A Network Tour of Data Science (EE-558)

A Growing Network of Characters In Marvel and DC Universes

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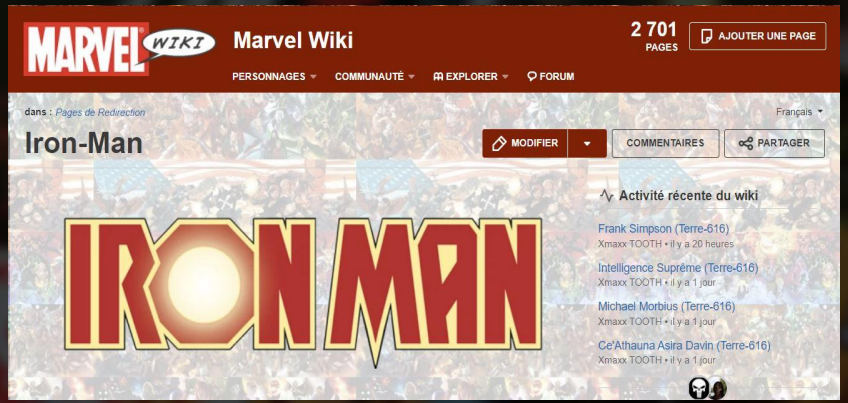
What characters are the key to the success of Marvel and DC universes ?

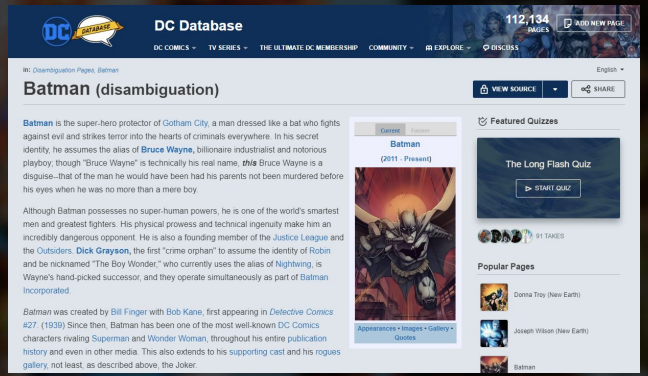
Which ones are more likely to appear in future comics, along with which other characters ?

Gathering the Data

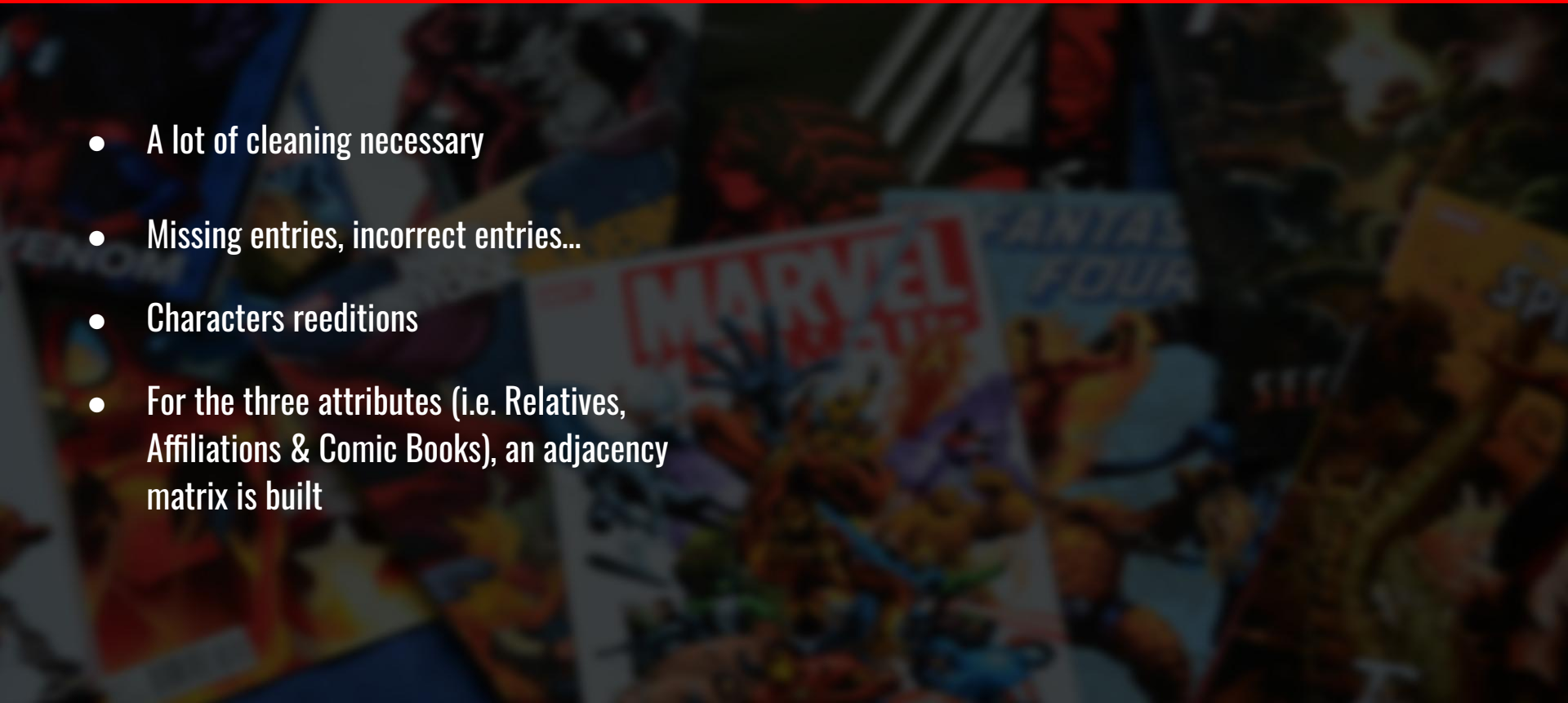
- Use of Marvel and DC fandom Wikis: more than 26’000 characters in Marvel universe and 13’000 in DC universe

