

# Overview in General

This file contains a general overview of the data in the graph including node labels and relationships types.

## References

- [jqassistant](#)
- [Neo4j Python Driver](#)

## Node Labels

### Table 1a - Highest node count by label combination

Lists the 30 label combinations with the highest number of nodes. The labels with the lowest node count are listed in table 1b. The total list would sum up to the total number of labels (100%).

The whole table can be found in the CSV report `Node_label_combination_count`.

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	245299	73.476473
1	[Java, ByteCode, Method, Member]	13204	3.955105
2	[Java, ByteCode, Parameter]	13000	3.893999
3	[Git, Commit]	11996	3.593263
4	[File, Git]	10671	3.196374
5	[Java, ByteCode, Bound, ParameterizedType]	7166	2.146492
6	[Java, ByteCode, Bound]	7112	2.130317
7	[Java, ByteCode, Member, Field]	3494	1.046587
8	[Java, ByteCode, Bound, WildcardType]	2906	0.870459
9	[Java, Value, ByteCode, Annotation]	2821	0.844998
10	[Xml, Element]	2144	0.642210
11	[Java, ByteCode, Constructor, Method, Member]	2040	0.611058
12	[Xml, Text]	1436	0.430137
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.328294
14	[Java, ByteCode, Method, Member, Lambda]	936	0.280368
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	900	0.269585
16	[Type, File, Java, ByteCode, Class]	861	0.257903
17	[Type, File, Java, ByteCode, JavaType]	746	0.223456
18	[Java, Value, ByteCode, Primitive]	650	0.194700
19	[Java, ByteCode, Method, Member, GenericDeclar...	569	0.170437
20	[Json, Key]	555	0.166244
21	[Value, Json, Scalar]	539	0.161451
22	[Type, File, Java, ByteCode, ExternalType]	396	0.118617
23	[Author, Git, Person]	292	0.087465
24	[Value, Array]	267	0.079977
25	[Committer, Git, Person]	247	0.073986
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.070691
27	[Value, Property]	202	0.060507
28	[Type, File, Java, ByteCode, Interface]	187	0.056014
29	[Java, Value, ByteCode, Class]	172	0.051521

## Chart 1a - Highest node count by label combination

Values under 0.5% will be grouped into "others" to get a cleaner plot. The group "others" is then broken down in Chart 1b.

<Figure size 640x480 with 0 Axes>

Nodes per label combination (more than 0.5% overall)

