

# 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]	249184	73.714571
1	[Java, ByteCode, Member, Method]	13202	3.905467
2	[Java, ByteCode, Parameter]	13016	3.850443
3	[Git, Commit]	12219	3.614672
4	[File, Git]	10696	3.164132
5	[Java, ByteCode, ParameterizedType, Bound]	7172	2.121649
6	[Java, ByteCode, Bound]	7113	2.104195
7	[Java, ByteCode, Member, Field]	3503	1.036271
8	[Java, ByteCode, Bound, WildcardType]	2908	0.860256
9	[Java, Value, ByteCode, Annotation]	2822	0.834815
10	[Xml, Element]	2144	0.634246
11	[Java, ByteCode, Member, Constructor, Method]	2042	0.604072
12	[Xml, Text]	1436	0.424803
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.324223
14	[Java, ByteCode, Member, Method, Lambda]	938	0.277483
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	900	0.266241
16	[Type, File, Java, ByteCode, Class]	861	0.254704
17	[Type, File, Java, ByteCode, JavaType]	748	0.221276
18	[Java, Value, ByteCode, Primitive]	650	0.192286
19	[Java, ByteCode, Member, Method, GenericDeclar...	569	0.168324
20	[Json, Key]	560	0.165661
21	[Value, Json, Scalar]	544	0.160928
22	[Type, File, Java, ByteCode, ExternalType]	396	0.117146
23	[Author, Git, Person]	295	0.087268
24	[Value, Array]	267	0.078985
25	[Committer, Git, Person]	250	0.073956
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.069814
27	[Value, Property]	202	0.059756
28	[Type, File, Java, ByteCode, Interface]	187	0.055319
29	[Java, Value, ByteCode, Class]	172	0.050882

