

# 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`.

Total number of nodes: 307227

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	231081	75.215069
1	[Git, Commit]	11637	3.787753
2	[Java, ByteCode, Parameter]	11202	3.646164
3	[Java, ByteCode, Method, Member]	10655	3.468120
4	[File, Git]	10547	3.432967
5	[Java, ByteCode, Bound, ParameterizedType]	6542	2.129370
6	[Java, ByteCode, Bound]	6316	2.055809
7	[Java, ByteCode, Member, Field]	2848	0.927002
8	[Java, ByteCode, Bound, WildcardType]	2723	0.886315
9	[Java, Value, ByteCode, Annotation]	2225	0.724220
10	[Java, ByteCode, Constructor, Method, Member]	1648	0.536411
11	[Xml, Element]	1534	0.499305
12	[Xml, Text]	1016	0.330700
13	[Java, ByteCode, Bound, TypeVariable]	989	0.321912
14	[Java, ByteCode, Method, Member, Lambda]	769	0.250304
15	[Type, File, Java, ByteCode, Class]	699	0.227519
16	[Type, File, Java, ByteCode, JavaType]	597	0.194319
17	[Type, File, Java, ByteCode, ResolvedDuplicate...	542	0.176417
18	[Java, ByteCode, Method, Member, GenericDeclar...	525	0.170883
19	[Java, Value, ByteCode, Primitive]	467	0.152005
20	[Author, Git, Person]	288	0.093742
21	[Committer, Git, Person]	242	0.078769
22	[Type, File, Java, ByteCode, Class, GenericDec...	215	0.069981
23	[Type, File, Java, ByteCode, ExternalType]	194	0.063145
24	[Type, File, Java, ByteCode, Interface]	167	0.054357
25	[Git, Tag]	165	0.053706
26	[Java, ByteCode, Bound, GenericArrayType]	145	0.047196
27	[Java, Value, ByteCode, Enum]	142	0.046220
28	[Maven, Dependency]	116	0.037757
29	[Value, Property]	109	0.035479