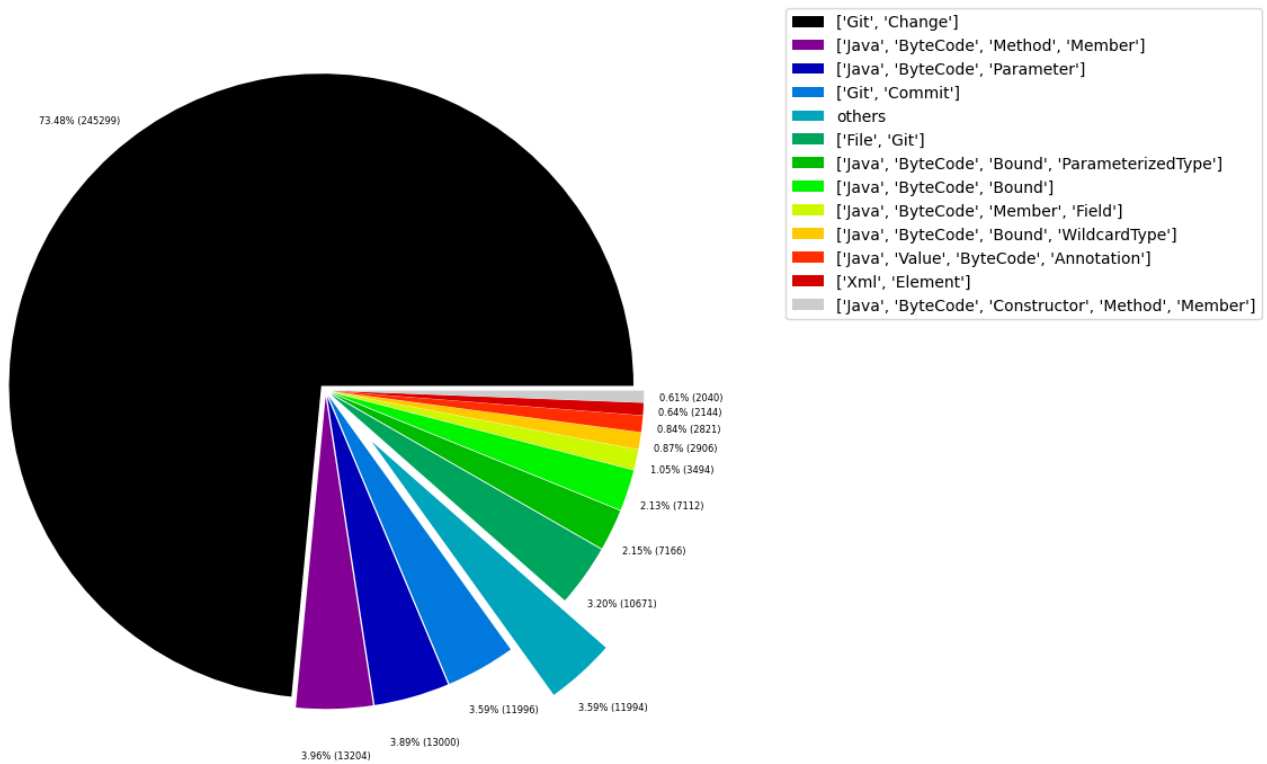


Table 1b - Lowest node count by label combination

Lists the 30 label combinations with the lowest number of nodes until they reach 0.5% of the total node count, which are shown above.

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Analyze, Task, jQAssistant]	1	0.000300
1	[File, Json]	2	0.000599
2	[File]	3	0.000899
3	[Java, ByteCode, Constructor, Method, Member, ...]	4	0.001198
4	[Maven, Exclusion]	5	0.001498
5	[Value, Array, Json]	6	0.001797
6	[File, Xml, Maven, Pom, Document]	9	0.002696
7	[Type, File, Java, ByteCode, Void]	9	0.002696
8	[Java, ManifestSection]	9	0.002696
9	[File, Java, Manifest]	9	0.002696
10	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002696
11	[File, Java, ServiceLoader]	10	0.002995
12	[File, Java, Properties]	12	0.003594
13	[Maven, ExecutionGoal]	16	0.004793
14	[Maven, PluginExecution]	16	0.004793
15	[Xml, Attribute]	18	0.005392
16	[jQAssistant, Rule, Concept]	19	0.005691
17	[Maven, Plugin]	21	0.006290
18	[Maven, Configuration]	21	0.006290
19	[Type, File, Java, ByteCode, Enum]	28	0.008387
20	[Git, Branch]	29	0.008687
21	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008687
22	[Xml, Namespace]	36	0.010783
23	[Type, File, Java, ByteCode, Annotation]	43	0.012880
24	[File, Directory]	44	0.013180
25	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.025461
26	[Artifact, Maven]	92	0.027558
27	[Type, File, Java, ByteCode, ExternalType, Ext...	93	0.027857
28	[Value, ManifestEntry]	120	0.035945
29	[Value, Json, Object]	132	0.039539

## Chart 1b - Lowest node count by label combination

Shows the lowest (less than 0.5% overall) node count label combinations. Therefore, this plot breaks down the "others" slice of the pie chart above. Values under 0.01% will be grouped into "others" to get a cleaner plot.

<Figure size 640x480 with 0 Axes>

Nodes per label combination (less than 0.5% overall)