- For each character, the gathered info is :
  - Name
  - Current Alias
  - Relatives
  - Affiliations
  - Comic book appearances





Treating the Data



- A lot of cleaning necessary
- Missing entries, incorrect entries...
- Characters reeditions
- For the three attributes (i.e. Relatives, Affiliations & Comic Books), an adjacency matrix is built

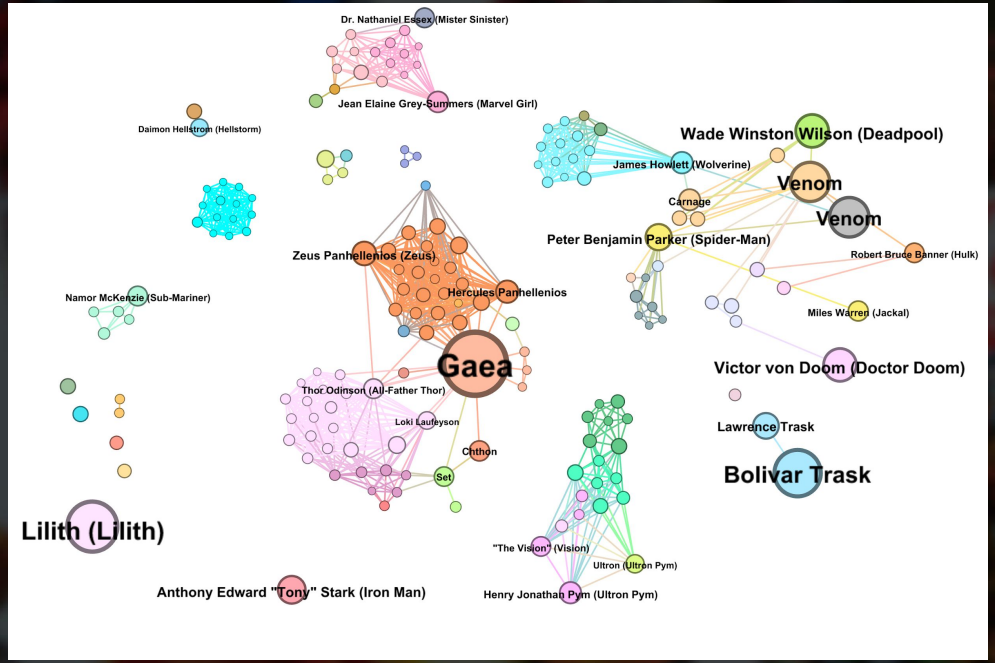
Influence of the relatives

Relatives Analysis

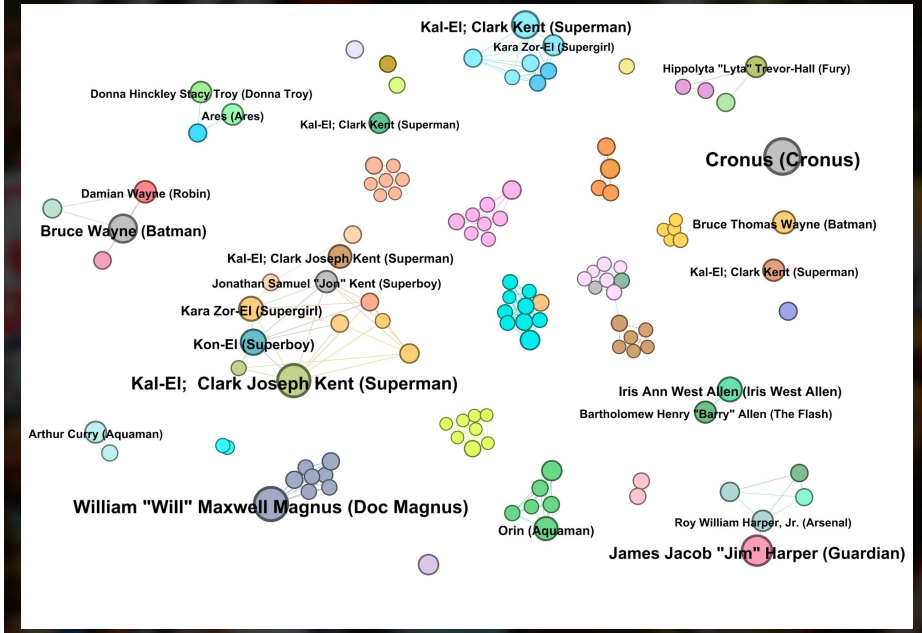
- Construction of an adjacency matrix
- The more relatives a character has, the bigger his node is