## 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)

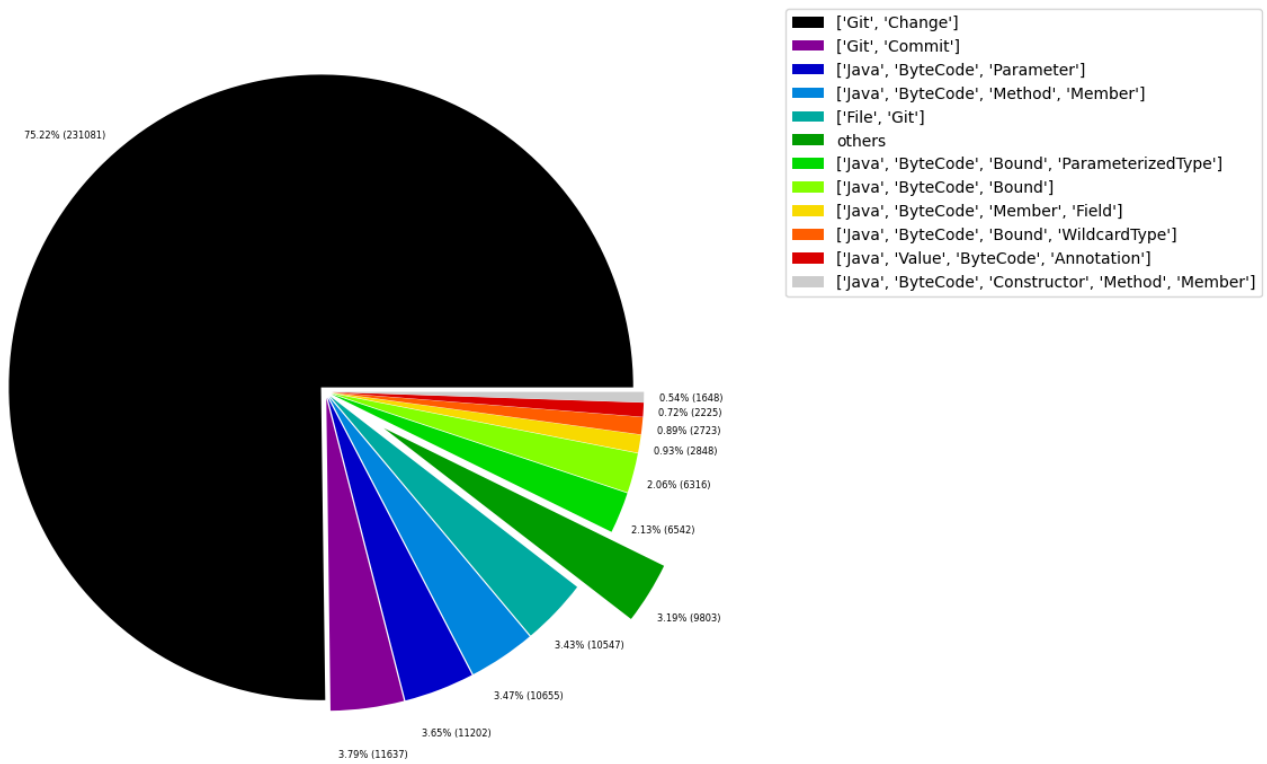


Table 1b - Lowest node count by label combination

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	0.000325
1	[Maven, Exclusion]	1	0.000325
2	[Repository, File, Git]	1	0.000325
3	[File, TS, Scan]	1	0.000325
4	[Java, ByteCode, Constructor, Method, Member, ...]	3	0.000976
5	[File, Xml, Maven, Pom, Document]	6	0.001953
6	[Type, File, Java, ByteCode, Void]	6	0.001953
7	[Java, ManifestSection]	6	0.001953
8	[File, Java, Manifest]	6	0.001953
9	[Artifact, File, Jar, Archive, Zip, Java]	6	0.001953
10	[File, Java, Properties]	8	0.002604
11	[File, Java, ServiceLoader]	9	0.002929
12	[Xml, Attribute]	12	0.003906
13	[Maven, ExecutionGoal]	14	0.004557
14	[Maven, PluginExecution]	14	0.004557
15	[Maven, Plugin]	16	0.005208
16	[Maven, Configuration]	16	0.005208
17	[jQAssistant, Rule, Concept]	19	0.006184
18	[File]	21	0.006835
19	[Type, File, Java, ByteCode, PrimitiveType]	21	0.006835
20	[Git, Branch]	23	0.007486
21	[Xml, Namespace]	24	0.007812
22	[Type, File, Java, ByteCode, Enum]	25	0.008137
23	[Java, Value, ByteCode, Class]	28	0.009114
24	[File, Directory]	39	0.012694
25	[Type, File, Java, ByteCode, Annotation]	40	0.013020
26	[Type, File, Java, ByteCode, ExternalType, Ext...]	65	0.021157
27	[Artifact, Maven]	69	0.022459
28	[Type, File, Java, ByteCode, GenericDeclaratio...]	80	0.026039
29	[Value, ManifestEntry]	91	0.029620

