

# 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	73.731942
1	[Java, ByteCode, Member, Method]	13200	3.895586
2	[Java, ByteCode, Parameter]	13029	3.845121
3	[Git, Commit]	12283	3.624961
4	[File, Git]	10736	3.168410
5	[Java, ByteCode, Bound, ParameterizedType]	7176	2.117782
6	[Java, ByteCode, Bound]	7118	2.100665
7	[Java, ByteCode, Member, Field]	3505	1.034396
8	[Java, ByteCode, Bound, WildcardType]	2908	0.858210
9	[Java, Value, ByteCode, Annotation]	2822	0.832829
10	[Xml, Element]	2144	0.632738
11	[Java, ByteCode, Member, Method, Constructor]	2050	0.604996
12	[Xml, Text]	1436	0.423793
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.323452
14	[Java, ByteCode, Member, Method, Lambda]	942	0.278003
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	899	0.265313
16	[Type, File, Java, ByteCode, Class]	864	0.254984
17	[Type, File, Java, ByteCode, JavaType]	748	0.220750
18	[Java, Value, ByteCode, Primitive]	652	0.192418
19	[Java, ByteCode, GenericDeclaration, Member, M...	569	0.167923
20	[Json, Key]	560	0.165267
21	[Value, Json, Scalar]	544	0.160545
22	[Type, File, Java, ByteCode, ExternalType]	396	0.116868
23	[Author, Git, Person]	298	0.087946
24	[Value, Array]	267	0.078797
25	[Committer, Git, Person]	252	0.074370
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.069648
27	[Value, Property]	202	0.059614
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)

