

# 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]	249837	73.732595
1	[Java, ByteCode, Member, Method]	13200	3.895621
2	[Java, ByteCode, Parameter]	13029	3.845155
3	[Git, Commit]	12283	3.624993
4	[File, Git]	10736	3.168438
5	[Java, ByteCode, Bound, ParameterizedType]	7176	2.117801
6	[Java, ByteCode, Bound]	7118	2.100684
7	[Java, ByteCode, Member, Field]	3505	1.034405
8	[Java, ByteCode, Bound, WildcardType]	2908	0.858217
9	[Java, Value, ByteCode, Annotation]	2822	0.832837
10	[Xml, Element]	2144	0.632743
11	[Java, ByteCode, Member, Method, Constructor]	2047	0.604116
12	[Xml, Text]	1436	0.423796
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.323455
14	[Java, ByteCode, Member, Method, Lambda]	942	0.278006
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	899	0.265315
16	[Type, File, Java, ByteCode, Class]	864	0.254986
17	[Type, File, Java, ByteCode, JavaType]	748	0.220752
18	[Java, Value, ByteCode, Primitive]	652	0.192420
19	[Java, ByteCode, GenericDeclaration, Member, M...	569	0.167925
20	[Json, Key]	560	0.165269
21	[Value, Json, Scalar]	544	0.160547
22	[Type, File, Java, ByteCode, ExternalType]	396	0.116869
23	[Author, Git, Person]	298	0.087947
24	[Value, Array]	267	0.078798
25	[Committer, Git, Person]	252	0.074371
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.069649
27	[Value, Property]	202	0.059615
28	[Type, File, Java, ByteCode, Interface]	188	0.055483
29	[Java, Value, ByteCode, Class]	172	0.050761