## 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)

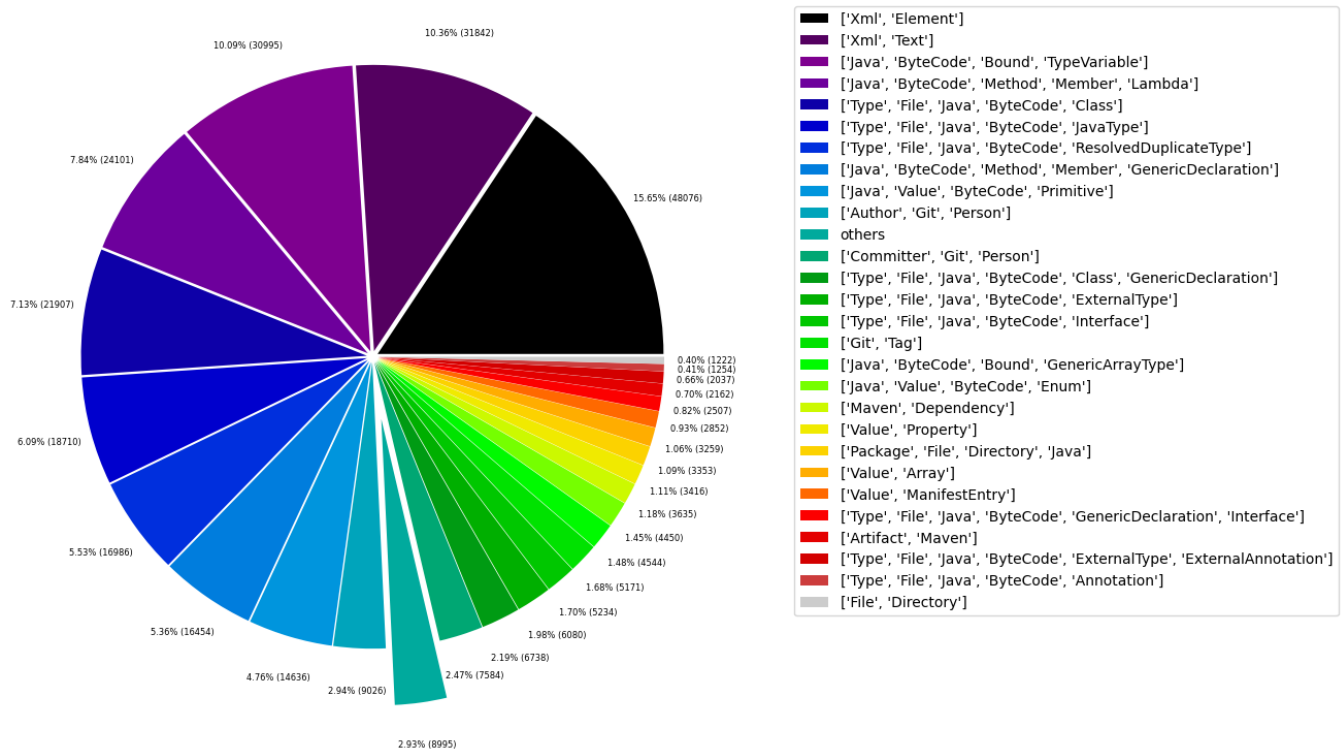


Table 1c - Highest node count by single label

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.