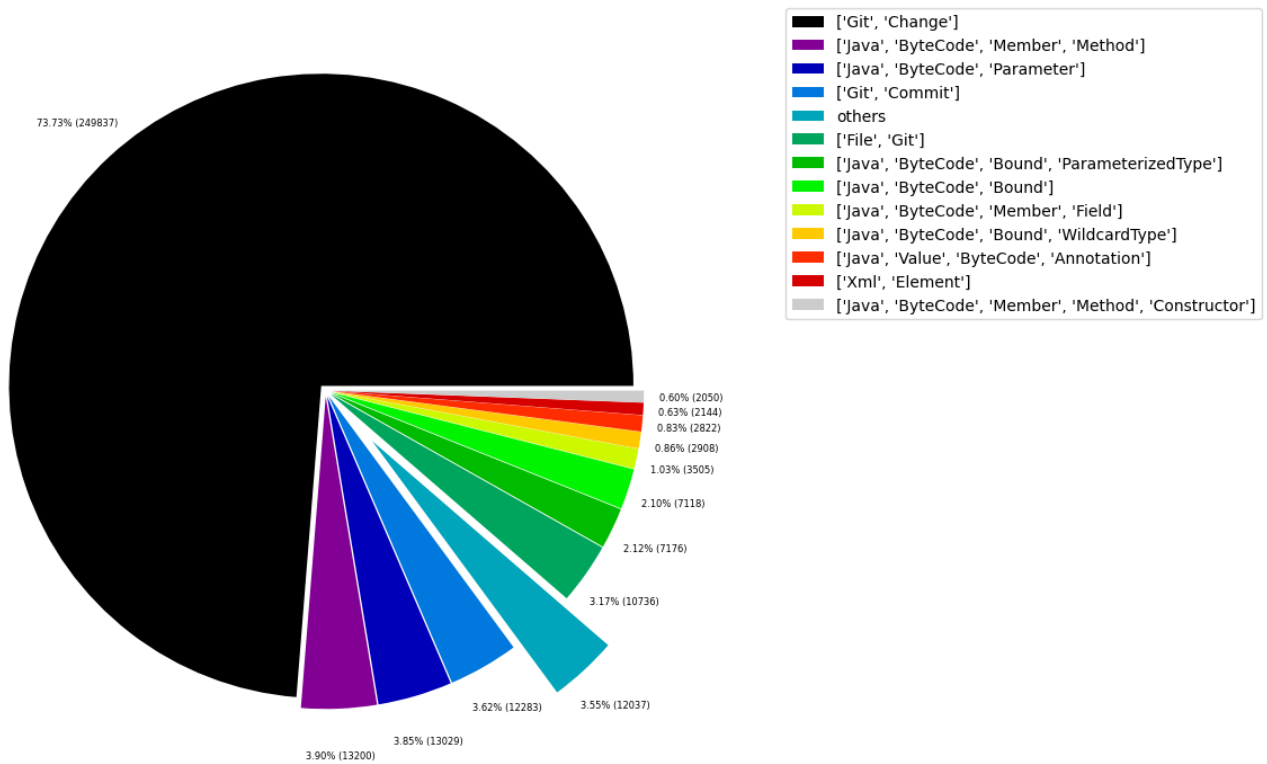


Table 1b - Lowest node count by label combination

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	0.008558
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	0.035414

## 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)

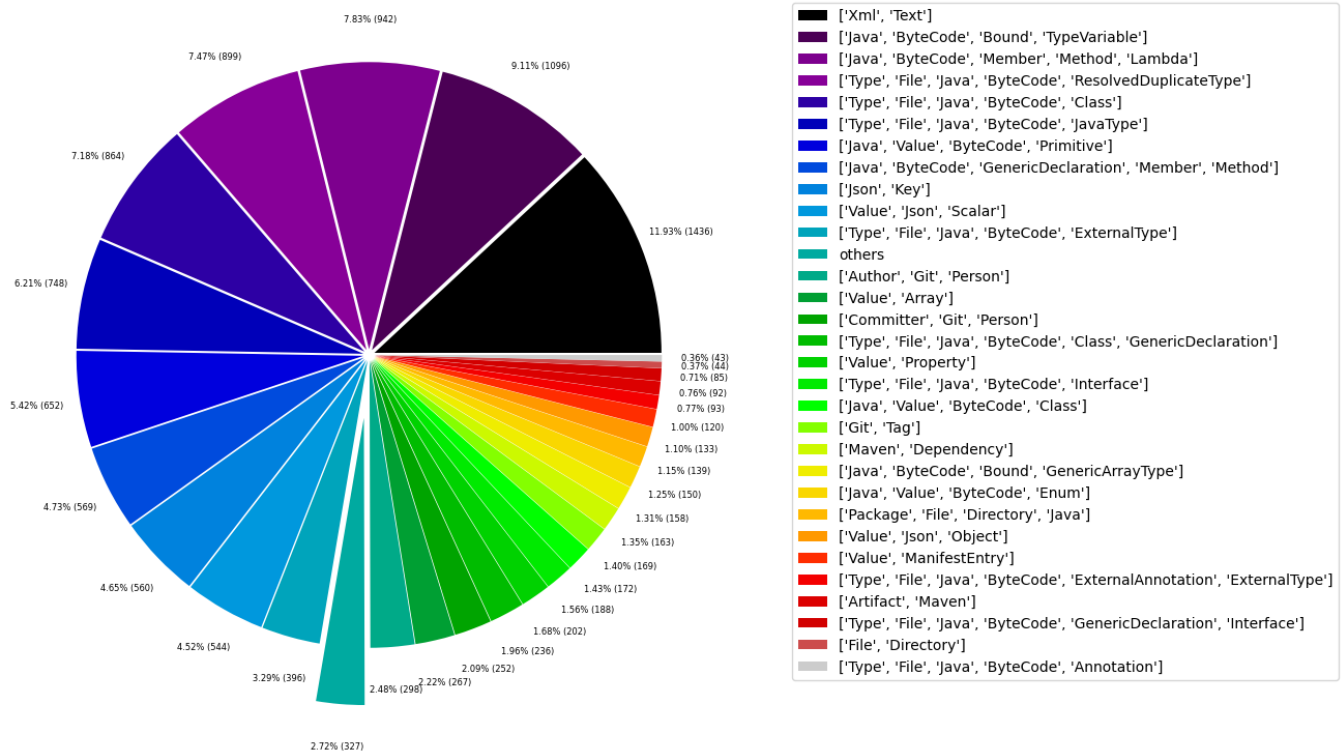


Table 1c - Highest node count by single label

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.