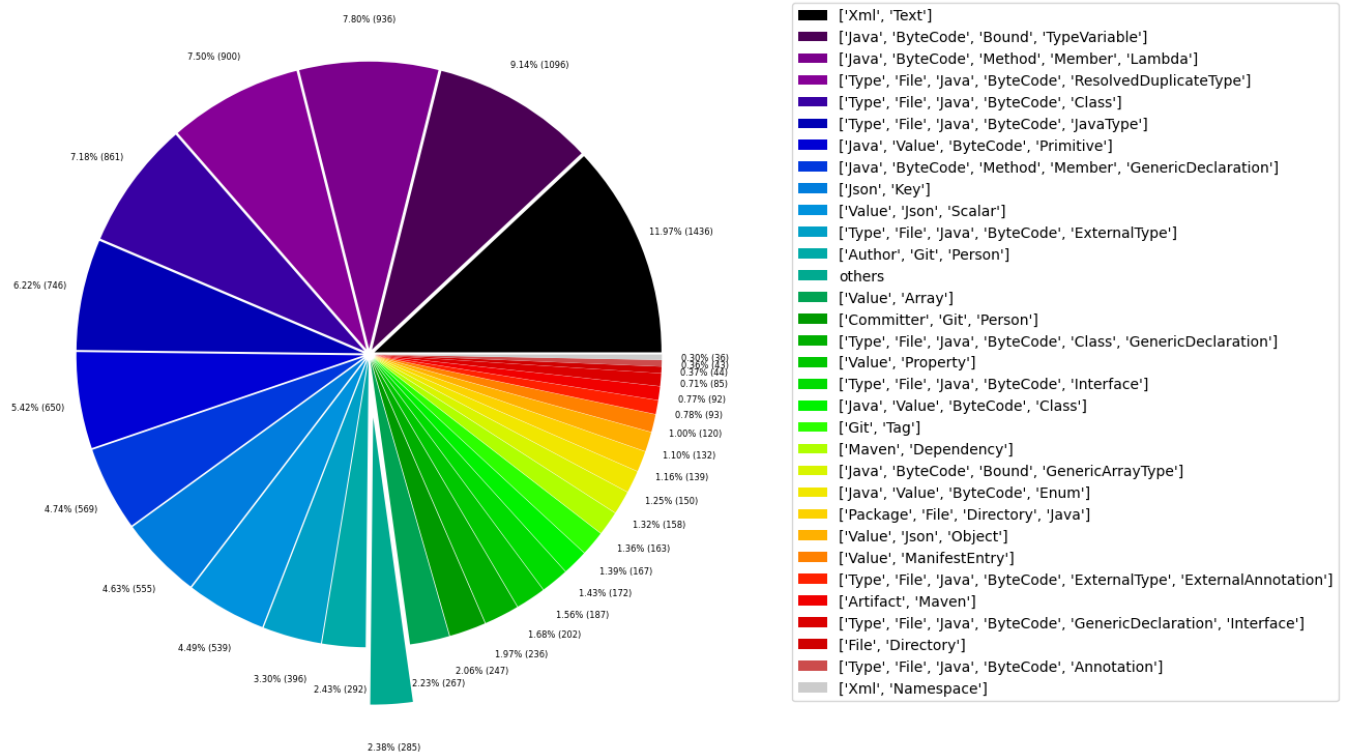


Table 1c - Highest node count by single label

Lists the 40 labels with the highest number of nodes. Doesn't sum up to the total number of nodes or 100% because one node can have multiple labels. Helps to identify commonly used labels.