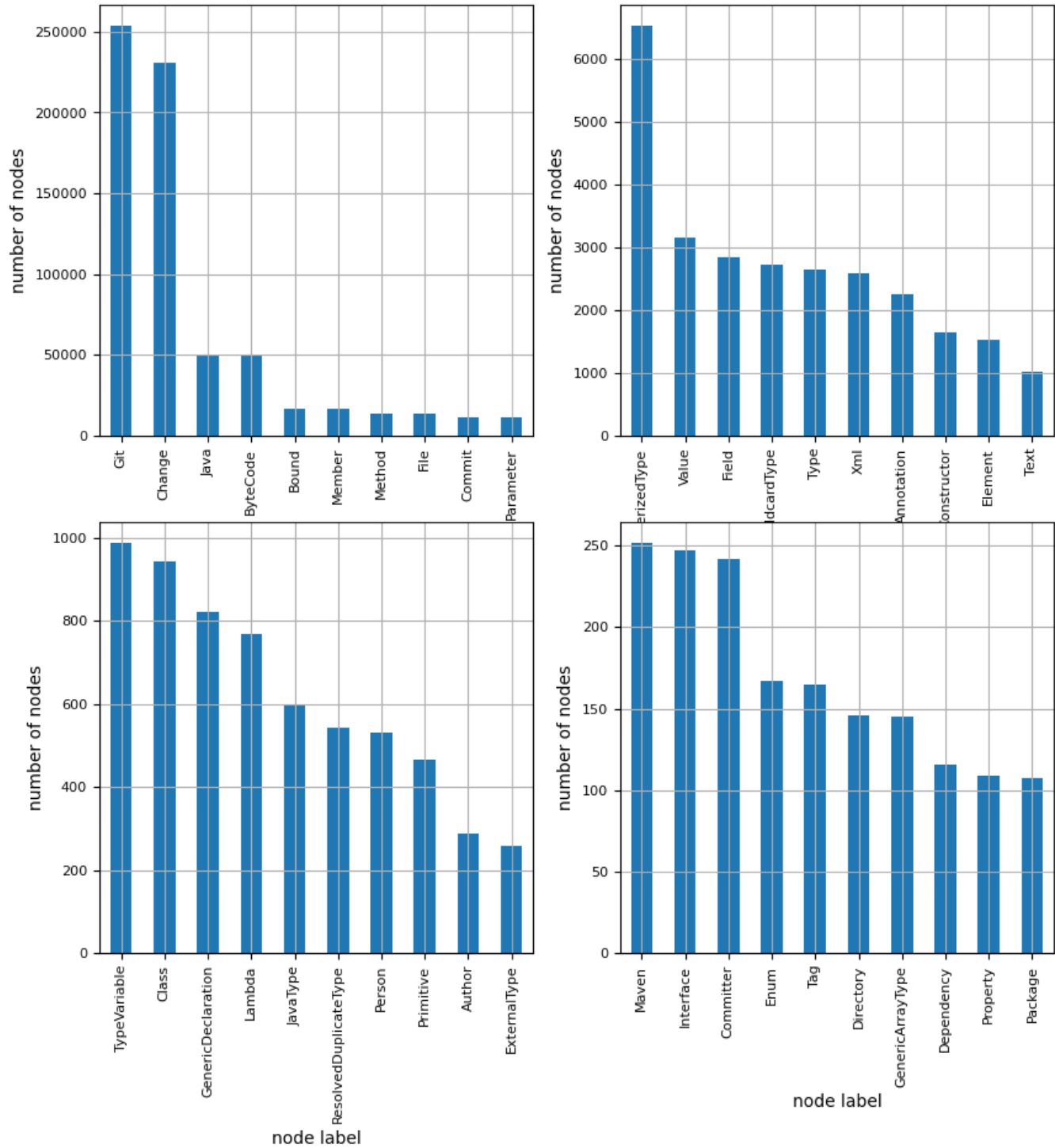
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	253984	82.669817
1	Change	231081	75.215069
2	Java	50020	16.281121
3	ByteCode	49878	16.234901
4	Bound	16715	5.440603
5	Member	16448	5.353696
6	Method	13600	4.426694
7	File	13402	4.362247
8	Commit	11637	3.787753
9	Parameter	11202	3.646164
10	ParameterizedType	6542	2.129370
11	Value	3166	1.030508
12	Field	2848	0.927002
13	WildcardType	2723	0.886315
14	Type	2651	0.862880
15	Xml	2592	0.843676
16	Annotation	2265	0.737240
17	Constructor	1651	0.537388
18	Element	1534	0.499305
19	Text	1016	0.330700
20	TypeVariable	989	0.321912
21	Class	942	0.306614
22	GenericDeclaration	823	0.267880
23	Lambda	769	0.250304
24	JavaType	597	0.194319
25	ResolvedDuplicateType	542	0.176417
26	Person	530	0.172511
27	Primitive	467	0.152005
28	Author	288	0.093742
29	ExternalType	259	0.084302
30	Maven	252	0.082024
31	Interface	247	0.080397
32	Committer	242	0.078769
33	Enum	167	0.054357
34	Tag	165	0.053706
35	Directory	146	0.047522
36	GenericArrayType	145	0.047196
37	Dependency	116	0.037757
38	Property	109	0.035479
39	Package	107	0.034828

## Chart 1c - Highest node count by label

Shows the 40 labels with the highest number of nodes.