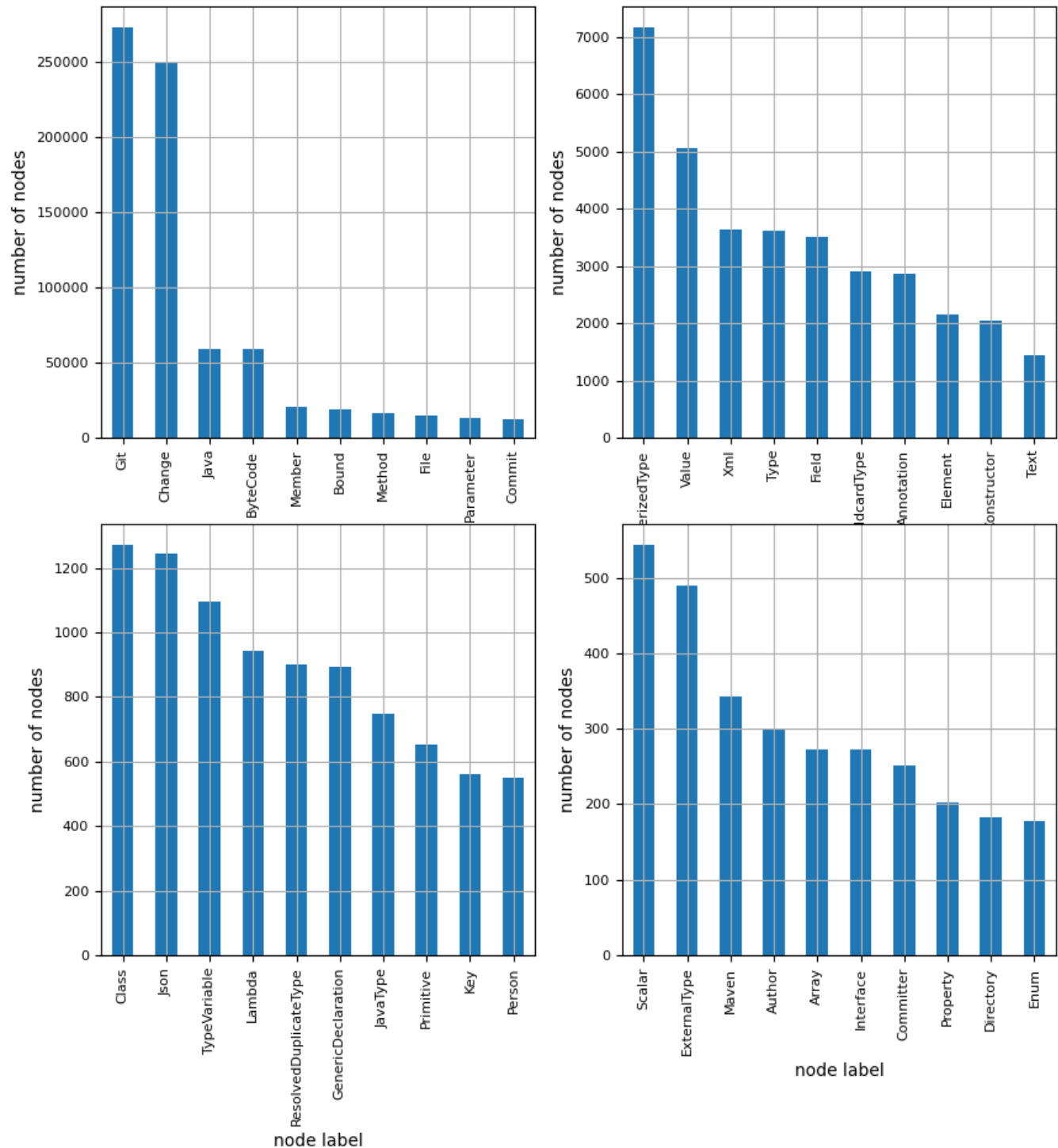
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	273610	80.747835
1	Change	249837	73.731942
2	Java	59357	17.517449
3	ByteCode	59169	17.461966
4	Member	20270	5.982086
5	Bound	18456	5.446738
6	Method	16765	4.947690
7	File	14592	4.306394
8	Parameter	13029	3.845121
9	Commit	12283	3.624961
10	ParameterizedType	7176	2.117782
11	Value	5068	1.495669
12	Xml	3643	1.075123
13	Type	3618	1.067745
14	Field	3505	1.034396
15	WildcardType	2908	0.858210
16	Annotation	2865	0.845519
17	Element	2144	0.632738
18	Constructor	2054	0.606177
19	Text	1436	0.423793
20	Class	1272	0.375393
21	Json	1245	0.367425
22	TypeVariable	1096	0.323452
23	Lambda	942	0.278003
24	ResolvedDuplicateType	899	0.265313
25	GenericDeclaration	894	0.263837
26	JavaType	748	0.220750
27	Primitive	652	0.192418
28	Key	560	0.165267
29	Person	550	0.162316
30	Scalar	544	0.160545
31	ExternalType	489	0.144314
32	Maven	343	0.101226
33	Author	298	0.087946
34	Array	273	0.080568
35	Interface	273	0.080568
36	Committer	252	0.074370
37	Property	202	0.059614
38	Directory	183	0.054007
39	Enum	178	0.052531