## 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)

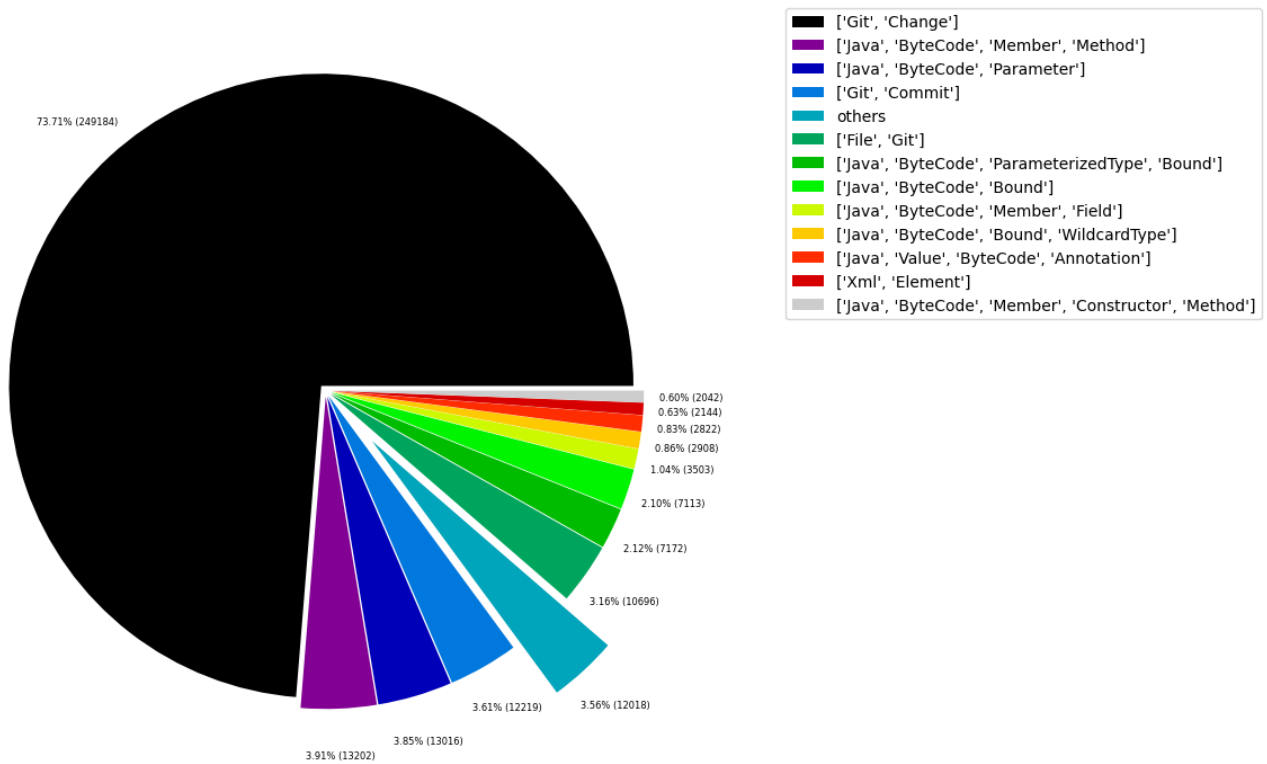


Table 1b - Lowest node count by label combination

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	0.000296
1	[Repository, File, Git]	1	0.000296
2	[File, Json]	2	0.000592
3	[File]	3	0.000887
4	[Java, ByteCode, Member, Constructor, Method, ...]	4	0.001183
5	[Maven, Exclusion]	5	0.001479
6	[Value, Json, Array]	6	0.001775
7	[File, Maven, Xml, Pom, Document]	9	0.002662
8	[Type, File, Java, ByteCode, Void]	9	0.002662
9	[Java, ManifestSection]	9	0.002662
10	[File, Java, Manifest]	9	0.002662
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002662
12	[File, Java, ServiceLoader]	10	0.002958
13	[File, Java, Properties]	12	0.003550
14	[Maven, ExecutionGoal]	16	0.004733
15	[Maven, PluginExecution]	16	0.004733
16	[Xml, Attribute]	18	0.005325
17	[jQAssistant, Rule, Concept]	19	0.005621
18	[Maven, Plugin]	21	0.006212
19	[Maven, Configuration]	21	0.006212
20	[Type, File, Java, ByteCode, Enum]	28	0.008283
21	[Git, Branch]	29	0.008579
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008579
23	[Xml, Namespace]	36	0.010650
24	[Type, File, Java, ByteCode, Annotation]	43	0.012720
25	[File, Directory]	44	0.013016
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.025145
27	[Artifact, Maven]	92	0.027216
28	[Type, File, Java, ByteCode, ExternalAnnotatio...	93	0.027512
29	[Value, ManifestEntry]	120	0.035499

