

# 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]	260666	74.412431
1	[Java, ByteCode, Member, Method]	13197	3.767353
2	[Java, ByteCode, Parameter]	13029	3.719394
3	[Git, Commit]	12799	3.653736
4	[File, Git]	10819	3.088504
5	[Java, ByteCode, Bound, ParameterizedType]	7176	2.048536
6	[Java, ByteCode, Bound]	7118	2.031978
7	[Java, ByteCode, Member, Field]	3502	0.999717
8	[Java, ByteCode, Bound, WildcardType]	2908	0.830148
9	[Java, Value, ByteCode, Annotation]	2822	0.805598
10	[Xml, Element]	2144	0.612049
11	[Java, ByteCode, Member, Method, Constructor]	2039	0.582074
12	[Xml, Text]	1436	0.409936
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.312876
14	[Java, ByteCode, Member, Method, Lambda]	942	0.268913
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	877	0.250358
16	[Type, File, Java, ByteCode, Class]	810	0.231231
17	[Java, Value, ByteCode, Primitive]	652	0.186127
18	[Type, File, Java, ByteCode, JavaType]	644	0.183843
19	[Java, ByteCode, Member, Method, GenericDeclar...	569	0.162433
20	[Json, Key]	568	0.162147
21	[Value, Json, Scalar]	551	0.157294
22	[Type, File, Java, ByteCode, ExternalType]	380	0.108479
23	[Author, Git, Person]	298	0.085070
24	[Value, Array]	267	0.076221
25	[Committer, Git, Person]	252	0.071939
26	[Type, File, Java, ByteCode, GenericDeclaratio...	236	0.067371
27	[Value, Property]	202	0.057665
28	[Type, File, Java, ByteCode, Interface]	188	0.053668
29	[Java, Value, ByteCode, Class]	172	0.049101