## 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)

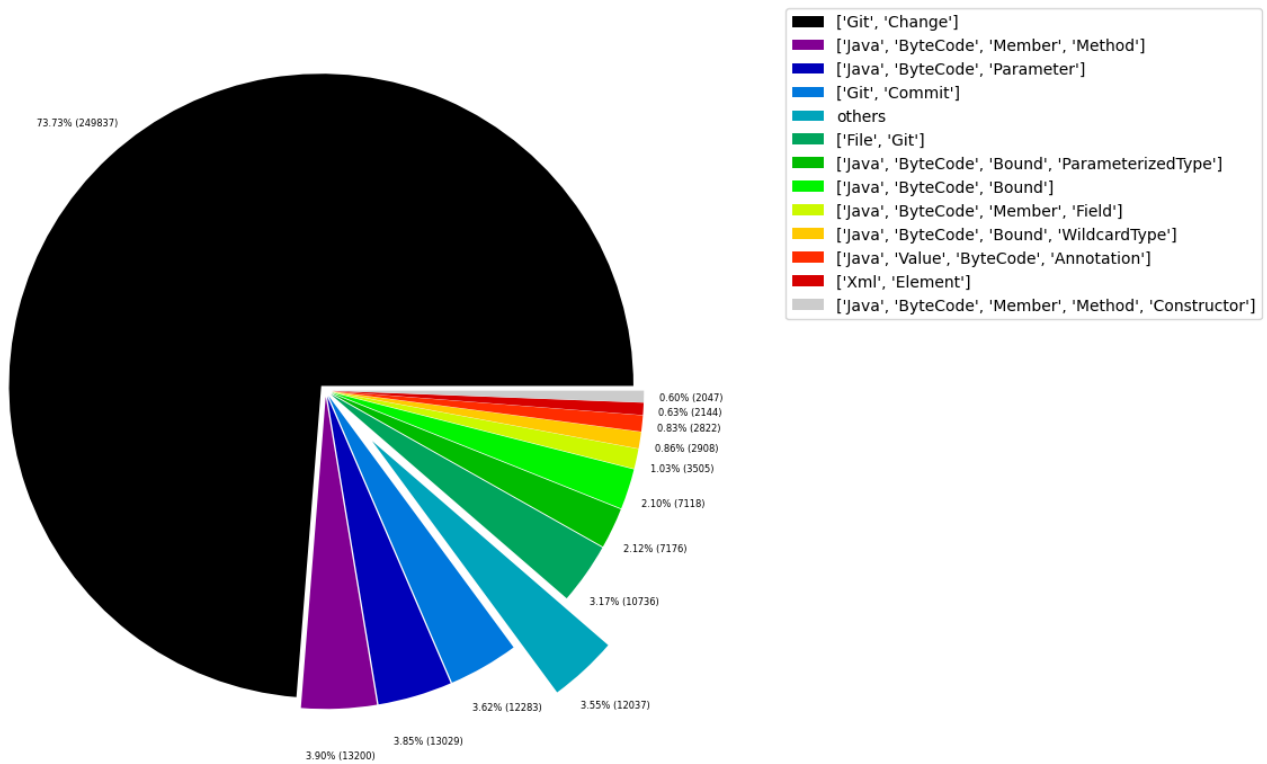


Table 1b - Lowest node count by label combination

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	0.000295
1	[Repository, File, Git]	1	0.000295
2	[File, Json]	2	0.000590
3	[File]	3	0.000885
4	[Java, ByteCode, GenericDeclaration, Member, M...	4	0.001180
5	[Maven, Exclusion]	5	0.001476
6	[Value, Array, Json]	6	0.001771
7	[Type, File, Java, ByteCode, Void]	9	0.002656
8	[File, Maven, Xml, Pom, Document]	9	0.002656
9	[Java, ManifestSection]	9	0.002656
10	[File, Java, Manifest]	9	0.002656
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002656
12	[File, Java, ServiceLoader]	10	0.002951
13	[File, Java, Properties]	12	0.003541
14	[Maven, ExecutionGoal]	16	0.004722
15	[Maven, PluginExecution]	16	0.004722
16	[Xml, Attribute]	18	0.005312
17	[jQAssistant, Rule, Concept]	19	0.005607
18	[Maven, Plugin]	21	0.006198
19	[Maven, Configuration]	21	0.006198
20	[Type, File, Java, ByteCode, Enum]	28	0.008263
21	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008559
22	[Git, Branch]	34	0.010034
23	[Xml, Namespace]	36	0.010624
24	[Type, File, Java, ByteCode, Annotation]	43	0.012690
25	[File, Directory]	44	0.012985
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.025085
27	[Artifact, Maven]	92	0.027151
28	[Type, File, Java, ByteCode, ExternalAnnotatio...	93	0.027446
29	[Value, ManifestEntry]	120	0.035415