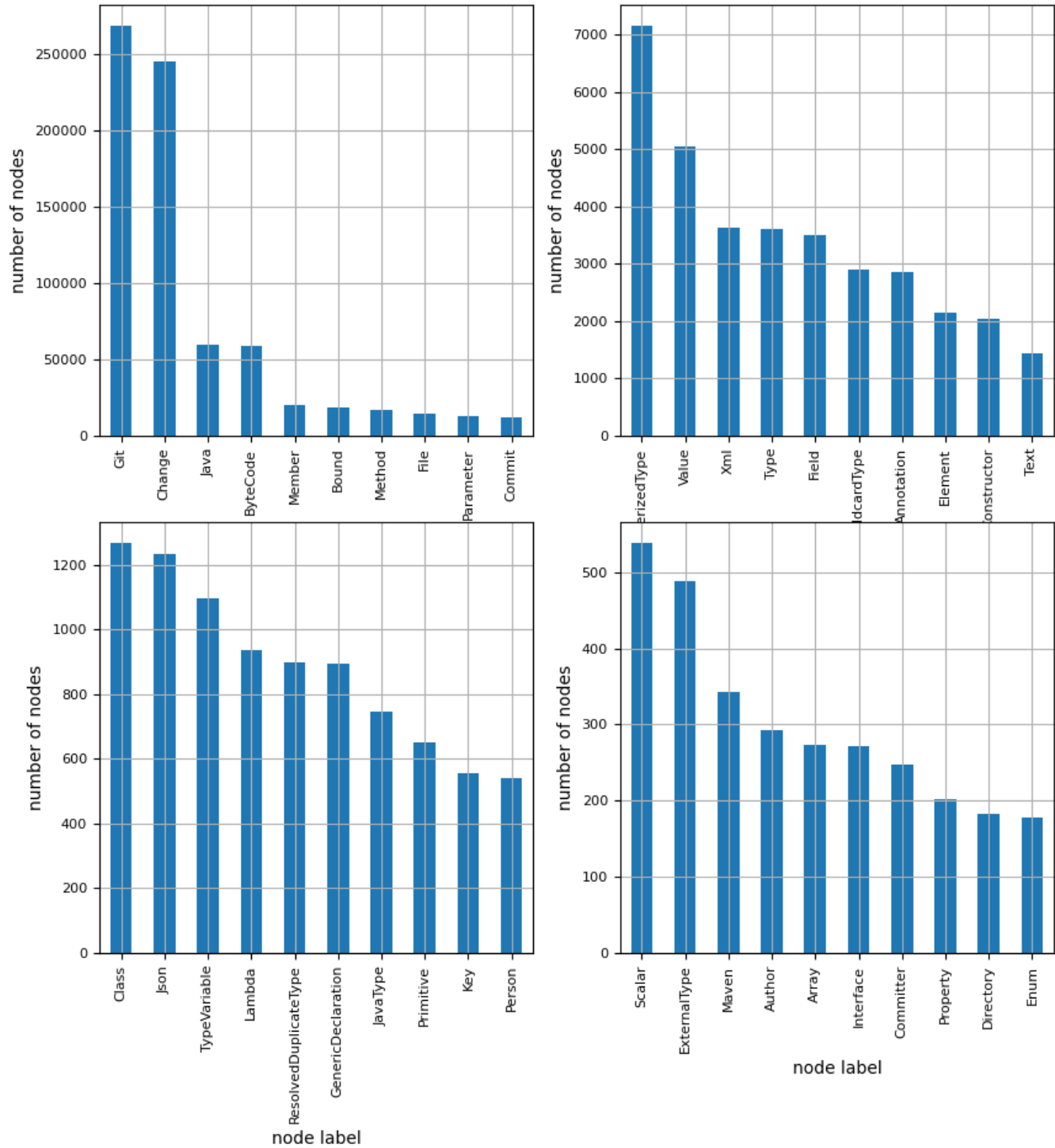
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	268701	80.486271
1	Change	245299	73.476473
2	Java	59279	17.756337
3	ByteCode	59091	17.700024
4	Member	20247	6.064754
5	Bound	18438	5.522889
6	Method	16753	5.018167
7	File	14521	4.349597
8	Parameter	13000	3.893999
9	Commit	11996	3.593263
10	ParameterizedType	7166	2.146492
11	Value	5059	1.515365
12	Xml	3643	1.091218
13	Type	3613	1.082232
14	Field	3494	1.046587
15	WildcardType	2906	0.870459
16	Annotation	2864	0.857878
17	Element	2144	0.642210
18	Constructor	2044	0.612257
19	Text	1436	0.430137
20	Class	1269	0.380114
21	Json	1234	0.369630
22	TypeVariable	1096	0.328294
23	Lambda	936	0.280368
24	ResolvedDuplicateType	900	0.269585
25	GenericDeclaration	894	0.267787
26	JavaType	746	0.223456
27	Primitive	650	0.194700
28	Key	555	0.166244
29	Person	539	0.161451
30	Scalar	539	0.161451
31	ExternalType	489	0.146474
32	Maven	343	0.102742
33	Author	292	0.087465
34	Array	273	0.081774
35	Interface	272	0.081474
36	Committer	247	0.073986
37	Property	202	0.060507
38	Directory	183	0.054816
39	Enum	178	0.053318

## Chart 1c - Highest node count by label

Shows the 40 labels with the highest number of nodes.

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## Node count by label



## Relationship Types

Table 2a - Highest relationship count by type

Lists the 30 relationship types with the highest number of occurrences. The whole table can be found in the CSV report `Relationship_type_count`.