<Figure size 640x480 with 0 Axes>

## 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: 953778

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	231081	24.227965
1	MODIFIES	231081	24.227965
2	UPDATES	148057	15.523214
3	CREATES	57541	6.032955
4	DELETES	35338	3.705055
5	INVOKES	29713	3.115295
6	COMMITTED	23274	2.440190
7	OF_TYPE	17636	1.849068
8	DEPENDS_ON	17445	1.829042
9	DECLARES	16810	1.762465
10	OF_RAW_TYPE	15200	1.593662
11	HAS_PARENT	14145	1.483050
12	HAS	11902	1.247879
13	HAS_COMMIT	11637	1.220095
14	RETURNS	10643	1.115878
15	HAS_FILE	10547	1.105813
16	RENAMES	9855	1.033259
17	READS	7695	0.806792
18	HAS_ACTUAL_TYPE_ARGUMENT	7501	0.786451
19	HAS_NEW_NAME	6159	0.645748
20	OF_GENERIC_TYPE	5349	0.560822
21	RESOLVES_TO	3790	0.397367
22	SIMILAR	3419	0.358469
23	RETURNS_GENERIC	3253	0.341065
24	CONTAINS	3084	0.323346
25	WRITES	3066	0.321458
26	ANNOTATED_BY	2213	0.232025
27	HAS_FIRST_CHILD	1534	0.160834
28	HAS_LAST_CHILD	1534	0.160834
29	HAS_ELEMENT	1522	0.159576