## 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)

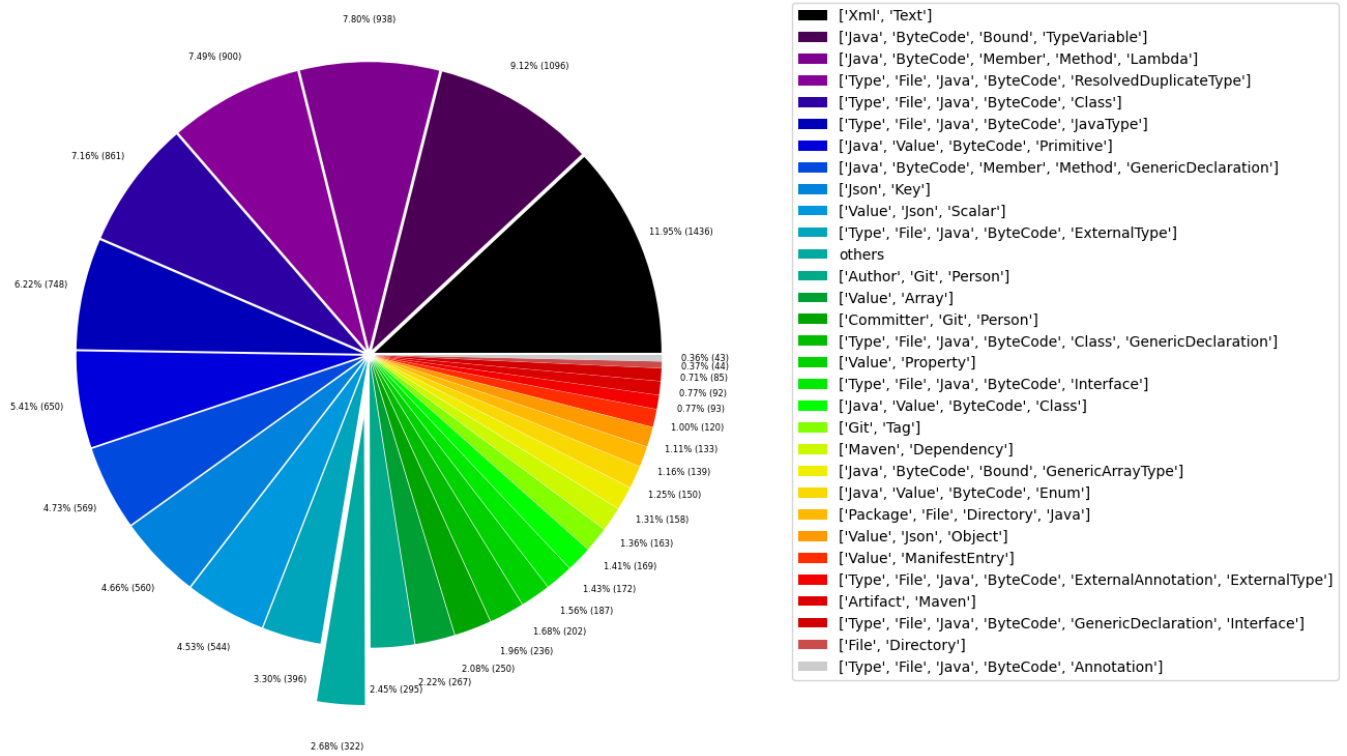


Table 1c - Highest node count by single label

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.

