

15th IEEE International Conference on Semantic Computing
Resource Track

Relicensing Combined Datasets

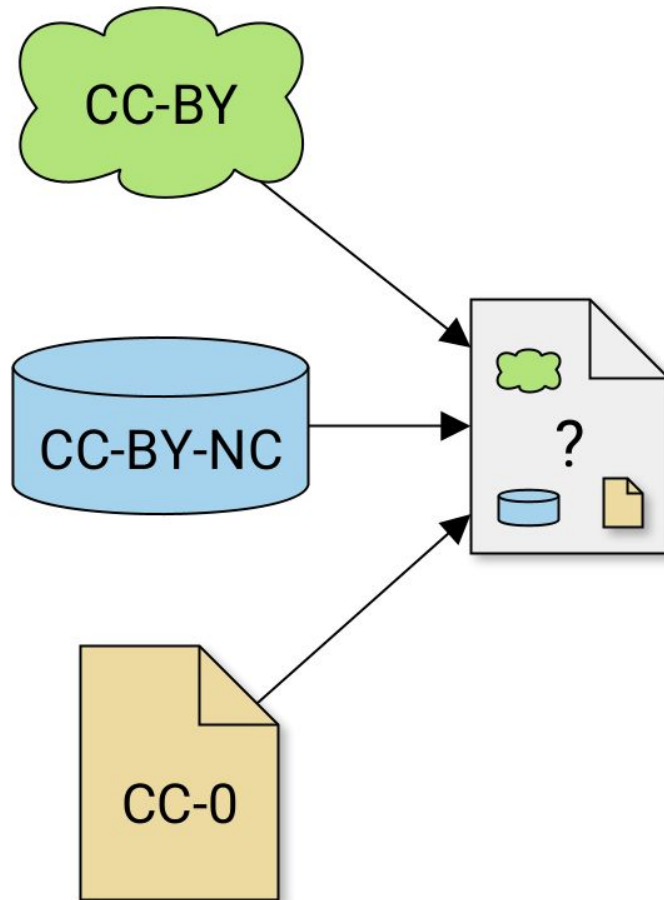
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Department of Computer Science
Paderborn University, Germany