Total number of relationships: 1012256

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	245299	24.232902
1	MODIFIES	245299	24.232902
2	UPDATES	158722	15.680026
3	CREATES	59675	5.895248
4	DELETES	37191	3.674071
5	INVOKES	35576	3.514526
6	COMMITTED	23992	2.370151
7	DEPENDS_ON	21873	2.160817
8	OF_TYPE	21347	2.108854
9	DECLARES	20688	2.043752
10	OF_RAW_TYPE	17077	1.687024
11	HAS_PARENT	14588	1.441137
12	HAS	14094	1.392336
13	RETURNS	12547	1.239509
14	RENAMES	10289	1.016442
15	READS	9076	0.896611
16	HAS_ACTUAL_TYPE_ARGUMENT	8276	0.817580
17	HAS_NEW_NAME	6198	0.612296
18	OF_GENERIC_TYPE	5902	0.583054
19	RESOLVES_TO	5226	0.516273
20	SIMILAR	3968	0.391996
21	CONTAINS	3805	0.375893
22	WRITES	3803	0.375695
23	RETURNS_GENERIC	3543	0.350010
24	ANNOTATED_BY	2809	0.277499
25	REQUIRES	2173	0.214669
26	HAS_FIRST_CHILD	2144	0.211804
27	HAS_LAST_CHILD	2144	0.211804
28	HAS_ELEMENT	2126	0.210026
29	HAS_UPPER_BOUND	1521	0.150258

## Chart 2a - Highest relationship count by type

Values under 0.5% will be grouped into "others" to get a cleaner plot. The group "others" is then broken down in the second chart.

<Figure size 640x480 with 0 Axes>



Relationship types (more than 0.5% overall)