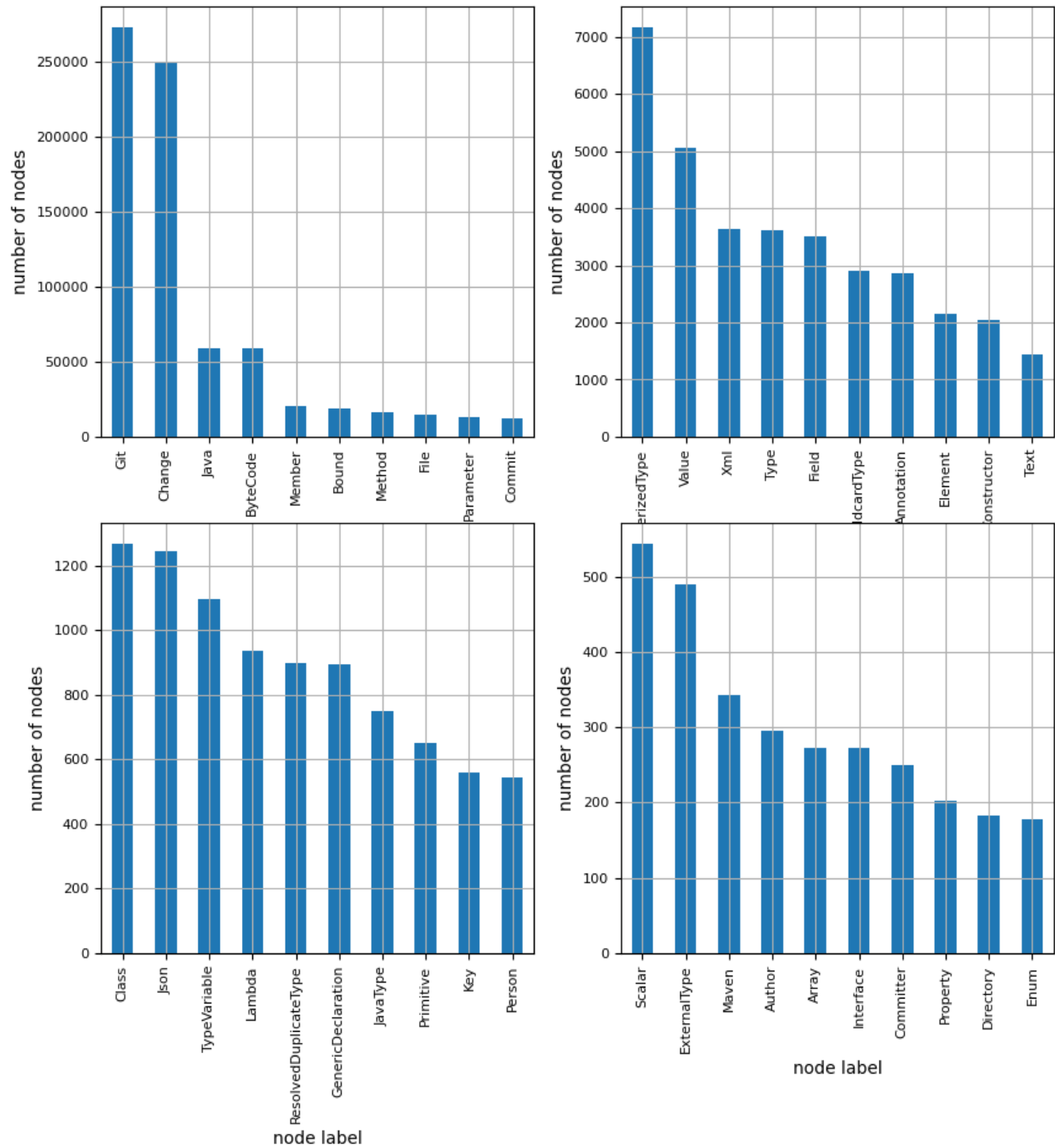
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	272843	80.713468
1	Change	249184	73.714571
2	Java	59318	17.547679
3	ByteCode	59130	17.492065
4	Member	20258	5.992800
5	Bound	18447	5.457063
6	Method	16755	4.956529
7	File	14549	4.303941
8	Parameter	13016	3.850443
9	Commit	12219	3.614672
10	ParameterizedType	7172	2.121649
11	Value	5066	1.498644
12	Xml	3643	1.077686
13	Type	3615	1.069403
14	Field	3503	1.036271
15	WildcardType	2908	0.860256
16	Annotation	2865	0.847535
17	Element	2144	0.634246
18	Constructor	2046	0.605256
19	Text	1436	0.424803
20	Class	1269	0.375400
21	Json	1245	0.368301
22	TypeVariable	1096	0.324223
23	Lambda	938	0.277483
24	ResolvedDuplicateType	900	0.266241
25	GenericDeclaration	894	0.264467
26	JavaType	748	0.221276
27	Primitive	650	0.192286
28	Key	560	0.165661
29	Person	545	0.161224
30	Scalar	544	0.160928
31	ExternalType	489	0.144658
32	Maven	343	0.101468
33	Author	295	0.087268
34	Array	273	0.080760
35	Interface	272	0.080464
36	Committer	250	0.073956
37	Property	202	0.059756
38	Directory	183	0.054136
39	Enum	178	0.052657

## 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: 1048509

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	249184	23.765557
1	MODIFIES	249184	23.765557
2	UPDATES	162457	15.494097
3	CREATES	59784	5.701811
4	DELETES	37233	3.551042
5	INVOKES	35679	3.402832
6	COMMITTED	24438	2.330738
7	DEPENDS_ON	21887	2.087440
8	OF_TYPE	21373	2.038418
9	DECLARES	20699	1.974137
10	OF_RAW_TYPE	17084	1.629361
11	HAS_PARENT	14849	1.416201
12	HAS	14110	1.345720
13	RETURNS	12562	1.198082
14	HAS_COMMIT	12219	1.165369
15	HAS_FILE	10696	1.020115
16	RENAMES	10290	0.981394
17	READS	9097	0.867613
18	HAS_ACTUAL_TYPE_ARGUMENT	8284	0.790074
19	HAS_NEW_NAME	6199	0.591220
20	OF_GENERIC_TYPE	5903	0.562990
21	RESOLVES_TO	5205	0.496419
22	SIMILAR	3968	0.378442
23	WRITES	3812	0.363564
24	CONTAINS	3806	0.362992
25	RETURNS_GENERIC	3543	0.337908
26	ANNOTATED_BY	2810	0.268000
27	REQUIRES	2175	0.207437
28	HAS_FIRST_CHILD	2144	0.204481
29	HAS_LAST_CHILD	2144	0.204481