- Visualization using Gephi:
  - use of *ForceAtlas2* layout
  - use of *Degree Range* filter (threshold of 7 for DC and 17 for Marvel)
- Highlights big families

	Me	My brother	Elon Musk
Me		1	0
My brother	1		0
Elon Musk	0	0	

Relatives Analysis



Marvel Relatives Graph



DC Relatives Graph

Influence of the affiliation

Affiliation Analysis

- The more a character has common affiliations, the bigger his node is

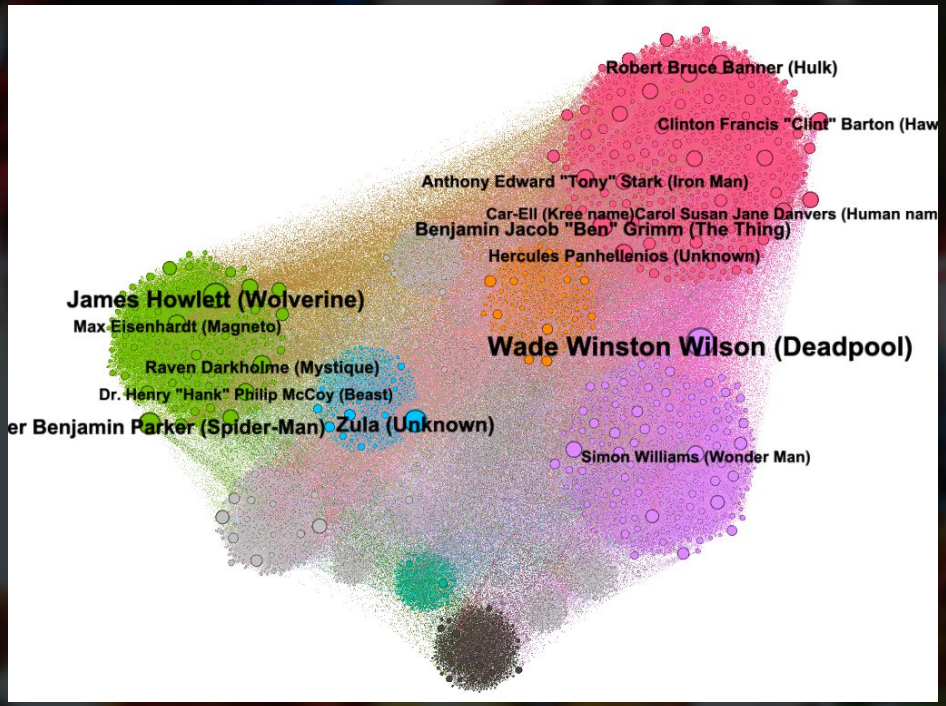
- Visualization using Gephi:
  - use of *Leiden's Algorithm*
  - use of *Circle Pack* layout
  - use of *PageRank* algorithm filtering