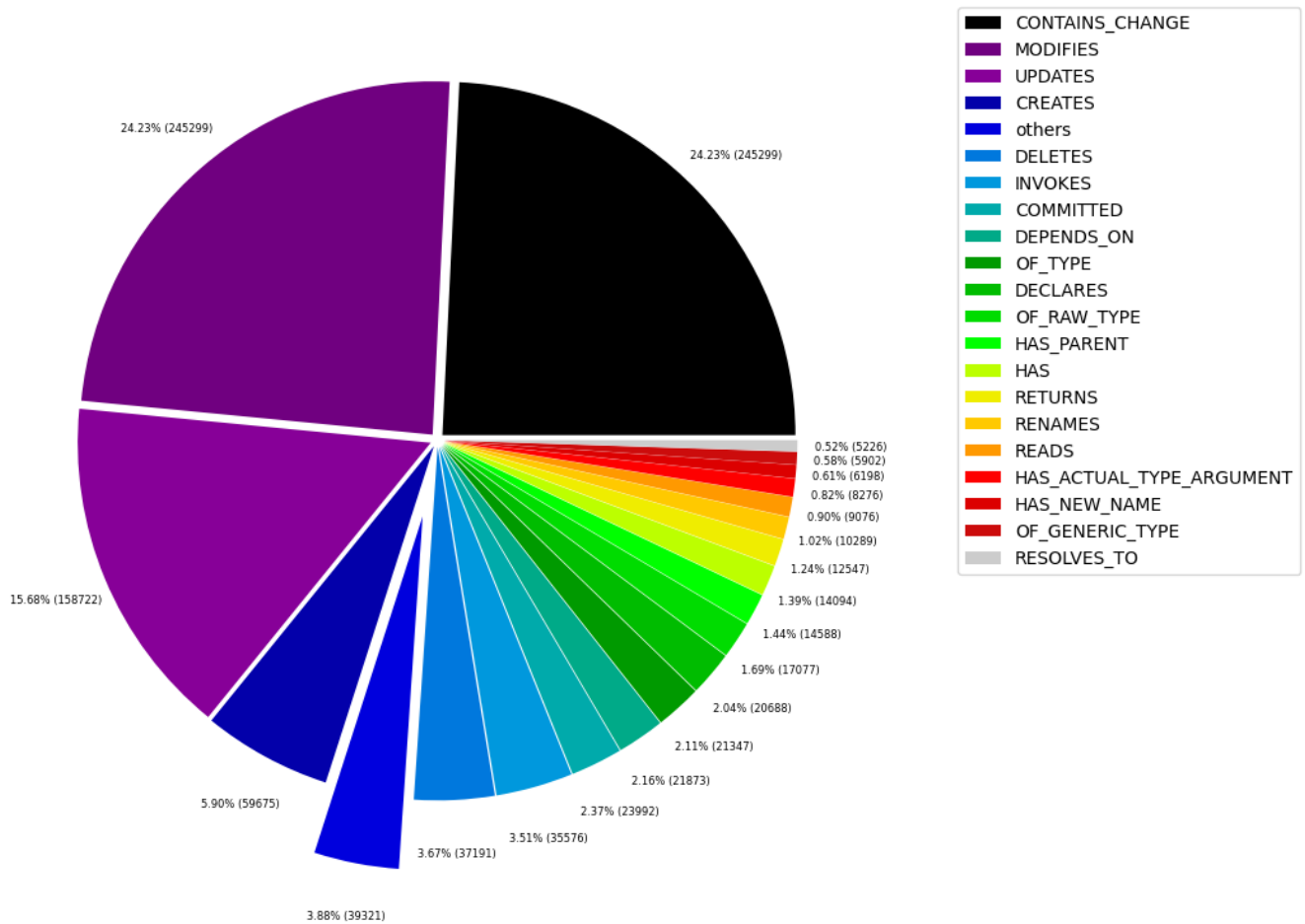


Table 2b - Lowest relationship count by type

Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

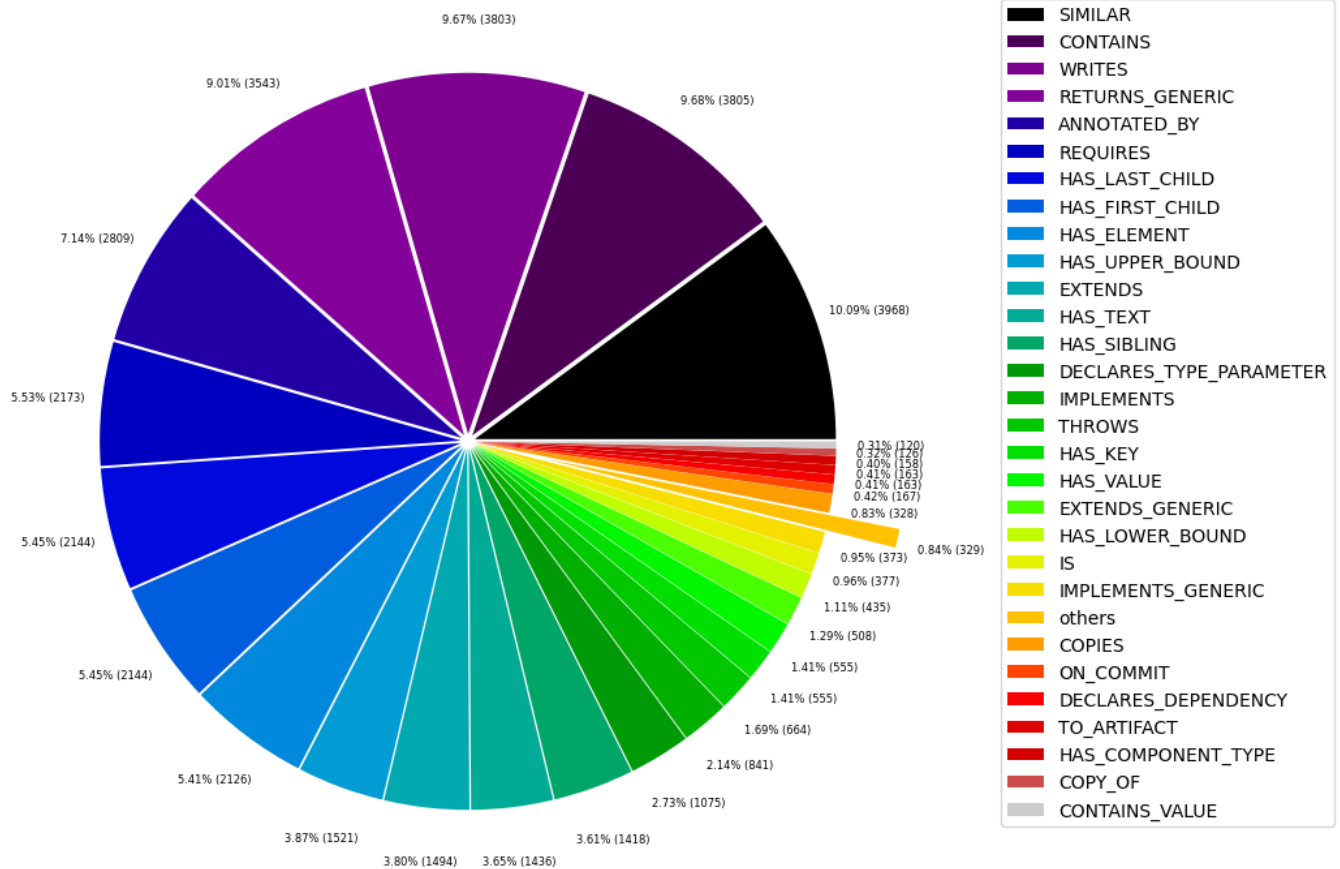
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000099
1	THROWS_GENERIC	5	0.000494
2	EXCLUDES	5	0.000494
3	HAS_ROOT_ELEMENT	9	0.000889
4	DESCRIBES	9	0.000889
5	HAS_GOAL	16	0.001581
6	HAS_EXECUTION	16	0.001581
7	OF_NAMESPACE	18	0.001778
8	HAS_ATTRIBUTE	18	0.001778
9	INCLUDES_CONCEPT	19	0.001877
10	USES_PLUGIN	21	0.002075
11	REQUIRES_TYPE_PARAMETER	21	0.002075
12	IS_ARTIFACT	21	0.002075
13	HAS_CONFIGURATION	21	0.002075
14	REQUIRES_CONCEPT	28	0.002766
15	HAS_HEAD	29	0.002865
16	DECLARES_NAMESPACE	36	0.003556
17	HAS_DEFAULT	36	0.003556
18	CONTAINS_VALUE	120	0.011855
19	COPY_OF	126	0.012447
20	HAS_COMPONENT_TYPE	158	0.015609
21	TO_ARTIFACT	163	0.016103
22	DECLARES_DEPENDENCY	163	0.016103
23	ON_COMMIT	167	0.016498
24	COPIES	328	0.032403
25	IMPLEMENTS_GENERIC	373	0.036848
26	IS	377	0.037244
27	HAS_LOWER_BOUND	435	0.042973
28	EXTENDS_GENERIC	508	0.050185
29	HAS_VALUE	555	0.054828