## 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)

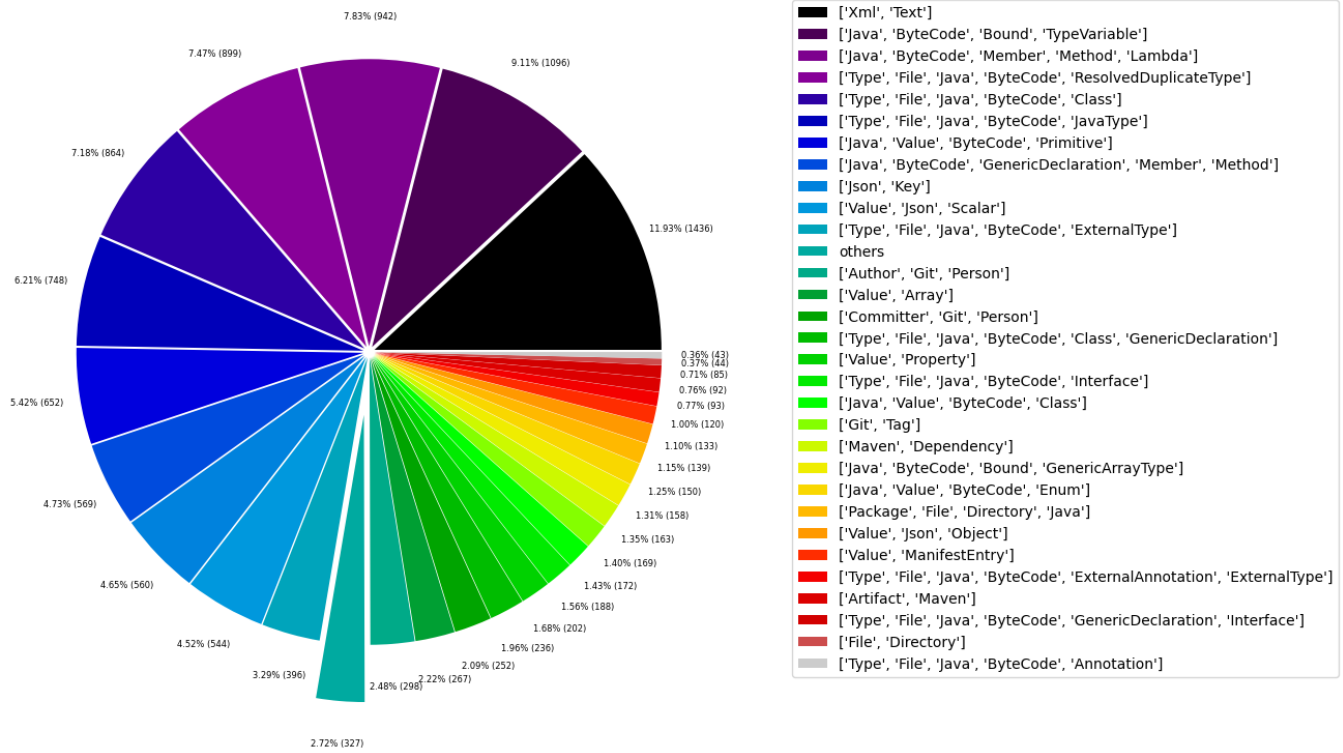


Table 1c - Highest node count by single label

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.