## 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)

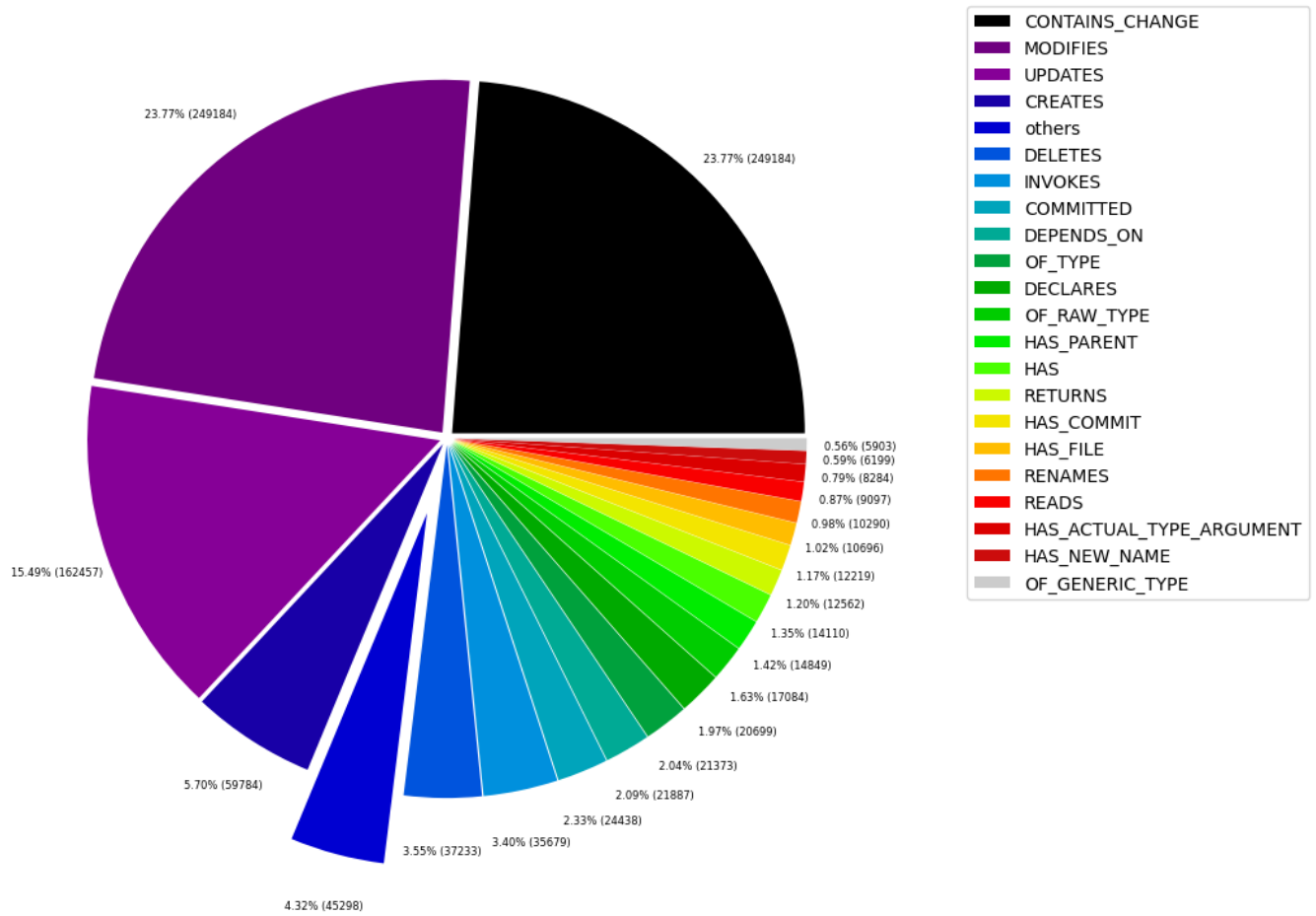


Table 2b - Lowest relationship count by type

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.

