

# 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]	245374	73.478689
1	[Java, ByteCode, Method, Member]	13205	3.954315
2	[Java, ByteCode, Parameter]	13000	3.892927
3	[Git, Commit]	12007	3.595567
4	[File, Git]	10675	3.196692
5	[Java, ByteCode, Bound, ParameterizedType]	7166	2.145901
6	[Java, ByteCode, Bound]	7112	2.129730
7	[Java, ByteCode, Member, Field]	3495	1.046598
8	[Java, ByteCode, Bound, WildcardType]	2906	0.870219
9	[Java, Value, ByteCode, Annotation]	2821	0.844765
10	[Xml, Element]	2144	0.642033
11	[Java, ByteCode, Constructor, Method, Member]	2041	0.611189
12	[Xml, Text]	1436	0.430019
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.328204
14	[Java, ByteCode, Method, Member, Lambda]	936	0.280291
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	900	0.269510
16	[Type, File, Java, ByteCode, Class]	861	0.257832
17	[Type, File, Java, ByteCode, JavaType]	746	0.223394
18	[Java, Value, ByteCode, Primitive]	650	0.194646
19	[Java, ByteCode, Method, Member, GenericDeclar...	569	0.170390
20	[Json, Key]	555	0.166198
21	[Value, Json, Scalar]	539	0.161407
22	[Type, File, Java, ByteCode, ExternalType]	396	0.118585
23	[Author, Git, Person]	292	0.087441
24	[Value, Array]	267	0.079955
25	[Committer, Git, Person]	247	0.073966
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.070672
27	[Value, Property]	202	0.060490
28	[Type, File, Java, ByteCode, Interface]	187	0.055998
29	[Java, Value, ByteCode, Class]	172	0.051506