## 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)

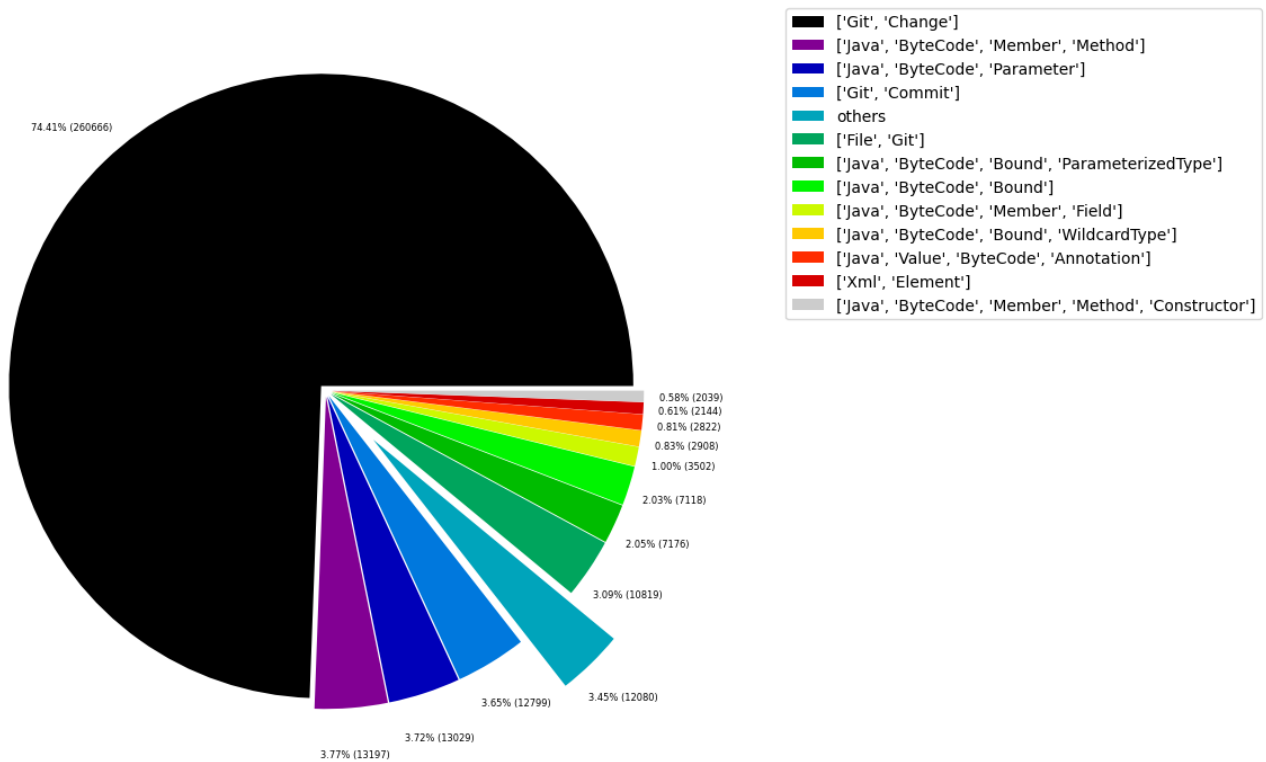


Table 1b - Lowest node count by label combination

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.

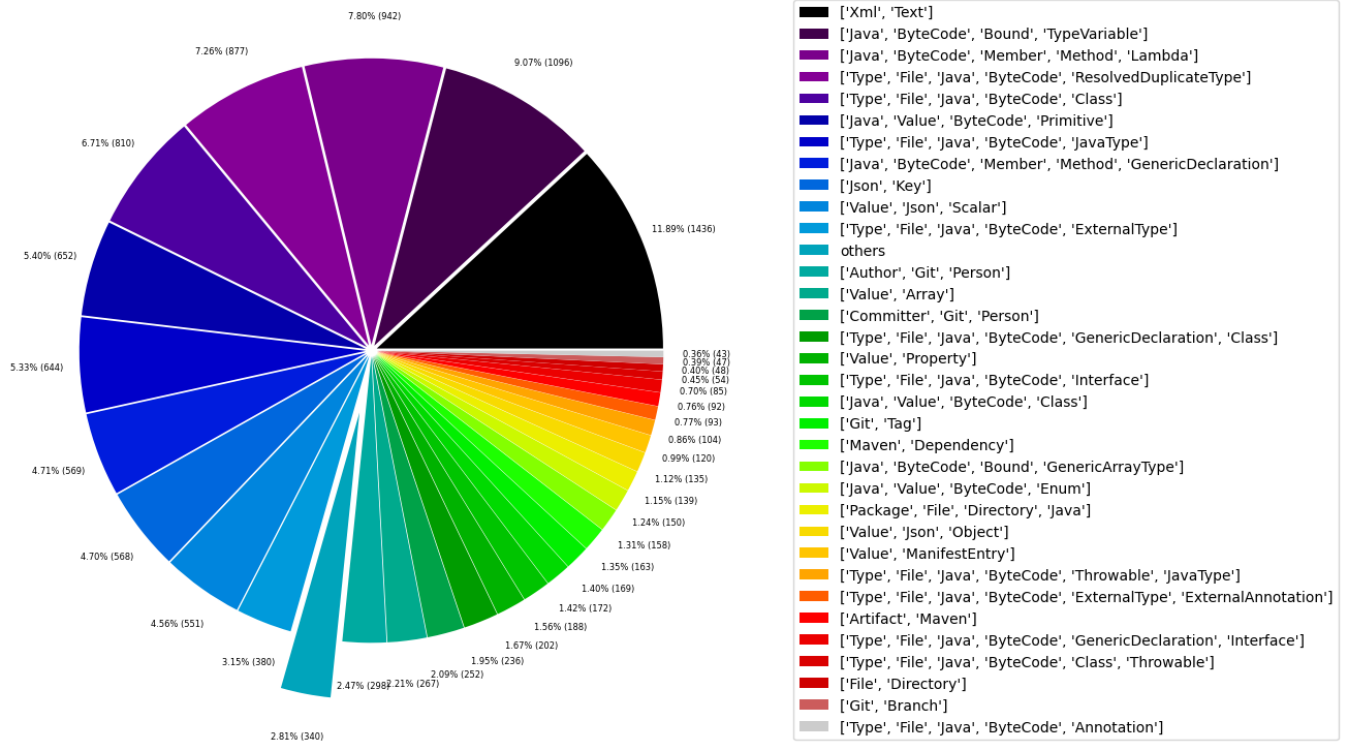
	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Analyze, Task, jQAssistant]	1	0.000285
1	[Package, File, Json, NPM]	1	0.000285
2	[Repository, File, Git]	1	0.000285
3	[File, TS, Scan]	1	0.000285
4	[File, Json]	2	0.000571
5	[File]	3	0.000856
6	[Java, ByteCode, Member, Method, GenericDeclar...	4	0.001142
7	[Maven, Exclusion]	5	0.001427
8	[Value, Array, Json]	6	0.001713
9	[Dependency, NPM]	7	0.001998
10	[Type, File, Java, ByteCode, Void]	9	0.002569
11	[File, Maven, Xml, Pom, Document]	9	0.002569
12	[Java, ManifestSection]	9	0.002569
13	[File, Java, Manifest]	9	0.002569
14	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002569
15	[File, Java, ServiceLoader]	10	0.002855
16	[File, Java, Properties]	12	0.003426
17	[Maven, PluginExecution]	16	0.004568
18	[Maven, ExecutionGoal]	16	0.004568
19	[Type, File, Java, ByteCode, Throwable, Extern...	16	0.004568
20	[Xml, Attribute]	18	0.005138
21	[jQAssistant, Rule, Concept]	19	0.005424
22	[Maven, Configuration]	21	0.005995
23	[Maven, Plugin]	21	0.005995
24	[Type, File, Java, ByteCode, Throwable, Resolv...	22	0.006280
25	[Type, File, Java, ByteCode, Enum]	28	0.007993
26	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008279
27	[Xml, Namespace]	36	0.010277
28	[Type, File, Java, ByteCode, Annotation]	43	0.012275
29	[Git, Branch]	47	0.013417