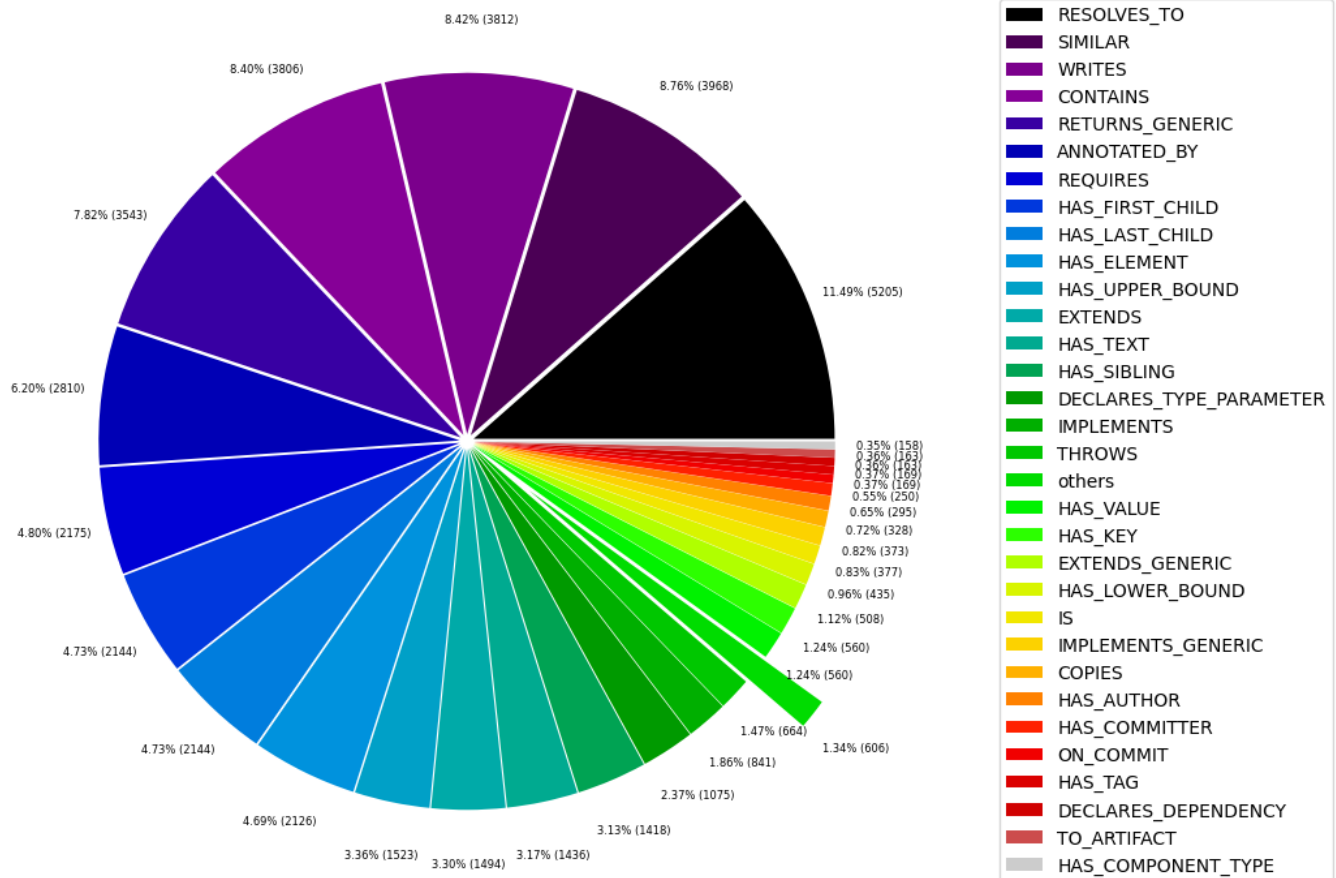
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000095
1	THROWS_GENERIC	5	0.000477
2	EXCLUDES	5	0.000477
3	HAS_ROOT_ELEMENT	9	0.000858
4	DESCRIBES	9	0.000858
5	HAS_GOAL	16	0.001526
6	HAS_EXECUTION	16	0.001526
7	OF_NAMESPACE	18	0.001717
8	HAS_ATTRIBUTE	18	0.001717
9	INCLUDES_CONCEPT	19	0.001812
10	USES_PLUGIN	21	0.002003
11	REQUIRES_TYPE_PARAMETER	21	0.002003
12	IS_ARTIFACT	21	0.002003
13	HAS_CONFIGURATION	21	0.002003
14	REQUIRES_CONCEPT	28	0.002670
15	HAS_BRANCH	29	0.002766
16	HAS_HEAD	30	0.002861
17	DECLARES_NAMESPACE	36	0.003433
18	HAS_DEFAULT	36	0.003433
19	CONTAINS_VALUE	121	0.011540
20	COPY_OF	126	0.012017
21	HAS_COMPONENT_TYPE	158	0.015069
22	TO_ARTIFACT	163	0.015546
23	DECLARES_DEPENDENCY	163	0.015546
24	ON_COMMIT	169	0.016118
25	HAS_TAG	169	0.016118
26	HAS_COMMITTER	250	0.023843
27	HAS_AUTHOR	295	0.028135
28	COPIES	328	0.031283
29	IMPLEMENTS_GENERIC	373	0.035574