- Highlights characters with a lot of affiliations

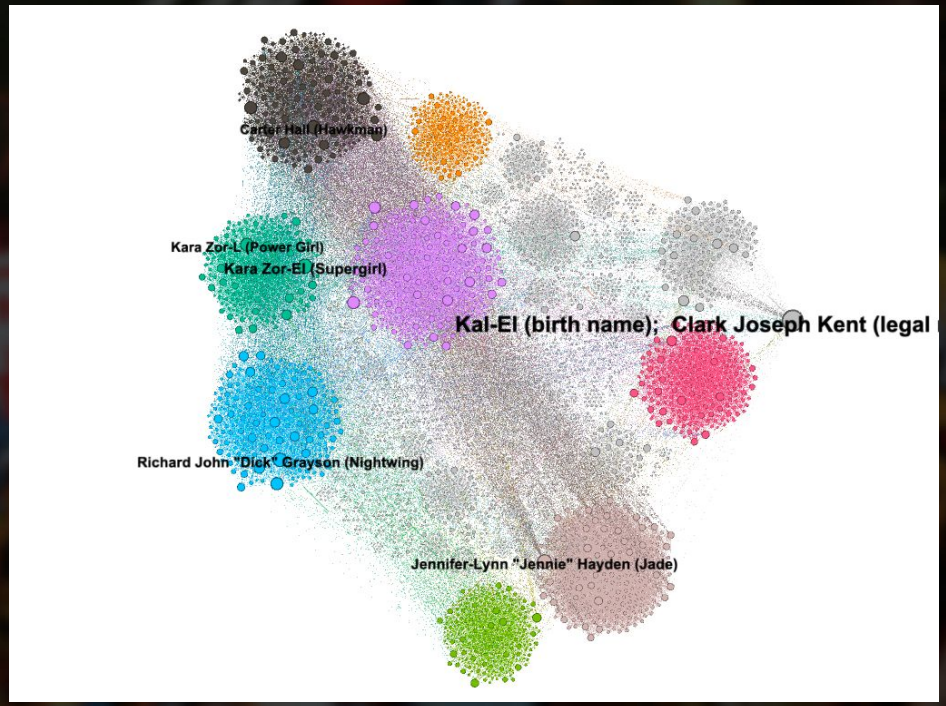
NAME	AFFILIATION
Me	EPFL, EL, Hyperloop, Musical
My brother	EPFL, GM, Musical
Elon Musk	TESLA, SpaceX, Hyperloop