## 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.

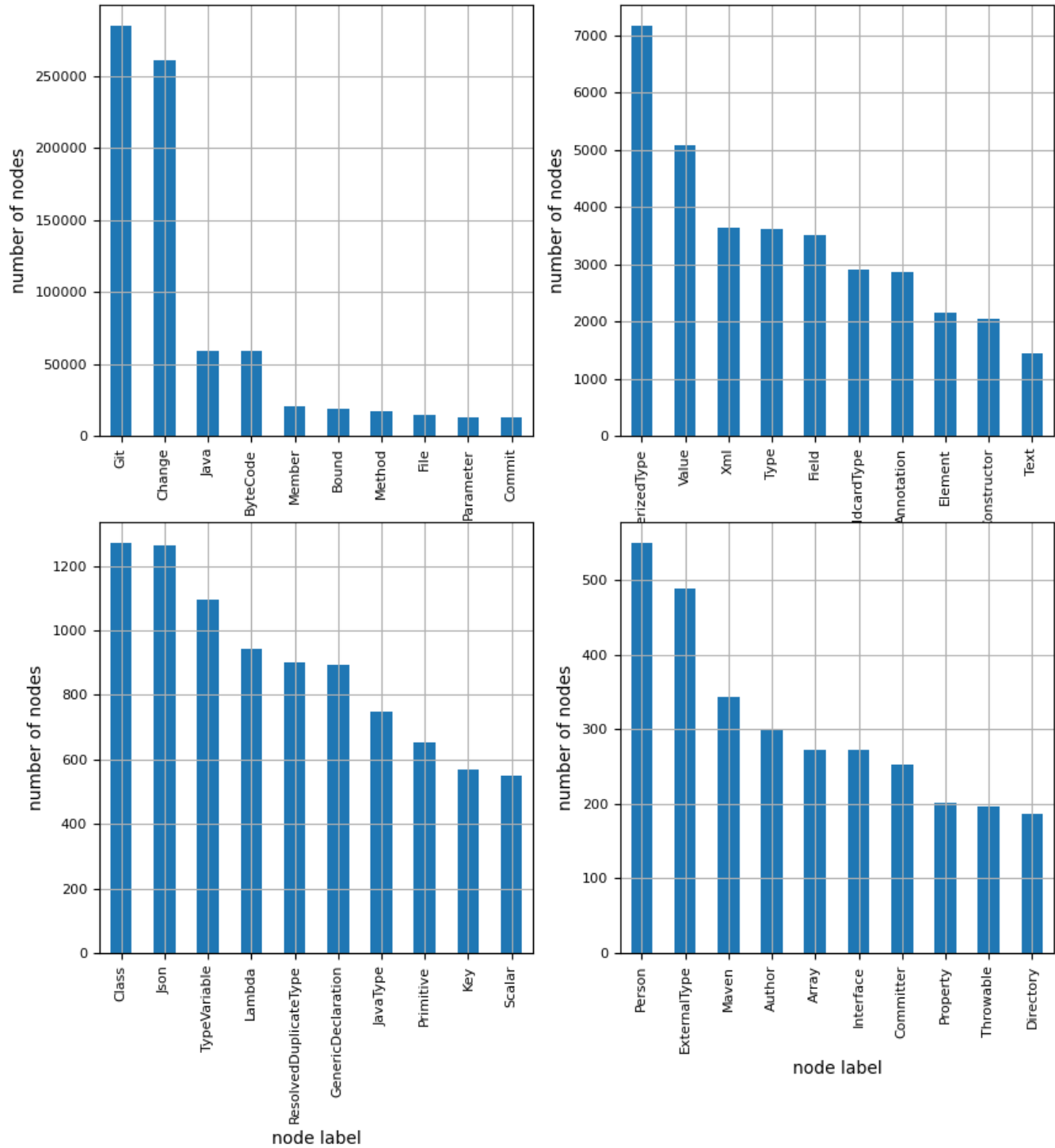
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	285051	81.373627
1	Change	260666	74.412431
2	Java	59340	16.939814
3	ByteCode	59152	16.886146
4	Member	20253	5.781632
5	Bound	18456	5.268642
6	Method	16751	4.781915
7	File	14681	4.190991
8	Parameter	13029	3.719394
9	Commit	12799	3.653736
10	ParameterizedType	7176	2.048536
11	Value	5077	1.449333
12	Xml	3643	1.039969
13	Type	3618	1.032832
14	Field	3502	0.999717
15	WildcardType	2908	0.830148
16	Annotation	2865	0.817873
17	Element	2144	0.612049
18	Constructor	2043	0.583216
19	Text	1436	0.409936
20	Class	1272	0.363118
21	Json	1263	0.360549
22	TypeVariable	1096	0.312876
23	Lambda	942	0.268913
24	ResolvedDuplicateType	899	0.256638
25	GenericDeclaration	894	0.255211
26	JavaType	748	0.213532
27	Primitive	652	0.186127
28	Key	568	0.162147
29	Scalar	551	0.157294
30	Person	550	0.157009
31	ExternalType	489	0.139595
32	Maven	343	0.097916
33	Author	298	0.085070
34	Array	273	0.077933
35	Interface	273	0.077933
36	Committer	252	0.071939
37	Property	202	0.057665
38	Throwable	196	0.055952
39	Directory	187	0.053383

## 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: 1087767

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	260666	23.963404
1	MODIFIES	260666	23.963404
2	UPDATES	171945	15.807154
3	CREATES	61275	5.633100
4	DELETES	38002	3.493579
5	INVOKES	35947	3.304660
6	COMMITTED	25598	2.353261
7	DEPENDS_ON	21931	2.016149
8	OF_TYPE	21394	1.966781
9	DECLARES	20698	1.902797
10	OF_RAW_TYPE	17093	1.571384
11	HAS_PARENT	15490	1.424018
12	HAS	14125	1.298532
13	HAS_COMMIT	12799	1.176631
14	RETURNS	12578	1.156314
15	HAS_FILE	10819	0.994606
16	RENAMES	10556	0.970428
17	READS	9161	0.842184
18	HAS_ACTUAL_TYPE_ARGUMENT	8288	0.761928
19	HAS_NEW_NAME	6237	0.573376
20	OF_GENERIC_TYPE	5906	0.542947
21	RESOLVES_TO	5216	0.479514
22	SIMILAR	3977	0.365611
23	CONTAINS	3824	0.351546
24	WRITES	3818	0.350994
25	RETURNS_GENERIC	3545	0.325897
26	ANNOTATED_BY	2810	0.258327
27	REQUIRES	2174	0.199859
28	HAS_FIRST_CHILD	2144	0.197101
29	HAS_LAST_CHILD	2144	0.197101