## 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)

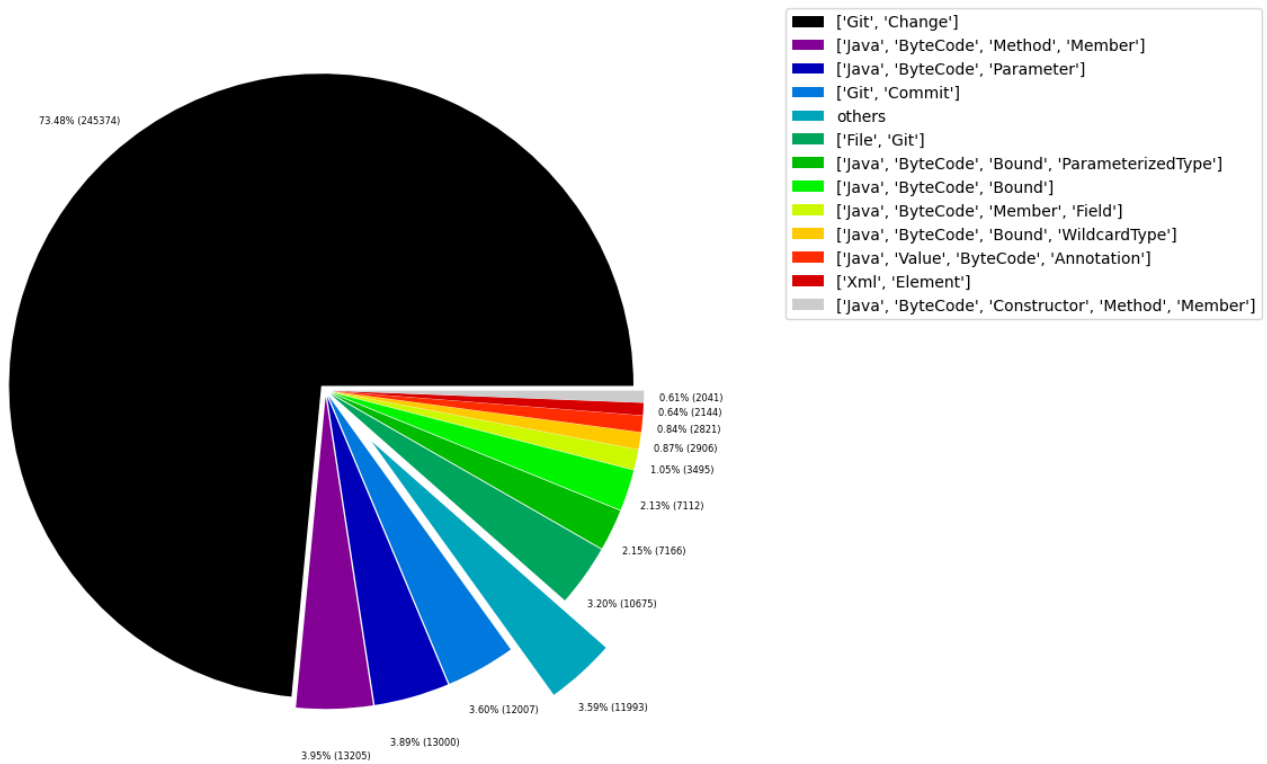


Table 1b - Lowest node count by label combination

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	0.000299
1	[File, Json]	2	0.000599
2	[File]	3	0.000898
3	[Java, ByteCode, Constructor, Method, Member, ...]	4	0.001198
4	[Maven, Exclusion]	5	0.001497
5	[Value, Array, Json]	6	0.001797
6	[File, Xml, Maven, Pom, Document]	9	0.002695
7	[Type, File, Java, ByteCode, Void]	9	0.002695
8	[Java, ManifestSection]	9	0.002695
9	[File, Java, Manifest]	9	0.002695
10	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002695
11	[File, Java, ServiceLoader]	10	0.002995
12	[File, Java, Properties]	12	0.003593
13	[Maven, ExecutionGoal]	16	0.004791
14	[Maven, PluginExecution]	16	0.004791
15	[Xml, Attribute]	18	0.005390
16	[jQAssistant, Rule, Concept]	19	0.005690
17	[Maven, Plugin]	21	0.006289
18	[Maven, Configuration]	21	0.006289
19	[Git, Branch]	28	0.008385
20	[Type, File, Java, ByteCode, Enum]	28	0.008385
21	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008684
22	[Xml, Namespace]	36	0.010780
23	[Type, File, Java, ByteCode, Annotation]	43	0.012877
24	[File, Directory]	44	0.013176
25	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.025454
26	[Artifact, Maven]	92	0.027550
27	[Type, File, Java, ByteCode, ExternalType, Ext...	93	0.027849
28	[Value, ManifestEntry]	120	0.035935
29	[Value, Json, Object]	132	0.039528