## 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: 1051880

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	249837	23.751474
1	MODIFIES	249837	23.751474
2	UPDATES	162807	15.477716
3	CREATES	60062	5.709967
4	DELETES	37341	3.549930
5	INVOKES	35691	3.393068
6	COMMITTED	24566	2.335438
7	DEPENDS_ON	21931	2.084934
8	OF_TYPE	21394	2.033882
9	DECLARES	20715	1.969331
10	OF_RAW_TYPE	17093	1.624995
11	HAS_PARENT	14918	1.418223
12	HAS	14125	1.342834
13	RETURNS	12578	1.195764
14	HAS_COMMIT	12283	1.167719
15	HAS_FILE	10736	1.020649
16	RENAMES	10373	0.986139
17	READS	9164	0.871202
18	HAS_ACTUAL_TYPE_ARGUMENT	8288	0.787923
19	HAS_NEW_NAME	6208	0.590181
20	OF_GENERIC_TYPE	5906	0.561471
21	RESOLVES_TO	5193	0.493687
22	SIMILAR	3977	0.378085
23	WRITES	3818	0.362969
24	CONTAINS	3814	0.362589
25	RETURNS_GENERIC	3545	0.337016
26	ANNOTATED_BY	2810	0.267141
27	REQUIRES	2174	0.206678
28	HAS_FIRST_CHILD	2144	0.203826
29	HAS_LAST_CHILD	2144	0.203826