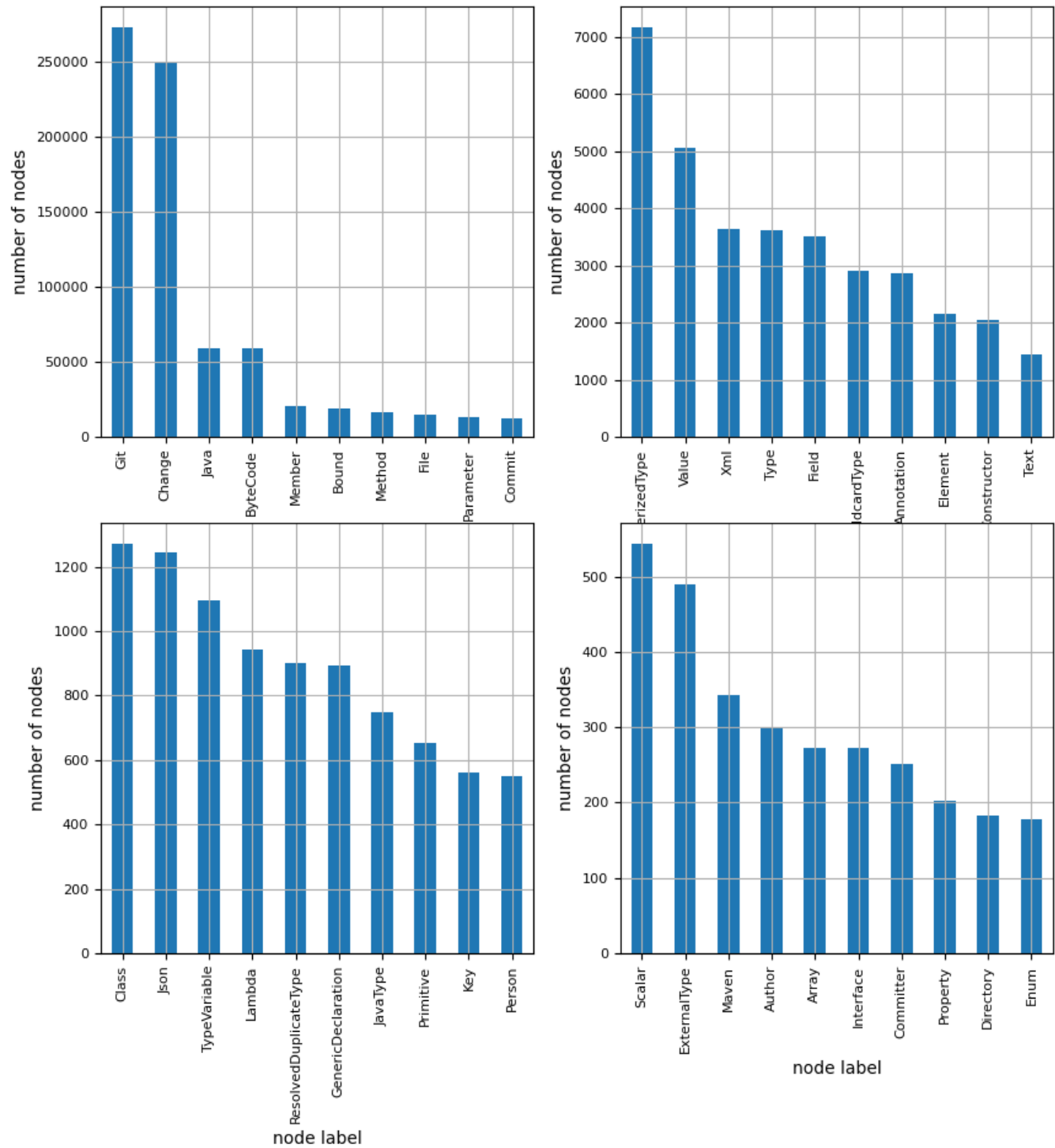
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	273610	80.748549
1	Change	249837	73.732595
2	Java	59354	17.516719
3	ByteCode	59166	17.461236
4	Member	20267	5.981254
5	Bound	18456	5.446786
6	Method	16762	4.946848
7	File	14592	4.306432
8	Parameter	13029	3.845155
9	Commit	12283	3.624993
10	ParameterizedType	7176	2.117801
11	Value	5068	1.495682
12	Xml	3643	1.075132
13	Type	3618	1.067754
14	Field	3505	1.034405
15	WildcardType	2908	0.858217
16	Annotation	2865	0.845527
17	Element	2144	0.632743
18	Constructor	2051	0.605297
19	Text	1436	0.423796
20	Class	1272	0.375396
21	Json	1245	0.367428
22	TypeVariable	1096	0.323455
23	Lambda	942	0.278006
24	ResolvedDuplicateType	899	0.265315
25	GenericDeclaration	894	0.263840
26	JavaType	748	0.220752
27	Primitive	652	0.192420
28	Key	560	0.165269
29	Person	550	0.162318
30	Scalar	544	0.160547
31	ExternalType	489	0.144315
32	Maven	343	0.101227
33	Author	298	0.087947
34	Array	273	0.080569
35	Interface	273	0.080569
36	Committer	252	0.074371
37	Property	202	0.059615
38	Directory	183	0.054007
39	Enum	178	0.052532

## 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: 1051170

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	249837	23.767516
1	MODIFIES	249837	23.767516
2	UPDATES	162807	15.488170
3	CREATES	60062	5.713824
4	DELETES	37341	3.552327
5	INVOKES	35685	3.394789
6	COMMITTED	24566	2.337015
7	DEPENDS_ON	21931	2.086342
8	OF_TYPE	21394	2.035256
9	DECLARES	20712	1.970376
10	OF_RAW_TYPE	17093	1.626093
11	HAS_PARENT	14918	1.419181
12	HAS	14125	1.343741
13	RETURNS	12578	1.196571
14	HAS_COMMIT	12283	1.168507
15	HAS_FILE	10736	1.021338
16	RENAMES	10373	0.986805
17	READS	9164	0.871790
18	HAS_ACTUAL_TYPE_ARGUMENT	8288	0.788455
19	HAS_NEW_NAME	6208	0.590580
20	OF_GENERIC_TYPE	5906	0.561850
21	RESOLVES_TO	5185	0.493260
22	SIMILAR	3977	0.378340
23	WRITES	3818	0.363214
24	CONTAINS	3814	0.362834
25	RETURNS_GENERIC	3545	0.337243
26	ANNOTATED_BY	2810	0.267321
27	REQUIRES	2174	0.206817
28	HAS_FIRST_CHILD	2144	0.203963
29	HAS_LAST_CHILD	2144	0.203963