## 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)

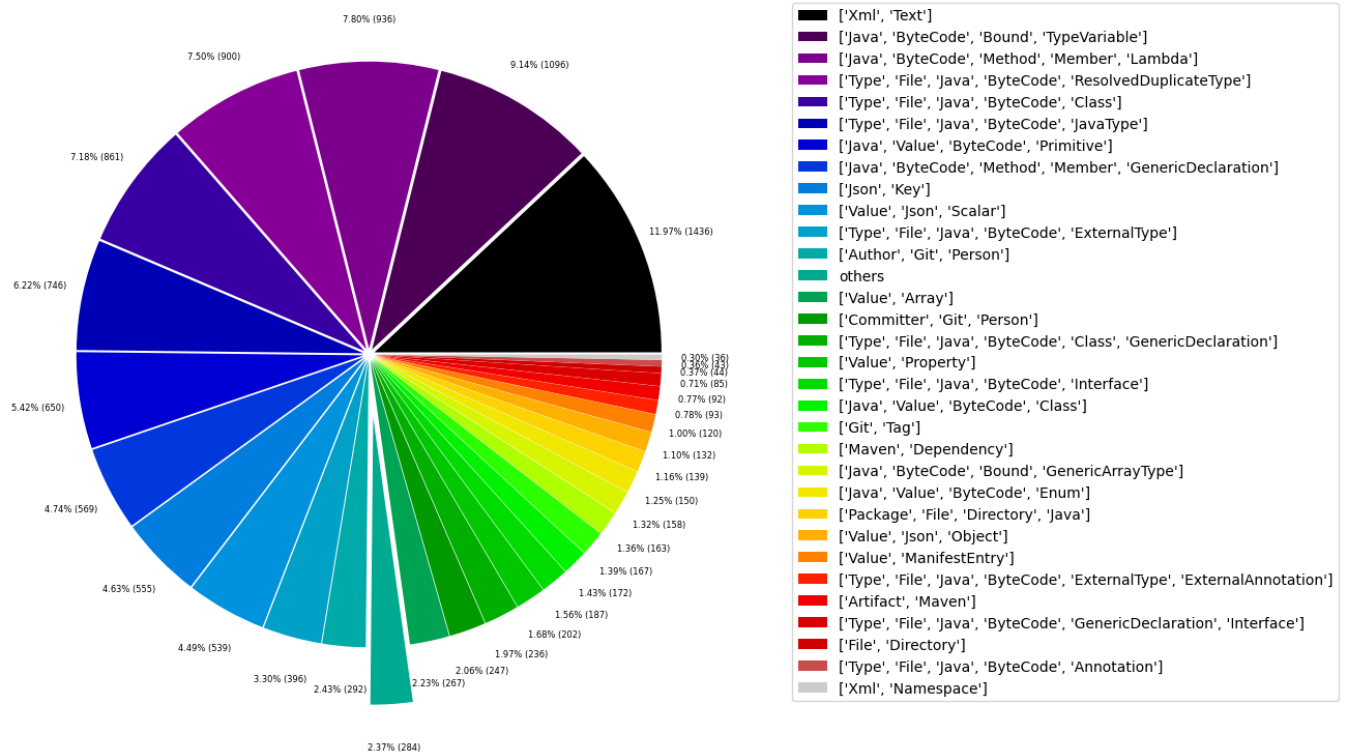


Table 1c - Highest node count by single label

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.