## 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)

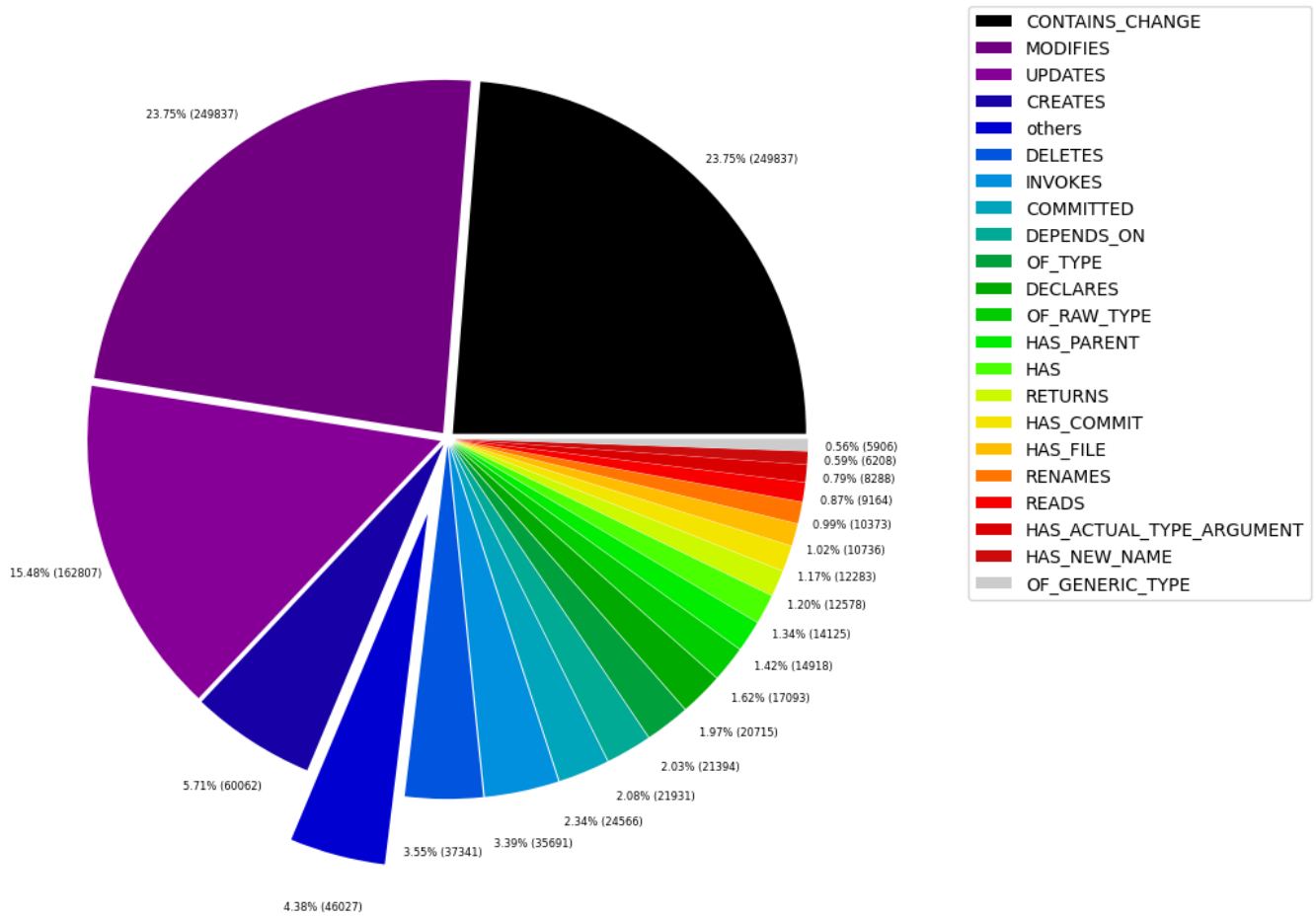


Table 2b - Lowest relationship count by type

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.