	Me	My brother	Elon Musk
Me		2	1
My brother	2		0
Elon Musk	1	0	

Affiliation Analysis



Marvel Affiliation Graph



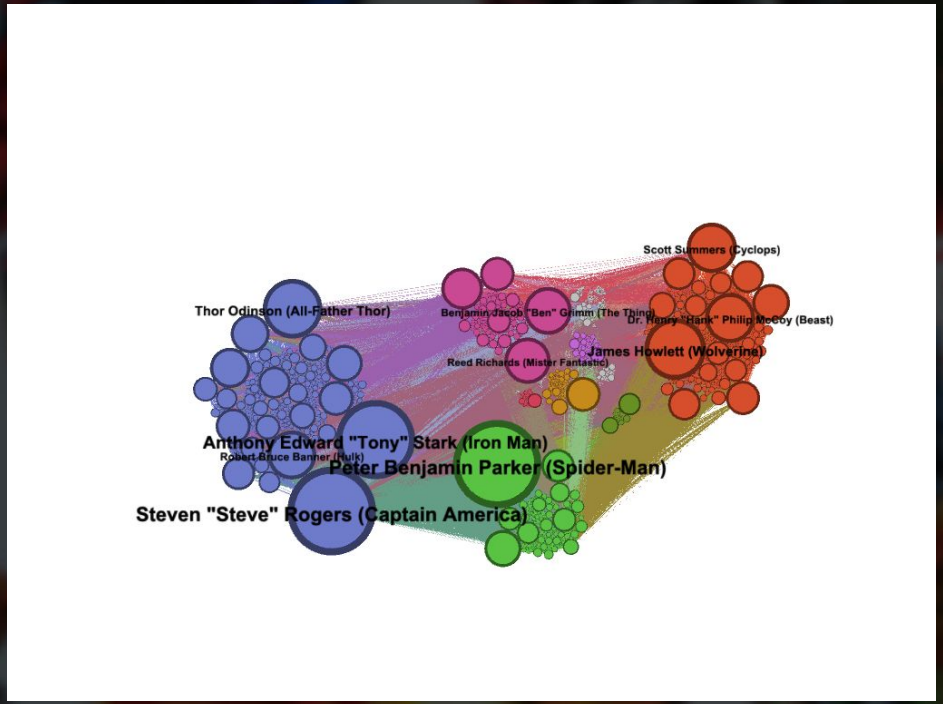
DC Affiliation Graph

Influence of the comics apparition

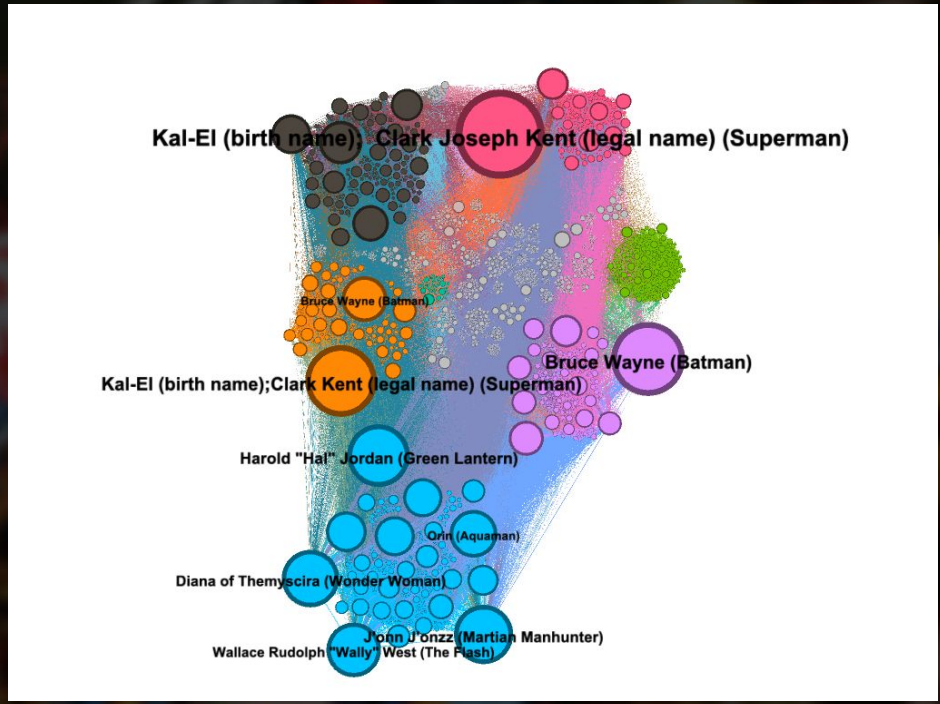
Comics Analysis

- Each time two character appears together we increase the weight
- Visualization using Gephi:
  - use of *Leiden's Algorithm*
  - use of *Circle Pack* layout
- Highlights "famous" character