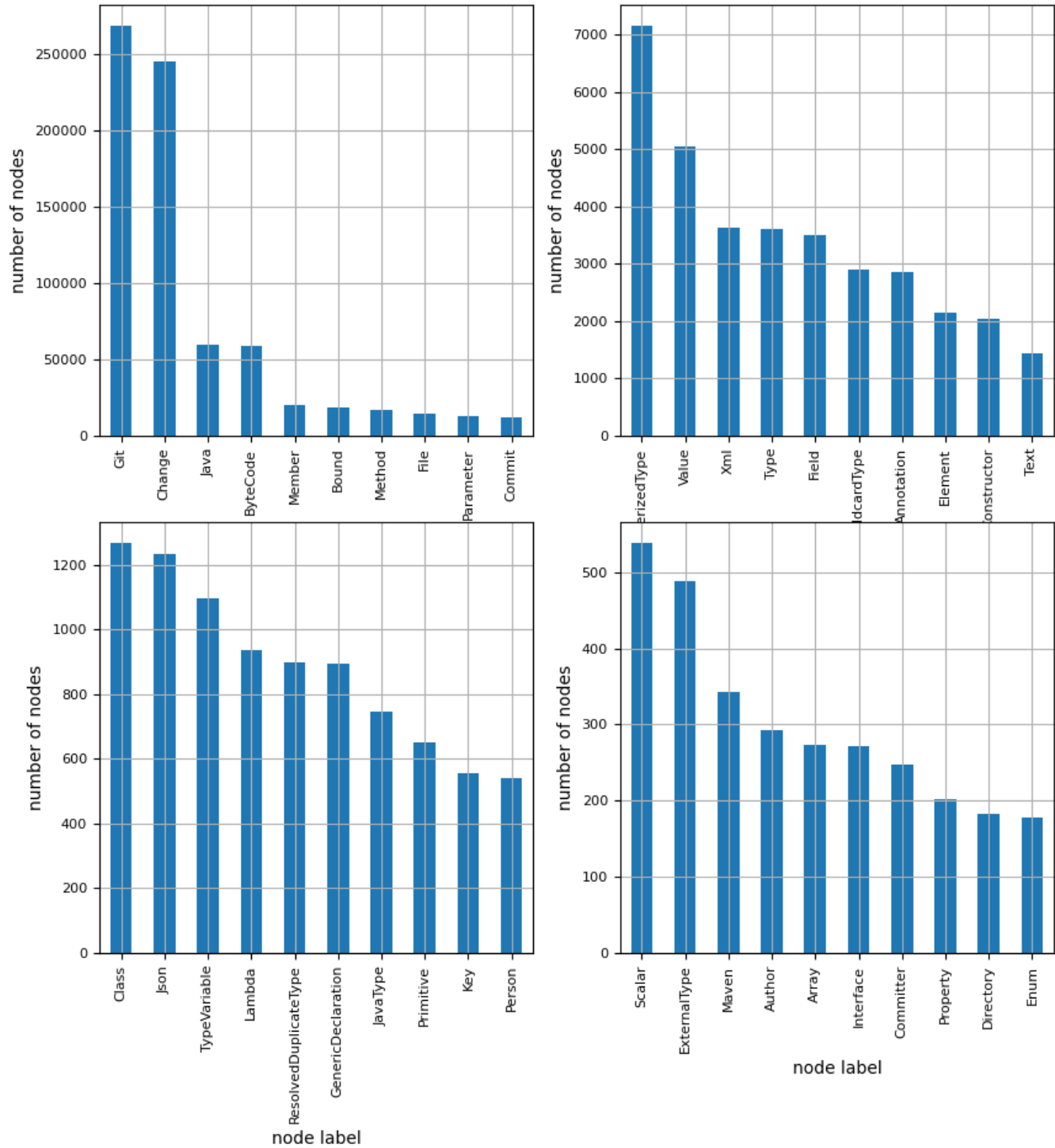
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	268790	80.490748
1	Change	245374	73.478689
2	Java	59282	17.752344
3	ByteCode	59094	17.696046
4	Member	20250	6.063982
5	Bound	18438	5.521368
6	Method	16755	5.017383
7	File	14525	4.349597
8	Parameter	13000	3.892927
9	Commit	12007	3.595567
10	ParameterizedType	7166	2.145901
11	Value	5059	1.514947
12	Xml	3643	1.090918
13	Type	3613	1.081934
14	Field	3495	1.046598
15	WildcardType	2906	0.870219
16	Annotation	2864	0.857642
17	Element	2144	0.642033
18	Constructor	2045	0.612387
19	Text	1436	0.430019
20	Class	1269	0.380010
21	Json	1234	0.369529
22	TypeVariable	1096	0.328204
23	Lambda	936	0.280291
24	ResolvedDuplicateType	900	0.269510
25	GenericDeclaration	894	0.267714
26	JavaType	746	0.223394
27	Primitive	650	0.194646
28	Key	555	0.166198
29	Person	539	0.161407
30	Scalar	539	0.161407
31	ExternalType	489	0.146434
32	Maven	343	0.102713
33	Author	292	0.087441
34	Array	273	0.081751
35	Interface	272	0.081452
36	Committer	247	0.073966
37	Property	202	0.060490
38	Directory	183	0.054800
39	Enum	178	0.053303

## 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: 1012523

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	245374	24.233919
1	MODIFIES	245374	24.233919
2	UPDATES	158754	15.679051
3	CREATES	59716	5.897743
4	DELETES	37193	3.673299
5	INVOKES	35576	3.513599
6	COMMITTED	24014	2.371699
7	DEPENDS_ON	21873	2.160247
8	OF_TYPE	21347	2.108298
9	DECLARES	20691	2.043509
10	OF_RAW_TYPE	17077	1.686579
11	HAS_PARENT	14602	1.442140
12	HAS	14094	1.391968
13	RETURNS	12547	1.239182
14	RENAMES	10289	1.016174
15	READS	9078	0.896572
16	HAS_ACTUAL_TYPE_ARGUMENT	8276	0.817364
17	HAS_NEW_NAME	6198	0.612134
18	OF_GENERIC_TYPE	5902	0.582900
19	RESOLVES_TO	5228	0.516334
20	SIMILAR	3968	0.391892
21	CONTAINS	3805	0.375794
22	WRITES	3803	0.375596
23	RETURNS_GENERIC	3543	0.349918
24	ANNOTATED_BY	2809	0.277426
25	REQUIRES	2173	0.214612
26	HAS_FIRST_CHILD	2144	0.211748
27	HAS_LAST_CHILD	2144	0.211748
28	HAS_ELEMENT	2126	0.209971
29	HAS_UPPER_BOUND	1521	0.150219