## 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]	249184		12219
1	[Git, Change]	MODIFIES	[File, Git]	249184		249184
2	[Git, Change]	UPDATES	[File, Git]	162457		249184
3	[Git, Change]	CREATES	[File, Git]	59784		249184
4	[Git, Change]	DELETES	[File, Git]	37233		249184
5	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Method]	21566		13077
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14840		12219
7	[Repository, File, Git]	HAS_COMMIT	[Git, Commit]	12219		1
8	[Author, Git, Person]	COMMITTED	[Git, Commit]	12219		295
9	[Committer, Git, Person]	COMMITTED	[Git, Commit]	12219		250
10	[Repository, File, Git]	HAS_FILE	[File, Git]	10696		1
11	[Git, Change]	RENAMES	[File, Git]	10290		249184
12	[Java, ByteCode, Member, Method]	HAS	[Java, ByteCode, Parameter]	8320		13077
13	[Java, ByteCode, Member, Method]	READS	[Java, ByteCode, Member, Field]	8124		13077
14	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6368		13016
15	[File, Git]	HAS_NEW_NAME	[File, Git]	6199		10696
16	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3570		7113
17	[Java, ByteCode, ParameterizedType, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3049		7172
18	[Java, ByteCode, ParameterizedType, Bound]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2908		7172
19	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, ParameterizedType, Bound]	2655		13016
20	[Java, ByteCode, ParameterizedType, Bound]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2454		7172
21	[Java, ByteCode, Member, Constructor, Method]	WRITES	[Java, ByteCode, Member, Field]	2432		2042
22	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalAnnotatio...	2341		2822
23	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126		2144
24	[Java, ByteCode, Member, Constructor, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2113		2042
25	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2089		13077
26	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2030		13077
27	[Java, ByteCode, Member, Constructor, Method]	HAS	[Java, ByteCode, Parameter]	2023		2042
28	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2023		13016
29	[Java, ByteCode, Member, Method, Lambda]	INVOKES	[Java, ByteCode, Member, Method]	1879		938

## Graph Density

```
total_number_of_nodes (vertices): 338039
total_number_of_relationships (edges): 1048509
-> total directed graph density: 9.17571320410475e-06
-> total directed graph density in percent: 0.000917571320410475
```