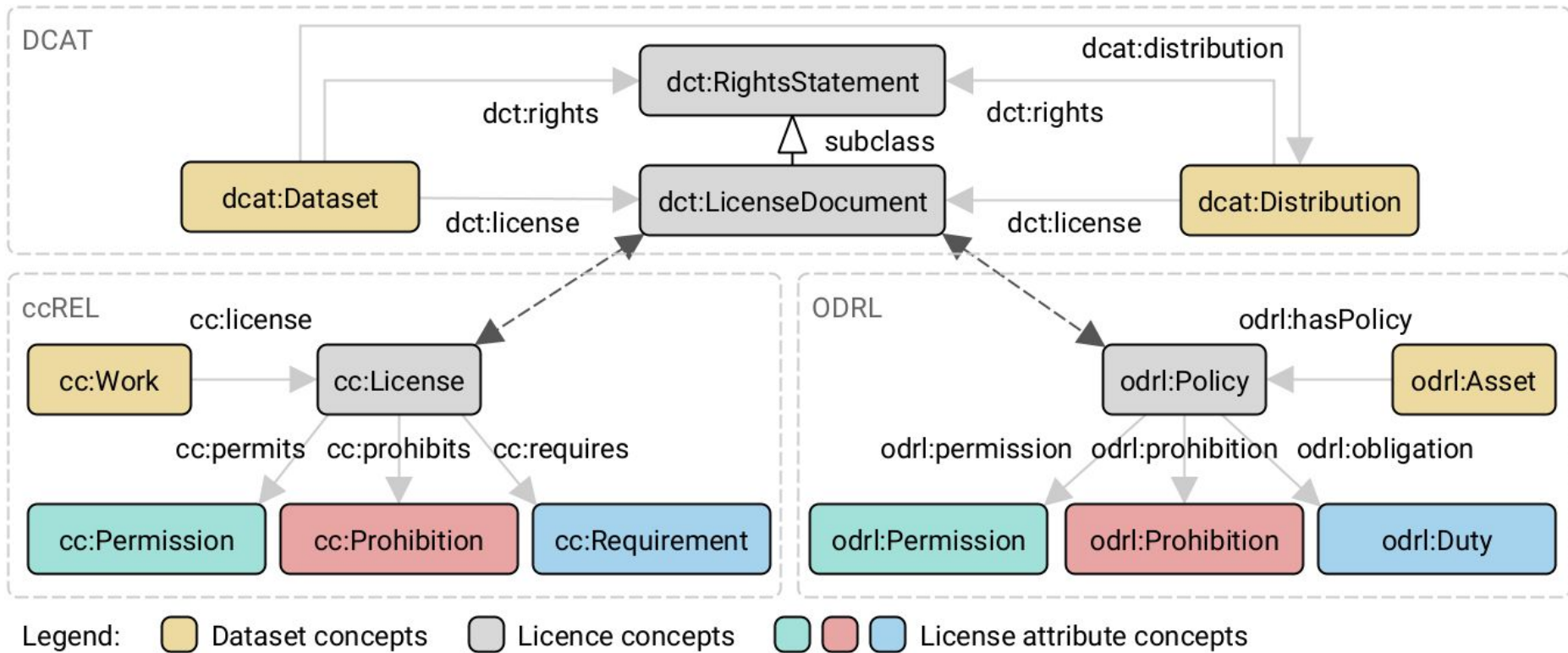


Relicensing Combined Datasets

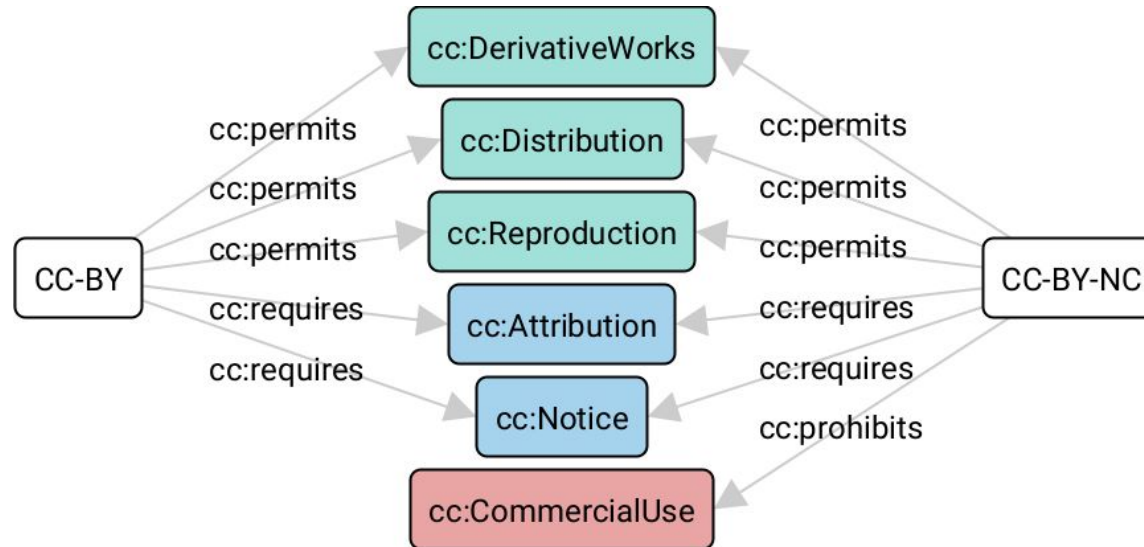


- ▶ Licensing Concepts & KGs
- ▶ ReCoDa Approach
 - Attributes to Binary Values
 - Attribute Types
 - Computation of Composite Attributes
 - Back-Mapping
- ▶ Evaluation
- ▶ Demo & Resources

Licensing Concepts



License Knowledge Graphs



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Credit be given to copyright holder and/or author