## 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)

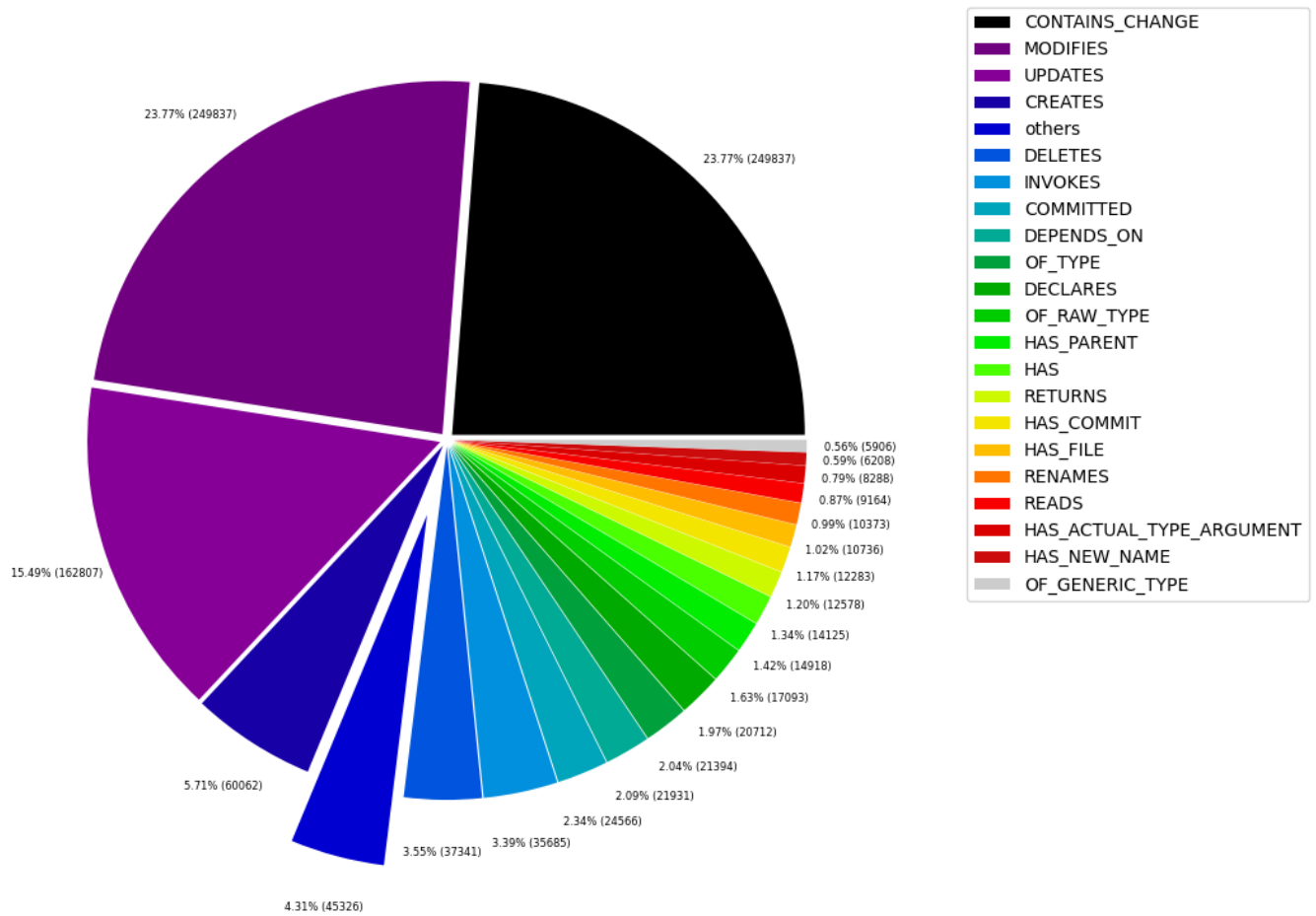


Table 2b - Lowest relationship count by type

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.