Comics Analysis



Marvel Comics Graph



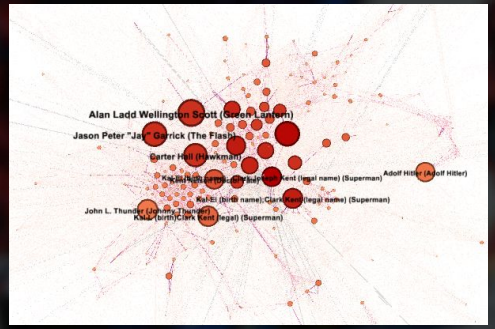
DC Comics Graph

Combination

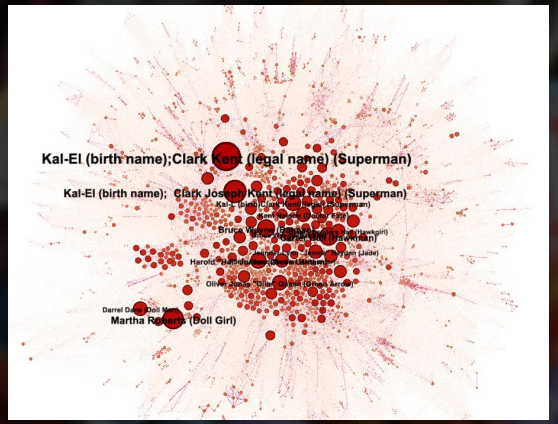
Combination Analysis

- Add normalized adjacency matrices
- Visualization using Gephi:
  - use of *OpenOrd* layout
  - use of *PageRank* algorithm
- Highlights “famous” character

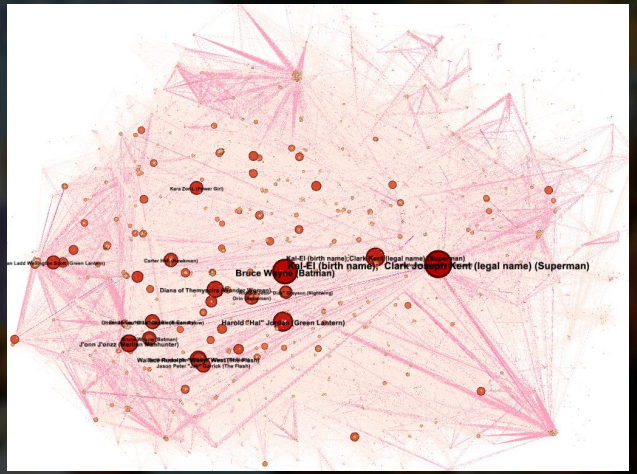
Combination Analysis



DC in 50’

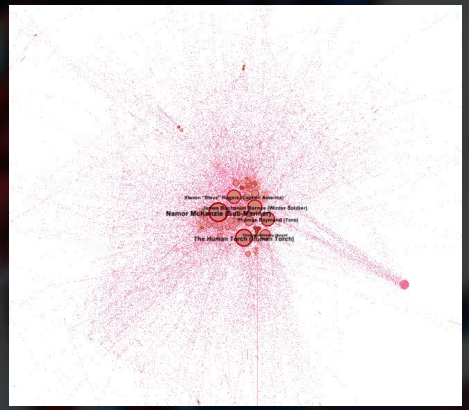


DC in 90’