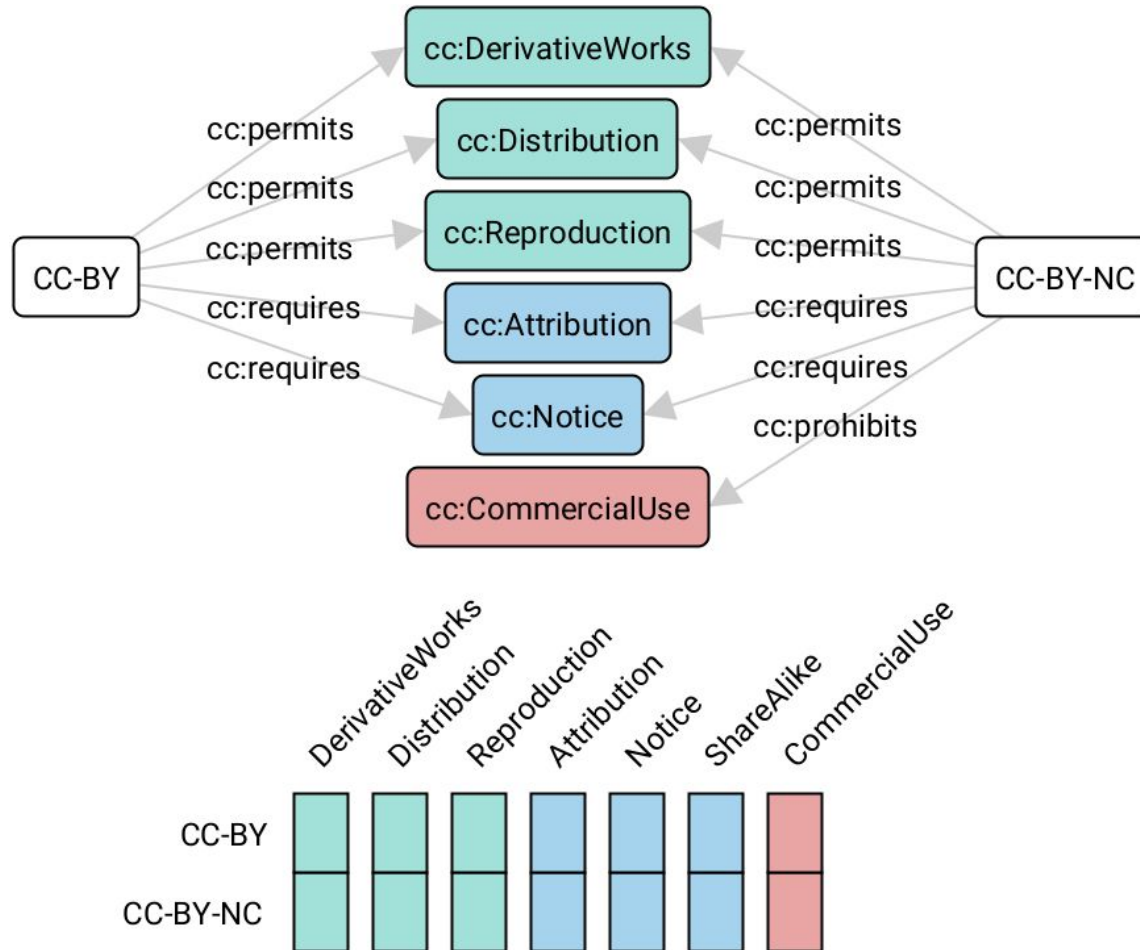
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ReCoDa Approach

1. Using Knowledge Graph: (licenses & attributes):
Mapping: License attributes to **binary values**
2. Semantics of **attribute types**:
Effects on the compatibility
3. Operator:
Generate **composite attributes**
4. **Back-mapping** of resulting attributes
 - List of compatible licenses

1. Mapping of Attributes to Binary Values



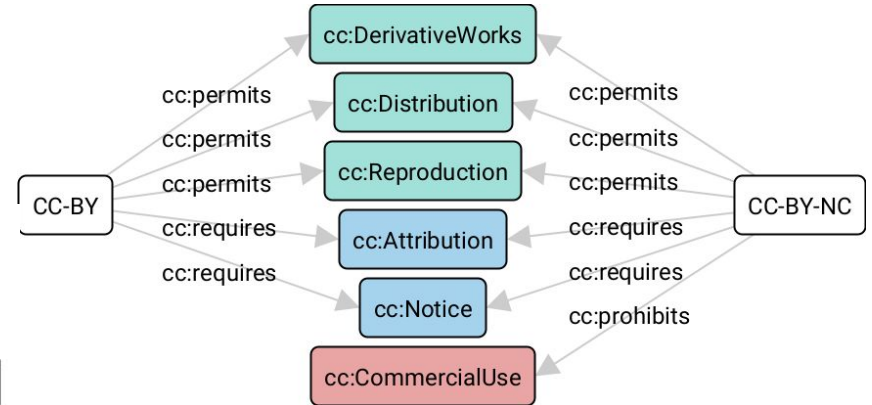
1. Mapping of Attributes to Binary Values