## 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)

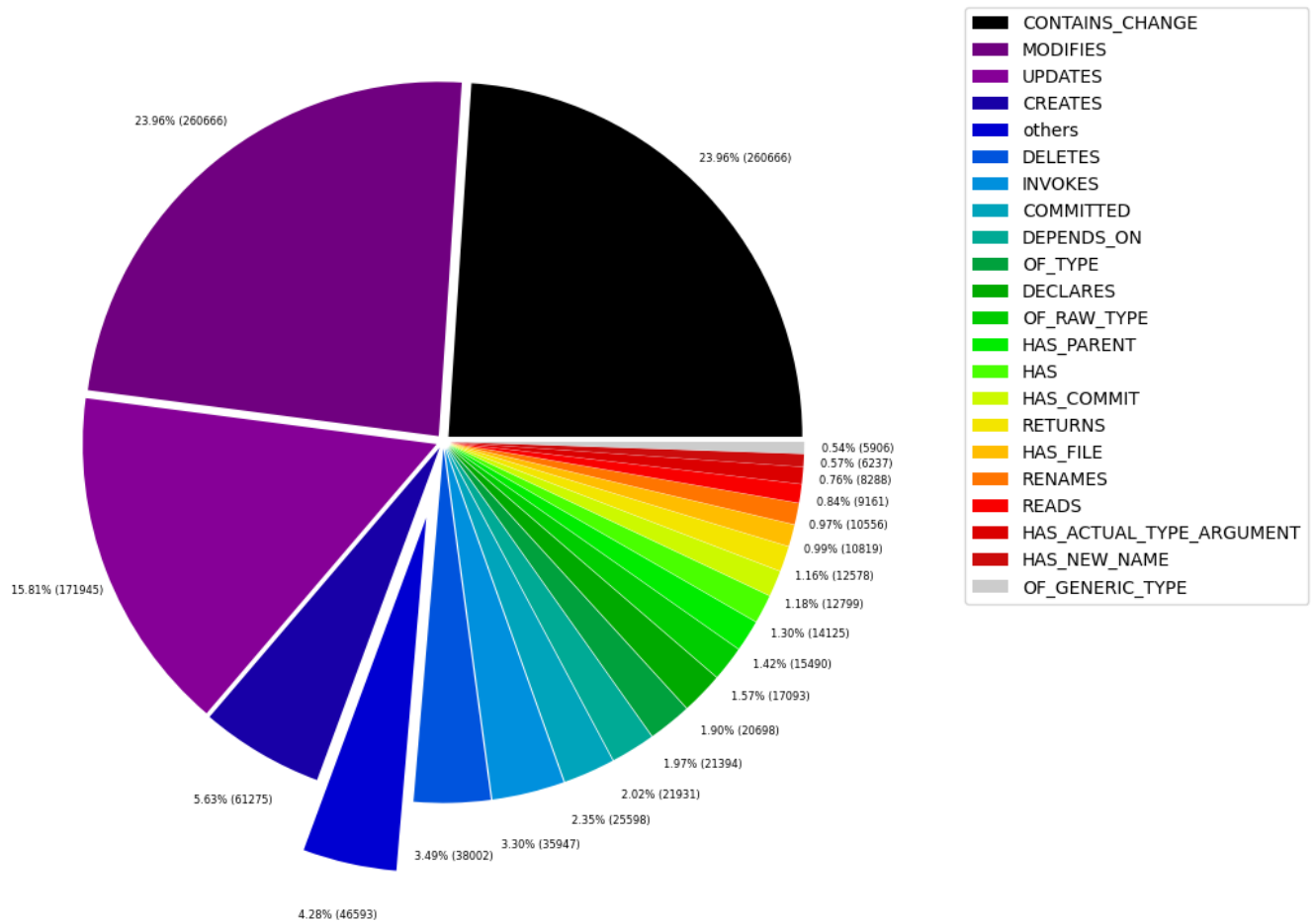


Table 2b - Lowest relationship count by type

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.