## Chart 2b - Lowest relationship count by type

Shows the lowest (less than 0.5% overall) relationship types. This plot breaks down the "others" slice of the pie chart above. Values under 0.01% will be grouped into "others" to get a cleaner plot.

<Figure size 640x480 with 0 Axes>

Relationship types (less than 0.5% overall)



## Node labels with their relationships

Table 3a - Highest relationship count by node labels and relationship type

Lists the 30 node labels and their relationship types with the highest number of occurrences.

	sourceLabels	relationType	targetLabels	numberOfRelationships	numberOfNodesWithSameLabelsAsSource	numberOfNodesWithS
0	[Git, Commit]	CONTAINS_CHANGE	[Git, Change]	245299		11996
1	[Git, Change]	MODIFIES	[File, Git]	245299		245299
2	[Git, Change]	UPDATES	[File, Git]	158722		245299
3	[Git, Change]	CREATES	[File, Git]	59675		245299
4	[Git, Change]	DELETES	[File, Git]	37191		245299
5	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	21523		13080
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14579		11996
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11996		292
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11996		247
9	[Git, Change]	RENAMES	[File, Git]	10289		245299
10	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	8297		13080
11	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	8100		13080
12	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6360		13000
13	[File, Git]	HAS_NEW_NAME	[File, Git]	6198		10671
14	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3569		7112
15	[Java, ByteCode, Bound, ParameterizedType]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3043		7166
16	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2906		7166
17	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound, ParameterizedType]	2655		13000
18	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2454		7166
19	[Java, ByteCode, Constructor, Method, Member]	WRITES	[Java, ByteCode, Member, Field]	2426		2040
20	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalType, Ext...	2340		2821
21	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126		2144
22	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2111		2040
23	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2088		13080
24	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	2023		2040
25	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2023		13000
26	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2007		13080
27	[Java, ByteCode, Method, Member, Lambda]	INVOKES	[Java, ByteCode, Method, Member]	1883		936
28	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound]	1802		7166
29	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	1796		2040

## Graph Density

```
total_number_of_nodes (vertices): 333847
total_number_of_relationships (edges): 1012256
-> total directed graph density: 9.082318017204552e-06
-> total directed graph density in percent: 0.0009082318017204552
```