Mapping operator $\varphi : \mathcal{L} \rightarrow \{0, 1\}^n$

Permissions: $b = \begin{cases} 1 & \text{if not permitted} \\ 0 & \text{if permitted} \end{cases}$

Prohibitions: $b = \begin{cases} 1 & \text{if prohibited} \\ 0 & \text{if not prohibited} \end{cases}$

Requirements: $b = \begin{cases} 1 & \text{if required} \\ 0 & \text{if not required} \end{cases}$



	DerivativeWorks	Distribution	Reproduction	Attribution	Notice	ShareAlike	CommercialUse
CC-BY	0	0	0	1	1	0	0
CC-BY-NC	0	0	0	1	1	0	1

2. License Comparison Types

		License	DerivativeWorks	ShareAlike	Attribution	Notice	Result	
Type I License Level	A	1	0	0	1		No combination allowed	"distribution of derivative works" Permission: 1 if not permitted
	B	1	0	0	1			
Type II Attribute Equality	C	0	1	0	1		Licence C or License D	"derivative works be licensed under the <u>same terms</u> or compatible terms as the original work"
	D	0	1	0	1			
Type III Attribute Restriction	E	0	0	1	1		License E	Use most restrictive license to not to violate any original license
	F	0	0	0	1			

3. Computation of Composite Attributes

OR-composition operator:

$$\rho : \mathcal{A} \times \mathcal{A} \rightarrow \mathcal{A},$$

$$\rho(b, b') = b'' : b''_i = \max(b_i, b'_i), \forall i \in \{1, \dots, n\}$$

	DerivativeWorks	Distribution	Reproduction	Attribution	Notice	ShareAlike	CommercialUse
CC-BY	0	0	0	1	1	0	0
CC-BY-NC	0	0	0	1	1	0	1
$\rho(\text{CC-BY}, \text{CC-BY-NC})$	0	0	0	1	1	0	1

4. Determining Compatible Licenses

Exclusion of less restrictive licenses:

$$\mathcal{L} \notin \mathcal{L}_{out} \text{ if } b_i = 1 \neq b_i^c$$

	DerivativeWorks	Distribution	Reproduction	Attribution	Notice	ShareAlike	CommercialUse	
$\rho(\text{CC-BY}, \text{CC-BY-NC}) = b$	0	0	0	1	1	0	1	
CC-BY = b^1	0	0	0	1	1	0	0	X
CC-BY-NC = b^2	0	0	0	1	1	0	1	✓

Evaluation: CC License Compatibility Chart

	PUBLIC DOMAIN	PUBLIC DOMAIN	CC BY	CC BY SA	CC BY NC	CC BY ND	CC BY NC SA	CC BY NC ND
PUBLIC DOMAIN	✓	✓	✓	✓	✓	✗	✓	✗
PUBLIC DOMAIN	✓	✓	✓	✓	✓	✗	✓	✗
CC BY	✓	✓	✓	✓	✓	✗	✓	✗
CC BY SA	✓	✓	✓	✓	✗	✗	✗	✗
CC BY NC	✓	✓	✓	✗	✓	✗	✓	✗
CC BY ND	✗	✗	✗	✗	✗	✗	✗	✗
CC BY NC SA								
CC BY NC ND								

"Choose **two works** you wish to **combine** or remix. [...]
 Use at least the most restrictive licensing of the two
 (use the license **most to right or down state**) for the new work."
https://wiki.creativecommons.org/index.php?title=Wiki/cc_license_compatibility