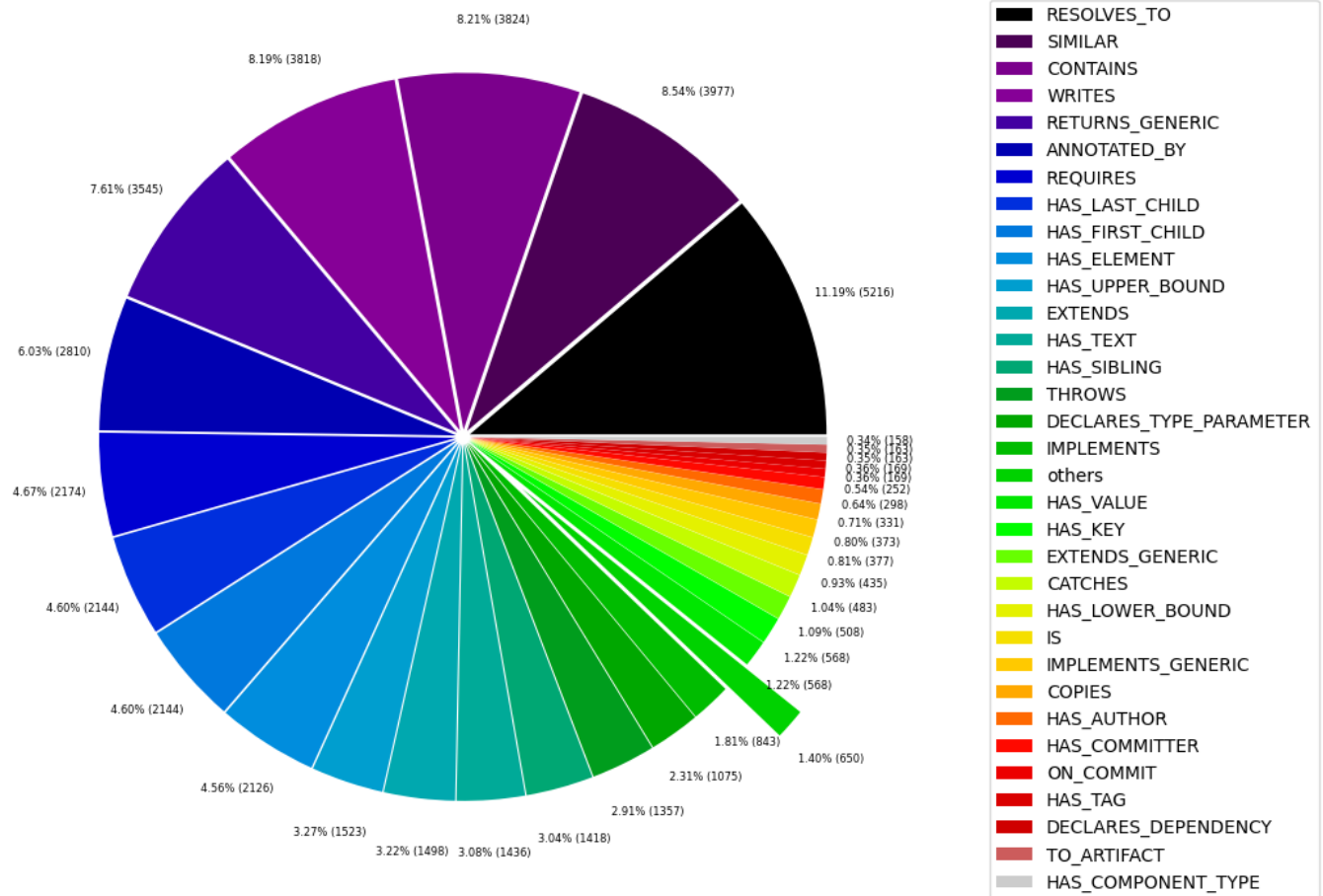
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000092
1	THROWS_GENERIC	5	0.000460
2	EXCLUDES	5	0.000460
3	DECLARES_DEV_DEPENDENCY	7	0.000644
4	DESCRIBES	9	0.000827
5	HAS_ROOT_ELEMENT	10	0.000919
6	HAS_GOAL	16	0.001471
7	HAS_EXECUTION	16	0.001471
8	OF_NAMESPACE	18	0.001655
9	HAS_ATTRIBUTE	18	0.001655
10	INCLUDES_CONCEPT	19	0.001747
11	REQUIRES_TYPE_PARAMETER	21	0.001931
12	IS_ARTIFACT	21	0.001931
13	HAS_CONFIGURATION	21	0.001931
14	USES_PLUGIN	21	0.001931
15	REQUIRES_CONCEPT	28	0.002574
16	HAS_DEFAULT	36	0.003310
17	DECLARES_NAMESPACE	36	0.003310
18	HAS_BRANCH	47	0.004321
19	HAS_HEAD	48	0.004413
20	CONTAINS_VALUE	121	0.011124
21	COPY_OF	126	0.011583
22	HAS_COMPONENT_TYPE	158	0.014525
23	TO_ARTIFACT	163	0.014985
24	DECLARES_DEPENDENCY	163	0.014985
25	ON_COMMIT	169	0.015536
26	HAS_TAG	169	0.015536
27	HAS_COMMITTER	252	0.023167
28	HAS_AUTHOR	298	0.027396
29	COPIES	331	0.030429