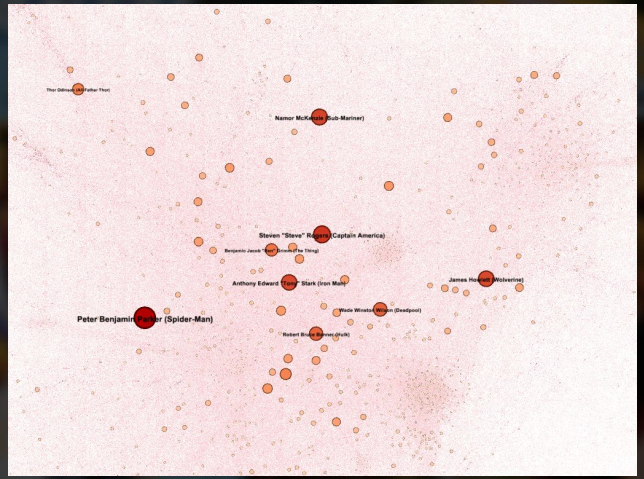
DC nowadays

Combination Analysis



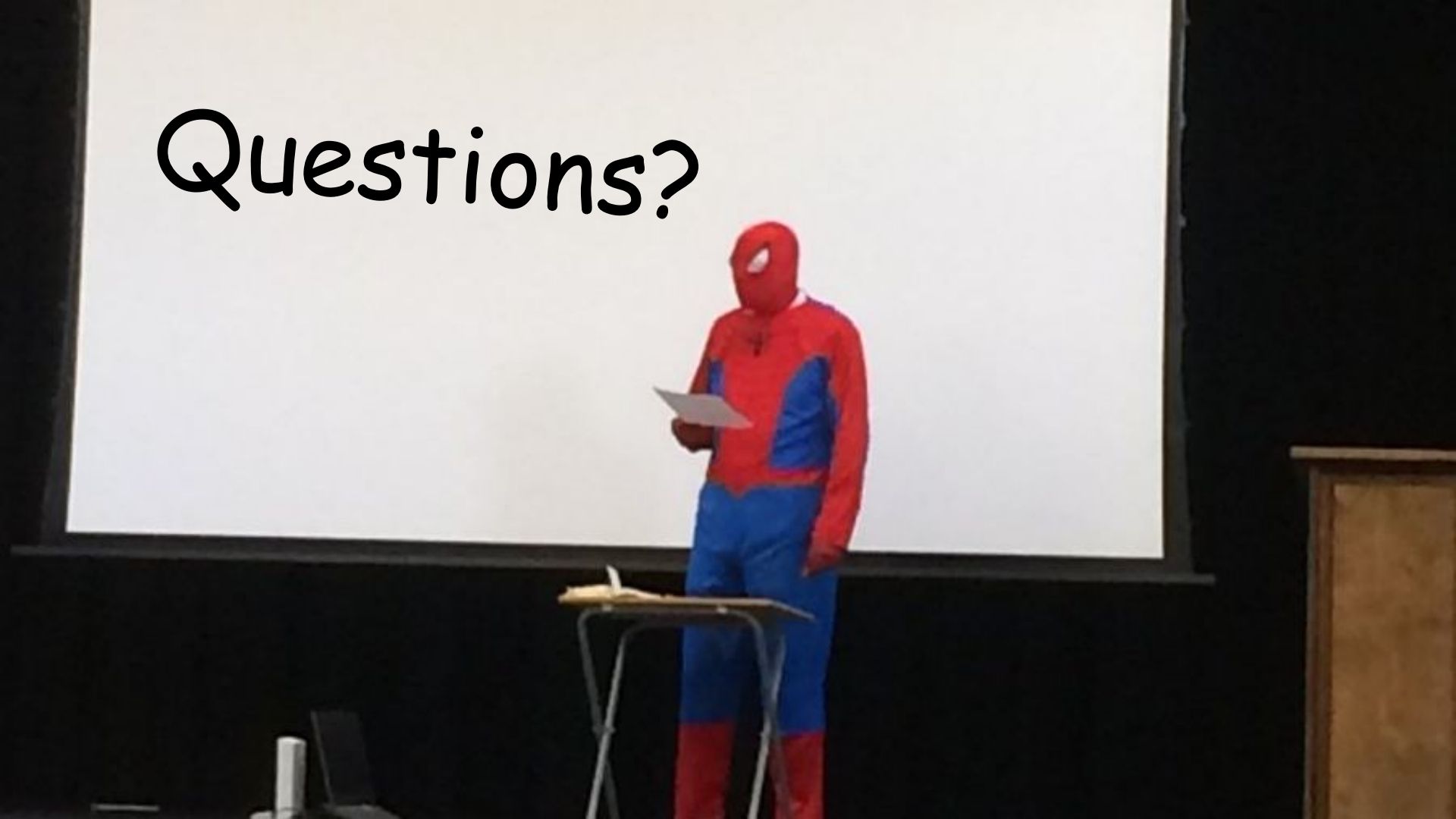
Marvel in 50’

Marvel in 90’



Marvel nowadays
(Zoomed)

Conclusion


Questions?