Evaluation: Creative Commons License Compatibility Chart

								
	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✗	✗	✗	✗
	✓	✓	✓	✗	✓	✗	✓	✗
	✗	✗	✗	✗	✗	✗	✗	✗
	✓	✓	✓	✗	✓	✗	✓	✗
	✗	✗	✗	✗	✗	✗	✗	✗

	PD	CC0	BY	BY-SA	BY-NC	BY-NC-SA
PD	all	all	BY, BY-NC, BY-NC-ND, BY-NC-SA, BY-ND, BY-SA	BY-SA	BY-NC, BY-NC-ND, BY-NC-SA	BY-NC-SA
CC0	all	all	BY, BY-NC, BY-NC-ND, BY-NC-SA, BY-ND, BY-SA	BY-SA	BY-NC, BY-NC-ND, BY-NC-SA	BY-NC-SA
BY	BY, BY-NC, BY-NC-ND, BY-NC-SA, BY-ND, BY-SA	BY, BY-NC, BY-NC-ND, BY-NC-SA, BY-ND, BY-SA	BY, BY-NC, BY-NC-ND, BY-NC-SA, BY-ND, BY-SA	BY-SA	BY-NC, BY-NC-ND, BY-NC-SA	BY-NC-SA
BY-SA	BY-SA	BY-SA	BY-SA	BY-SA	-	-
BY-NC	BY-NC, BY-NC-ND, BY-NC-SA	BY-NC, BY-NC-ND, BY-NC-SA	BY-NC, BY-NC-ND, BY-NC-SA	-	BY-NC, BY-NC-ND, BY-NC-SA	BY-NC-SA
BY-NC-SA	BY-NC-SA	BY-NC-SA	BY-NC-SA	-	BY-NC-SA	BY-NC-SA

Evaluation

612 Creative Commons licenses

187,578 license pairs ($n = 612, k = 2$)

38,390,964 license triples ($n = 612, k = 3$)

$$\frac{(k+n-1)!}{k!(n-1)!}$$

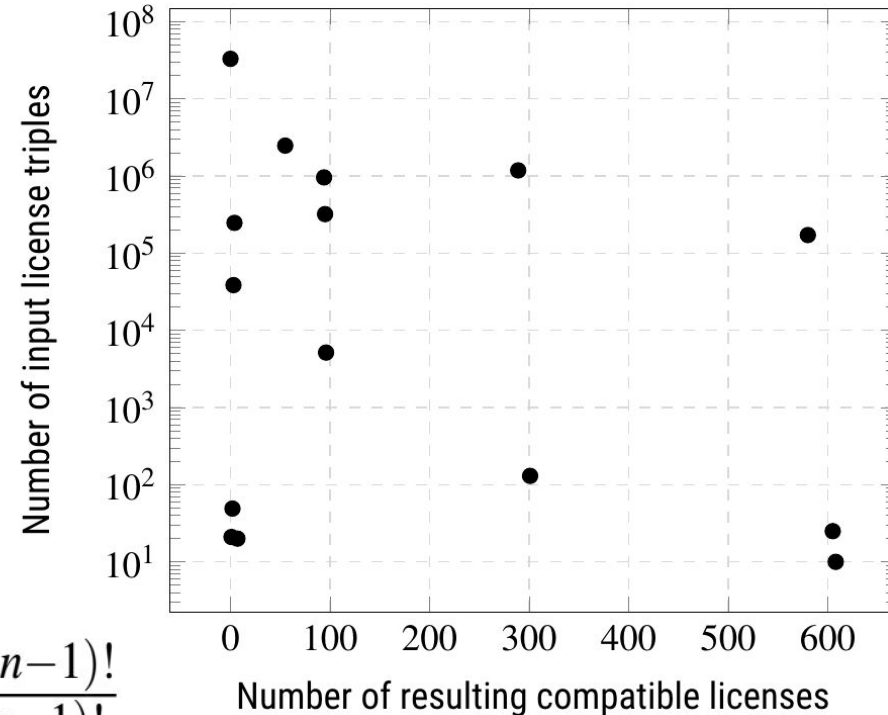
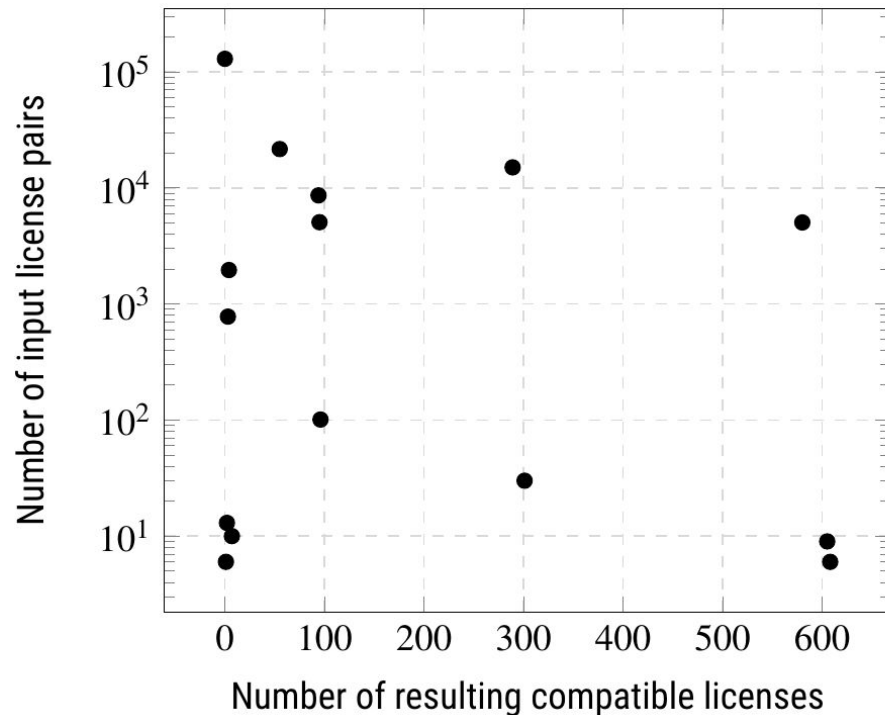
Evaluation