## 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, Change]	MODIFIES	[File, Git]	260666	260666	
1	[Git, Commit]	CONTAINS_CHANGE	[Git, Change]	260666	12799	
2	[Git, Change]	UPDATES	[File, Git]	171945	260666	
3	[Git, Change]	CREATES	[File, Git]	61275	260666	
4	[Git, Change]	DELETES	[File, Git]	38002	260666	
5	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Method]	21999	13102	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	15481	12799	
7	[Repository, File, Git]	HAS_COMMIT	[Git, Commit]	12799	1	
8	[Author, Git, Person]	COMMITTED	[Git, Commit]	12799	298	
9	[Committer, Git, Person]	COMMITTED	[Git, Commit]	12799	252	
10	[Repository, File, Git]	HAS_FILE	[File, Git]	10819	1	
11	[Git, Change]	RENAMES	[File, Git]	10556	260666	
12	[Java, ByteCode, Member, Method]	HAS	[Java, ByteCode, Parameter]	8363	13102	
13	[Java, ByteCode, Member, Method]	READS	[Java, ByteCode, Member, Field]	8221	13102	
14	[File, Git]	HAS_NEW_NAME	[File, Git]	6237	10819	
15	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6079	13029	
16	[Type, File, Java, ByteCode, Class]	DECLARES	[Java, ByteCode, Member, Method]	5091	771	
17	[Type, File, Java, ByteCode, Class]	DEPENDS_ON	[Type, File, Java, ByteCode, JavaType]	4020	771	
18	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3427	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	2039	
24	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalType, Ext...	2341	2822	
25	[Type, File, Java, ByteCode, Class]	DECLARES	[Java, ByteCode, Member, Field]	2142	771	
26	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126	2144	
27	[Java, ByteCode, Member, Method, Constructor]	INVOKES	[Java, ByteCode, Member, Method, Constructor]	2119	2039	
28	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2080	13102	
29	[Type, File, Java, ByteCode, GenericDeclaratio...	DECLARES	[Java, ByteCode, Member, Method]	2058	229	

## Graph Density

```
total_number_of_nodes (vertices): 350299
total_number_of_relationships (edges): 1087767
-> total directed graph density: 8.864603683317987e-06
-> total directed graph density in percent: 0.0008864603683317987
```