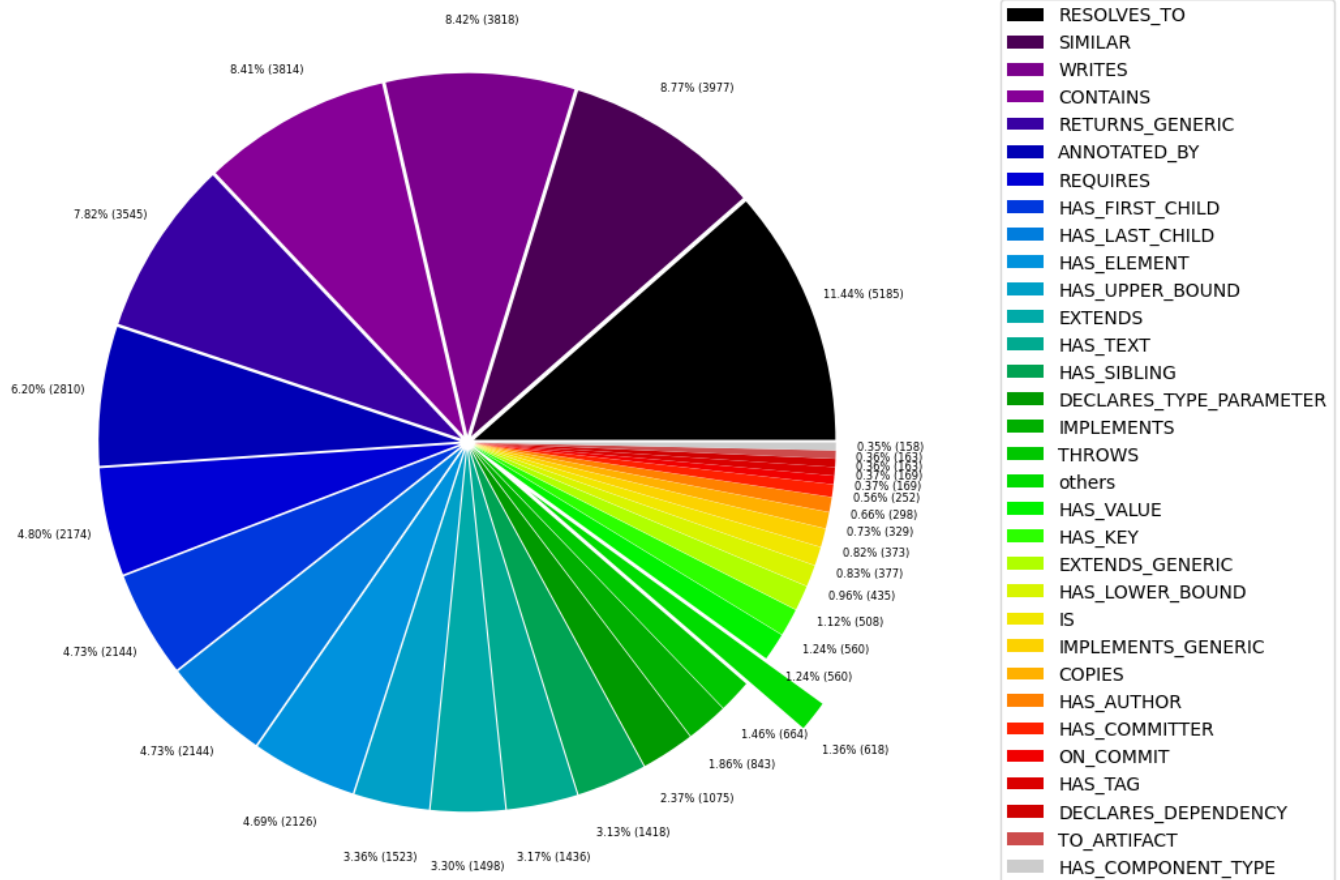
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000095
1	THROWS_GENERIC	5	0.000476
2	EXCLUDES	5	0.000476
3	DESCRIBES	9	0.000856
4	HAS_ROOT_ELEMENT	11	0.001046
5	HAS_GOAL	16	0.001522
6	HAS_EXECUTION	16	0.001522
7	OF_NAMESPACE	18	0.001712
8	HAS_ATTRIBUTE	18	0.001712
9	INCLUDES_CONCEPT	19	0.001808
10	USES_PLUGIN	21	0.001998
11	REQUIRES_TYPE_PARAMETER	21	0.001998
12	IS_ARTIFACT	21	0.001998
13	HAS_CONFIGURATION	21	0.001998
14	REQUIRES_CONCEPT	28	0.002664
15	HAS_BRANCH	34	0.003234
16	HAS_HEAD	35	0.003330
17	DECLARES_NAMESPACE	36	0.003425
18	HAS_DEFAULT	36	0.003425
19	CONTAINS_VALUE	121	0.011511
20	COPY_OF	126	0.011987
21	HAS_COMPONENT_TYPE	158	0.015031
22	TO_ARTIFACT	163	0.015507
23	DECLARES_DEPENDENCY	163	0.015507
24	ON_COMMIT	169	0.016077
25	HAS_TAG	169	0.016077
26	HAS_COMMITTER	252	0.023973
27	HAS_AUTHOR	298	0.028349
28	COPIES	329	0.031298
29	IMPLEMENTS_GENERIC	373	0.035484