612 Creative Commons licenses

Localized to languages & versions & 7 attributes → 15 data points

187,578 license pairs ($n = 612, k = 2$)

38,390,964 license triples ($n = 612, k = 3$)



$$\frac{(k+n-1)!}{k!(n-1)!}$$

Demo

- ▶ Application
- ▶ 3 Knowledge Graphs
 - CC Chart:
8 Licenses /
7 Attributes
 - EDP: 31 Lic. / 12 Att.
 - CC: 612 Lic. / 10 Att.
- ▶ Webservices
 - Select Knowledge Graph
 - Select licenses
 - Get compatible licenses

ReCoDa Introduction Get Compatible Licenses Webservices About

Relicensing Combined Datasets (ReCoDa)

License	License Attributes						
<input checked="" type="checkbox"/> CC BY 4.0	Distribution	Reproduction	DerivativeWorks	CommercialUse	Attribution	Notice	ShareAlike
<input checked="" type="checkbox"/> CC BY-NC 4.0	Distribution	Reproduction	DerivativeWorks	CommercialUse	Attribution	Notice	ShareAlike
<input type="checkbox"/> CC BY-NC-ND 4.0	Distribution	Reproduction	DerivativeWorks	CommercialUse	Attribution	Notice	ShareAlike
<input type="checkbox"/> CC BY-NC-SA 4.0	Distribution	Reproduction	DerivativeWorks	CommercialUse	Attribution	Notice	ShareAlike
<input type="checkbox"/> CC BY-ND 4.0	Distribution	Reproduction	DerivativeWorks	CommercialUse	Attribution	Notice	ShareAlike
<input type="checkbox"/> CC BY-SA 4.0	Distribution	Reproduction	DerivativeWorks	CommercialUse	Attribution	Notice	ShareAlike
<input checked="" type="checkbox"/> CC0	Distribution	Reproduction	DerivativeWorks	CommercialUse	Attribution	Notice	ShareAlike
<input type="checkbox"/> MARK	Distribution	Reproduction	DerivativeWorks	CommercialUse	Attribution	Notice	ShareAlike

Get compatible licenses

Thank you for your attention!

Resources:

- ▶ <https://github.com/dice-group/ReCoDa>
 - Code
 - Knowledge Graphs

- ▶ <https://dice-research.org/>
 - Demo
 - Research Group