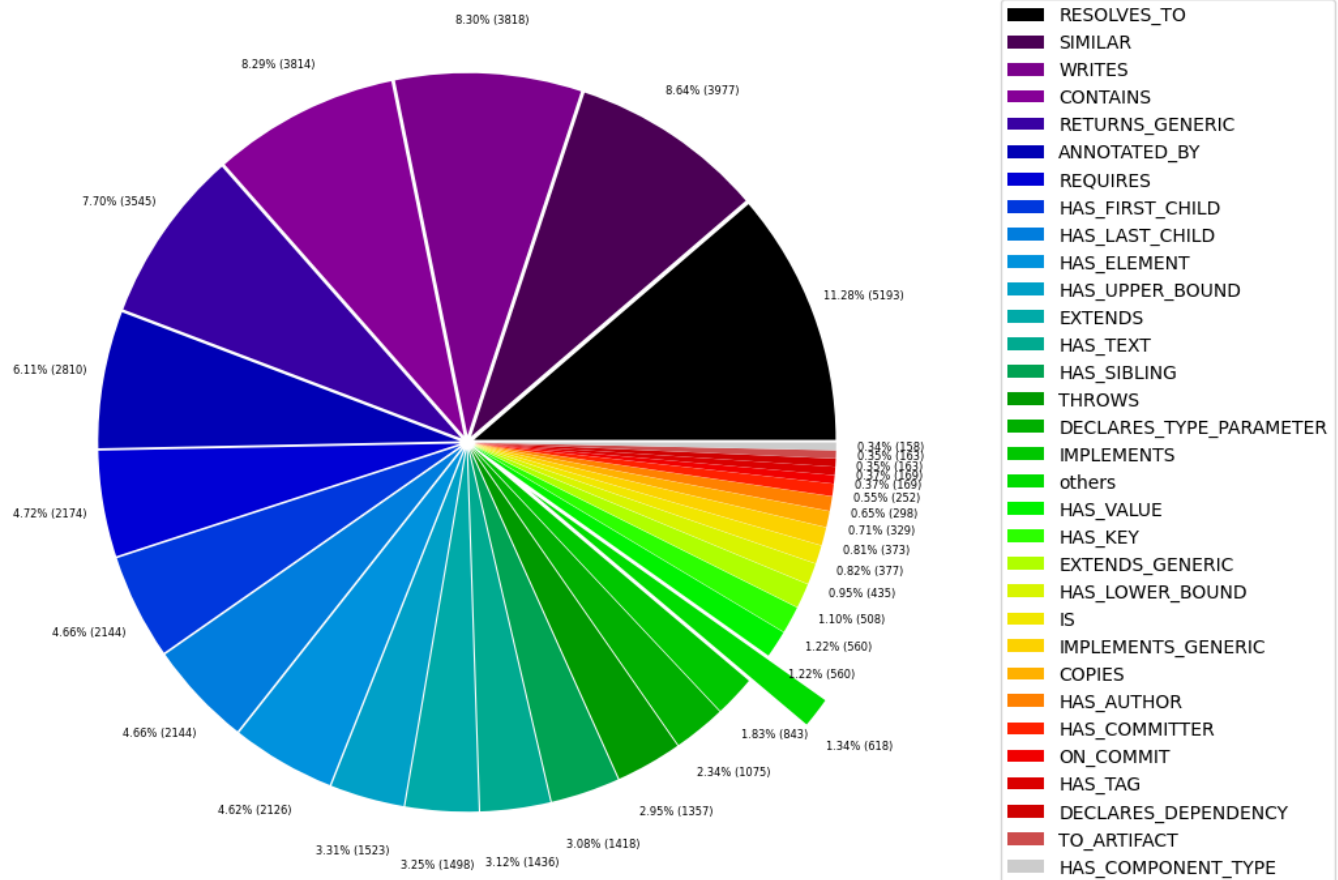
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000095
1	THROWS_GENERIC	5	0.000475
2	EXCLUDES	5	0.000475
3	DESCRIBES	9	0.000856
4	HAS_ROOT_ELEMENT	11	0.001046
5	HAS_GOAL	16	0.001521
6	HAS_EXECUTION	16	0.001521
7	OF_NAMESPACE	18	0.001711
8	HAS_ATTRIBUTE	18	0.001711
9	INCLUDES_CONCEPT	19	0.001806
10	USES_PLUGIN	21	0.001996
11	REQUIRES_TYPE_PARAMETER	21	0.001996
12	IS_ARTIFACT	21	0.001996
13	HAS_CONFIGURATION	21	0.001996
14	REQUIRES_CONCEPT	28	0.002662
15	HAS_BRANCH	34	0.003232
16	HAS_HEAD	35	0.003327
17	DECLARES_NAMESPACE	36	0.003422
18	HAS_DEFAULT	36	0.003422
19	CONTAINS_VALUE	121	0.011503
20	COPY_OF	126	0.011979
21	HAS_COMPONENT_TYPE	158	0.015021
22	TO_ARTIFACT	163	0.015496
23	DECLARES_DEPENDENCY	163	0.015496
24	ON_COMMIT	169	0.016066
25	HAS_TAG	169	0.016066
26	HAS_COMMITTER	252	0.023957
27	HAS_AUTHOR	298	0.028330
28	COPIES	329	0.031277
29	IMPLEMENTS_GENERIC	373	0.035460

## 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]	21805		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]	8360		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]	5109		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		2050
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		2050
28	[Type, File, Java, ByteCode, Class, GenericDec...	DECLARES	[Java, ByteCode, Member, Method]	2116		231
29	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2091		13106

## Graph Density

```
total_number_of_nodes (vertices): 338845
total_number_of_relationships (edges): 1051880
-> total directed graph density: 9.161473215819983e-06
-> total directed graph density in percent: 0.0009161473215819983
```