## 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)

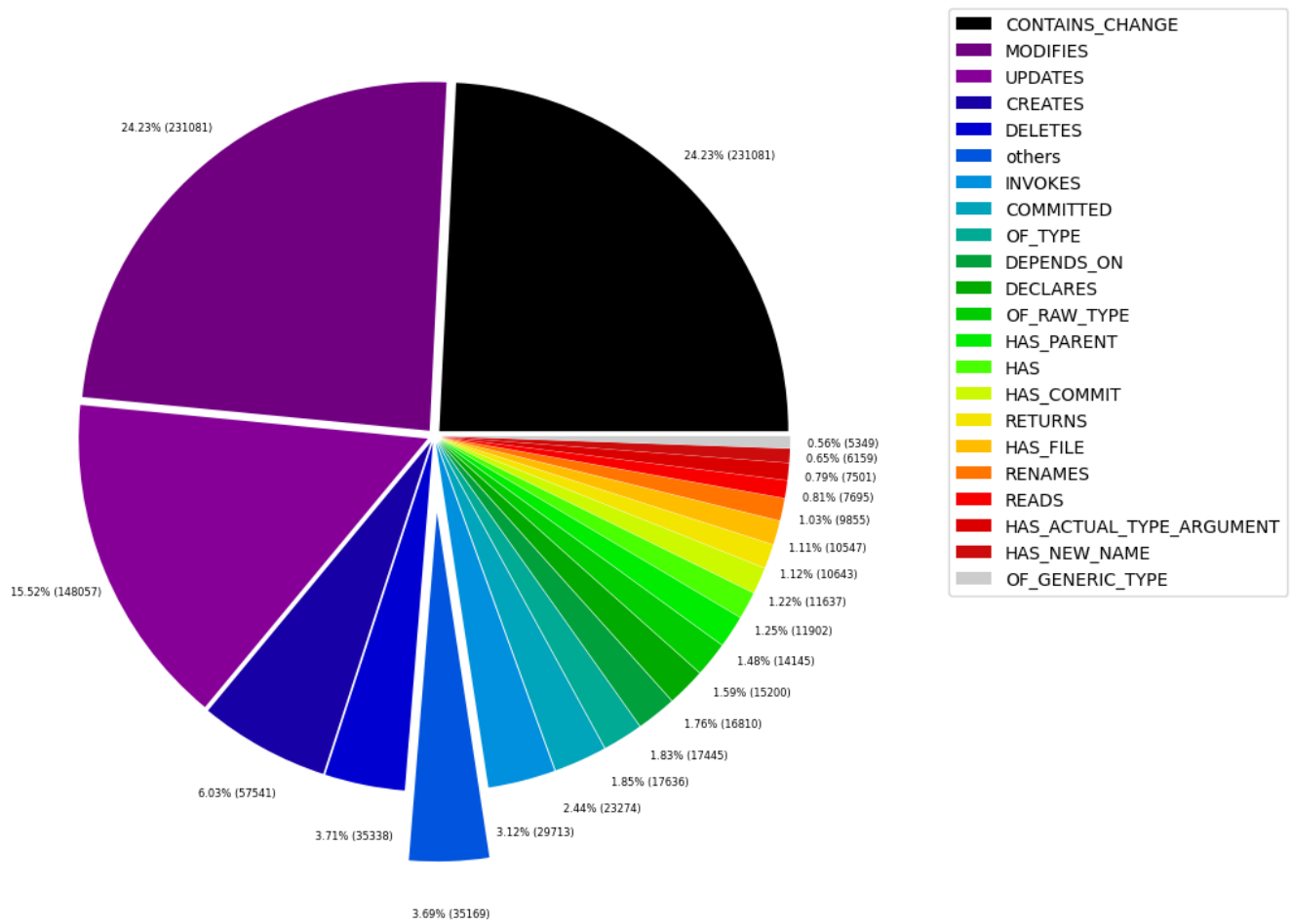


Table 2b - Lowest relationship count by type

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.

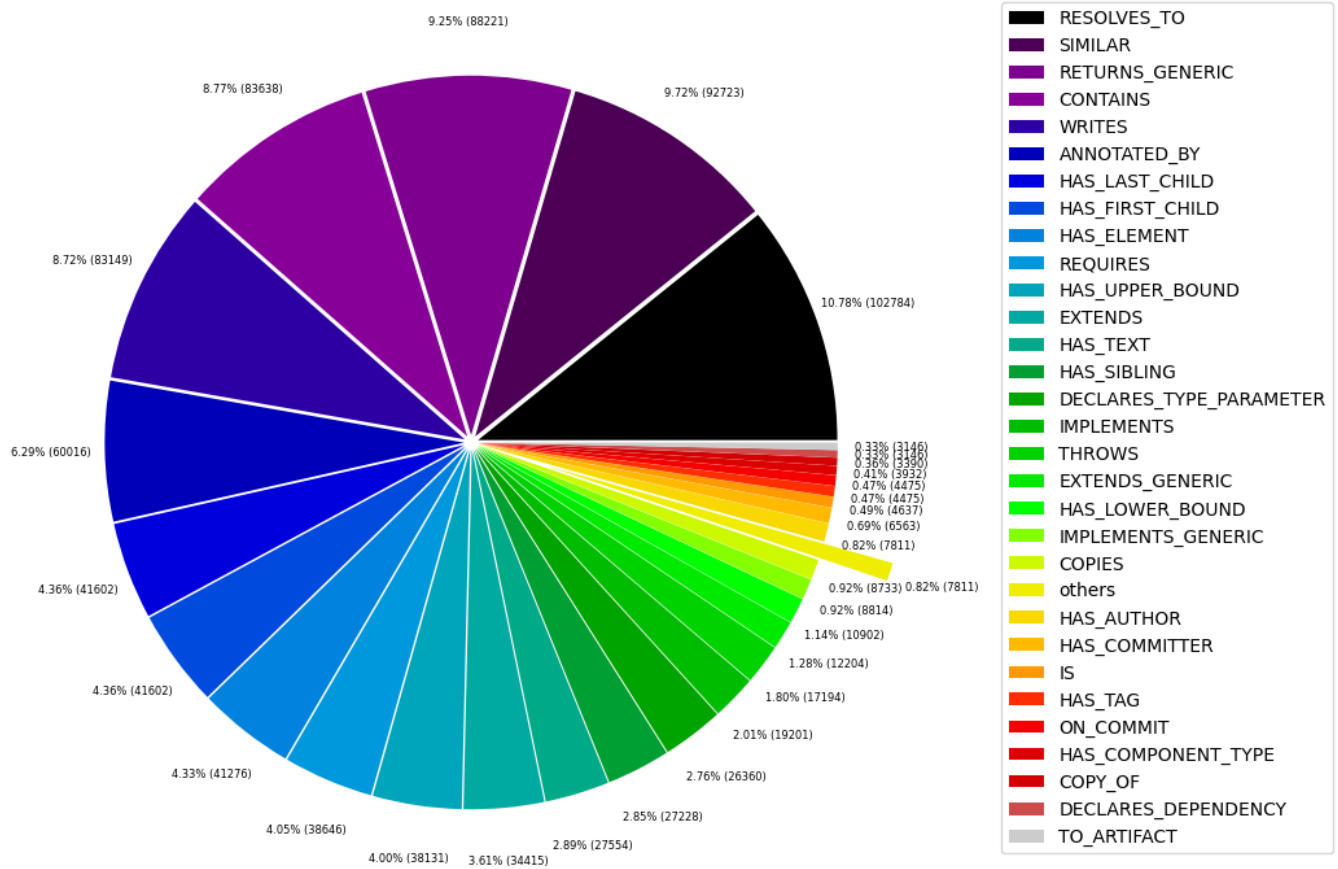
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	EXCLUDES	1	0.000105
1	THROWS_GENERIC	5	0.000524
2	DESCRIBES	6	0.000629
3	HAS_ROOT_ELEMENT	7	0.000734
4	OF_NAMESPACE	12	0.001258
5	HAS_ATTRIBUTE	12	0.001258
6	HAS_GOAL	14	0.001468
7	HAS_EXECUTION	14	0.001468
8	USES_PLUGIN	16	0.001678
9	IS_ARTIFACT	16	0.001678
10	HAS_CONFIGURATION	16	0.001678
11	REQUIRES_TYPE_PARAMETER	17	0.001782
12	INCLUDES_CONCEPT	19	0.001992
13	HAS_BRANCH	23	0.002411
14	HAS_HEAD	24	0.002516
15	DECLARES_NAMESPACE	24	0.002516
16	REQUIRES_CONCEPT	28	0.002936
17	HAS_DEFAULT	34	0.003565
18	DECLARES_DEPENDENCY	116	0.012162
19	TO_ARTIFACT	116	0.012162
20	COPY_OF	125	0.013106
21	HAS_COMPONENT_TYPE	145	0.015203
22	ON_COMMIT	165	0.017300
23	HAS_TAG	165	0.017300
24	IS	171	0.017929
25	HAS_COMMITTER	242	0.025373
26	HAS_AUTHOR	288	0.030196
27	COPIES	322	0.033760
28	IMPLEMENTS_GENERIC	325	0.034075
29	HAS_LOWER_BOUND	402	0.042148

