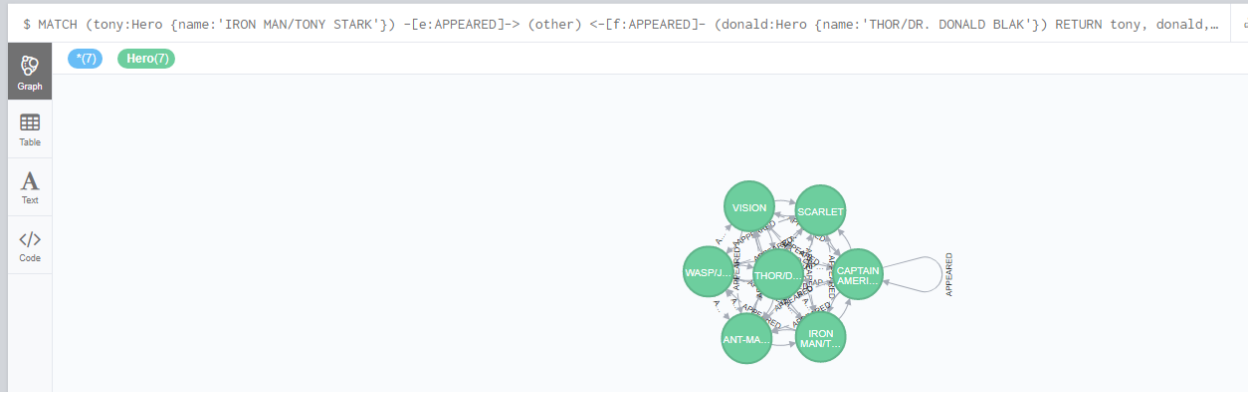
LIMIT of 4 to return 6 members: The graph is fully connected

```
MATCH (tony:Hero {name:'IRON MAN/TONY STARK'}) -[e:APPEARED]-> (other) <-[f:APPEARED]- (donald:Hero {name:'THOR/DR. DONALD BLAK'})
    RETURN tony, donald, other
    ORDER BY e.w DESC, f.w DESC
    LIMIT 4
```



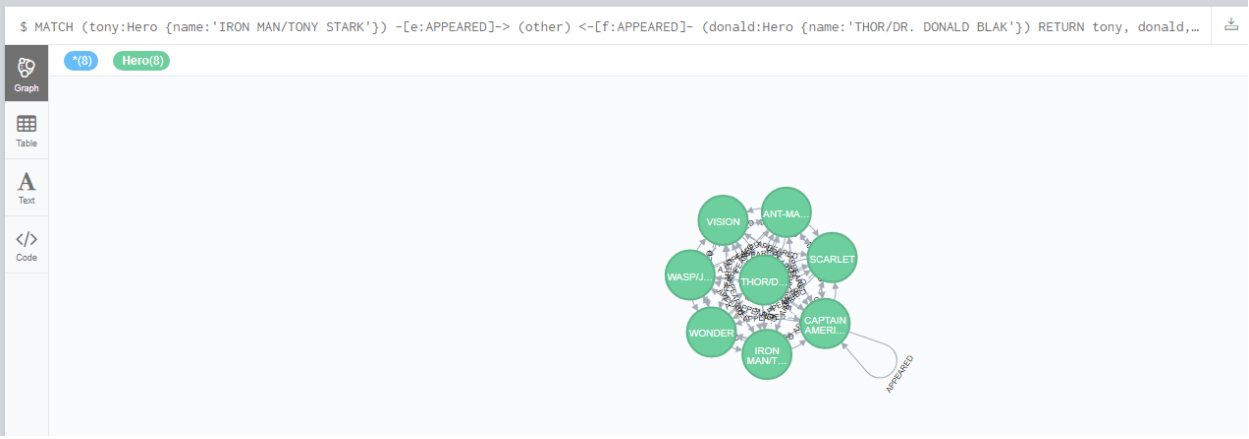
LIMIT of 5 to return 7 members: The graph is fully connected

```
MATCH (tony:Hero {name:'IRON MAN/TONY STARK'}) -[e:APPEARED]-> (other) <-[f:APPEARED]- (donald:Hero {name:'THOR/DR. DONALD BLAK'})
    RETURN tony, donald, other
    ORDER BY e.w DESC, f.w DESC
    LIMIT 5
```



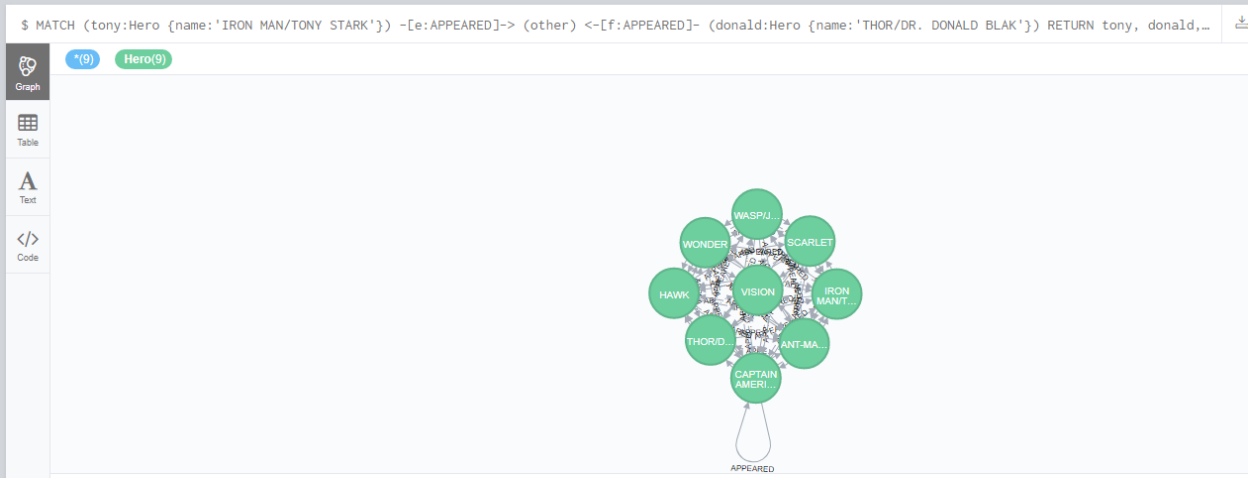
LIMIT of 6 to return 8 members: The graph is fully connected

```
MATCH (tony:Hero {name:'IRON MAN/TONY STARK'}) -[e:APPEARED]-> (other) <-[f:APPEARED]- (donald:Hero {name:'THOR/DR. DONALD BLAK'})
    RETURN tony, donald, other
    ORDER BY e.w DESC, f.w DESC
    LIMIT 6
```



LIMIT of 7 to return 9 members: The graph is fully connected

```
MATCH (tony:Hero {name:'IRON MAN/TONY STARK'}) -[e:APPEARED]-> (other) <-[f:APPEARED]- (donald:Hero {name:'THOR/DR. DONALD BLAK'})
    RETURN tony, donald, other
    ORDER BY e.w DESC, f.w DESC
    LIMIT 7
```



LIMIT of 8 to return 10 members: The graph is fully connected

```
MATCH (tony:Hero {name:'IRON MAN/TONY STARK'}) -[e:APPEARED]-> (other) <-[f:APPEARED]- (donald:Hero {name:'THOR/DR. DONALD BLAK'})
    RETURN tony, donald, other
    ORDER BY e.w DESC, f.w DESC
    LIMIT 8
```