## 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]	249837		12283
1	[Git, Change]	MODIFIES	[File, Git]	249837		249837
2	[Git, Change]	UPDATES	[File, Git]	162807		249837
3	[Git, Change]	CREATES	[File, Git]	60062		249837
4	[Git, Change]	DELETES	[File, Git]	37341		249837
5	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Method]	21760		13106
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14909		12283
7	[Repository, File, Git]	HAS_COMMIT	[Git, Commit]	12283		1
8	[Author, Git, Person]	COMMITTED	[Git, Commit]	12283		298
9	[Committer, Git, Person]	COMMITTED	[Git, Commit]	12283		252
10	[Repository, File, Git]	HAS_FILE	[File, Git]	10736		1
11	[Git, Change]	RENAMES	[File, Git]	10373		249837
12	[Java, ByteCode, Member, Method]	HAS	[Java, ByteCode, Parameter]	8361		13106
13	[Java, ByteCode, Member, Method]	READS	[Java, ByteCode, Member, Field]	8218		13106
14	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6371		13029
15	[File, Git]	HAS_NEW_NAME	[File, Git]	6208		10736
16	[Type, File, Java, ByteCode, Class]	DECLARES	[Java, ByteCode, Member, Method]	5101		814
17	[Type, File, Java, ByteCode, Class]	DEPENDS_ON	[Type, File, Java, ByteCode, JavaType]	4480		814
18	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3570		7118
19	[Java, ByteCode, Bound, ParameterizedType]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3053		7176
20	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2908		7176
21	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound, ParameterizedType]	2657		13029
22	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2454		7176
23	[Java, ByteCode, Member, Method, Constructor]	WRITES	[Java, ByteCode, Member, Field]	2438		2047
24	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalAnnotatio...	2341		2822
25	[Type, File, Java, ByteCode, Class]	DECLARES	[Java, ByteCode, Member, Field]	2203		814
26	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126		2144
27	[Java, ByteCode, Member, Method, Constructor]	INVOKES	[Java, ByteCode, Member, Method, Constructor]	2117		2047
28	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2092		13106
29	[Type, File, Java, ByteCode, Class, GenericDec...	DECLARES	[Java, ByteCode, Member, Method]	2069		230

## Graph Density

```
total_number_of_nodes (vertices): 338842
total_number_of_relationships (edges): 1051170
-> total directed graph density: 9.155451503917585e-06
-> total directed graph density in percent: 0.0009155451503917584
```