## 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]	231081	11637	
1	[Git, Change]	MODIFIES	[File, Git]	231081	231081	
2	[Git, Change]	UPDATES	[File, Git]	148057	231081	
3	[Git, Change]	CREATES	[File, Git]	57541	231081	
4	[Git, Change]	DELETES	[File, Git]	35338	231081	
5	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	18196	10568	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14139	11637	
7	[Repository, File, Git]	HAS_COMMIT	[Git, Commit]	11637	1	
8	[Author, Git, Person]	COMMITTED	[Git, Commit]	11637	288	
9	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11637	242	
10	[Repository, File, Git]	HAS_FILE	[File, Git]	10547	1	
11	[Git, Change]	RENAMES	[File, Git]	9855	231081	
12	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	7306	10568	
13	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	6917	10568	
14	[File, Git]	HAS_NEW_NAME	[File, Git]	6159	10547	
15	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	5730	11202	
16	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3218	6316	
17	[Java, ByteCode, Bound, ParameterizedType]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	2779	6542	
18	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2723	6542	
19	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound, ParameterizedType]	2435	11202	
20	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2230	6542	
21	[Java, ByteCode, Constructor, Method, Member]	WRITES	[Java, ByteCode, Member, Field]	1971	1648	
22	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	1892	10568	
23	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalType, Ext...	1842	2225	
24	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	1819	11202	
25	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	1741	1648	
26	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	1710	1648	
27	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	1697	10568	
28	[Java, ByteCode, Parameter]	ANNOTATED_BY	[Java, Value, ByteCode, Annotation]	1594	11202	
29	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	1539	1648	

## Graph Density

```
total_number_of_nodes (vertices): 307227
total_number_of_relationships (edges): 953778
-> total directed graph density: 1.0104851931987106e-05
-> total directed graph density in percent: 0.0010104851931987105
```