## 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)

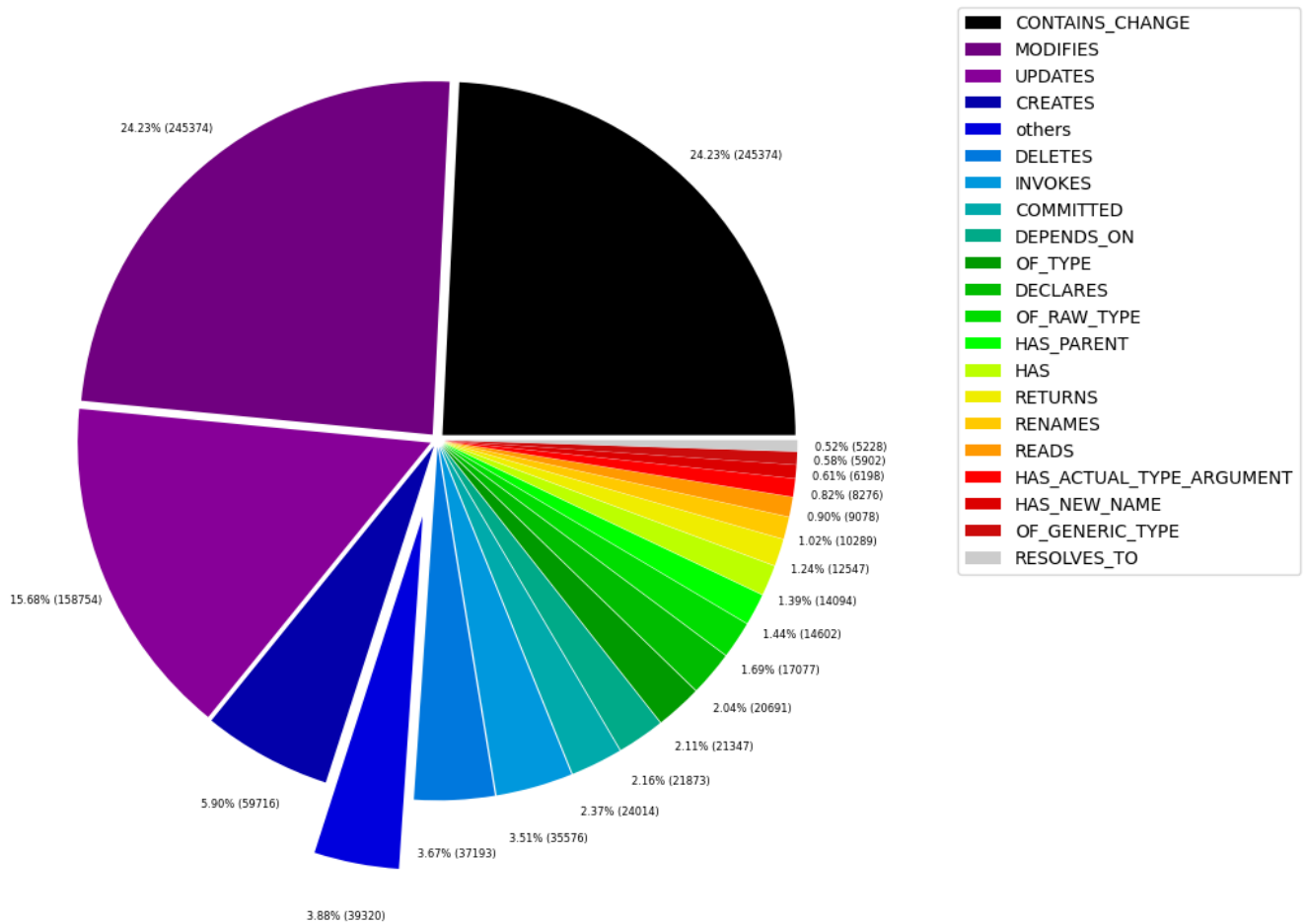


Table 2b - Lowest relationship count by type

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.

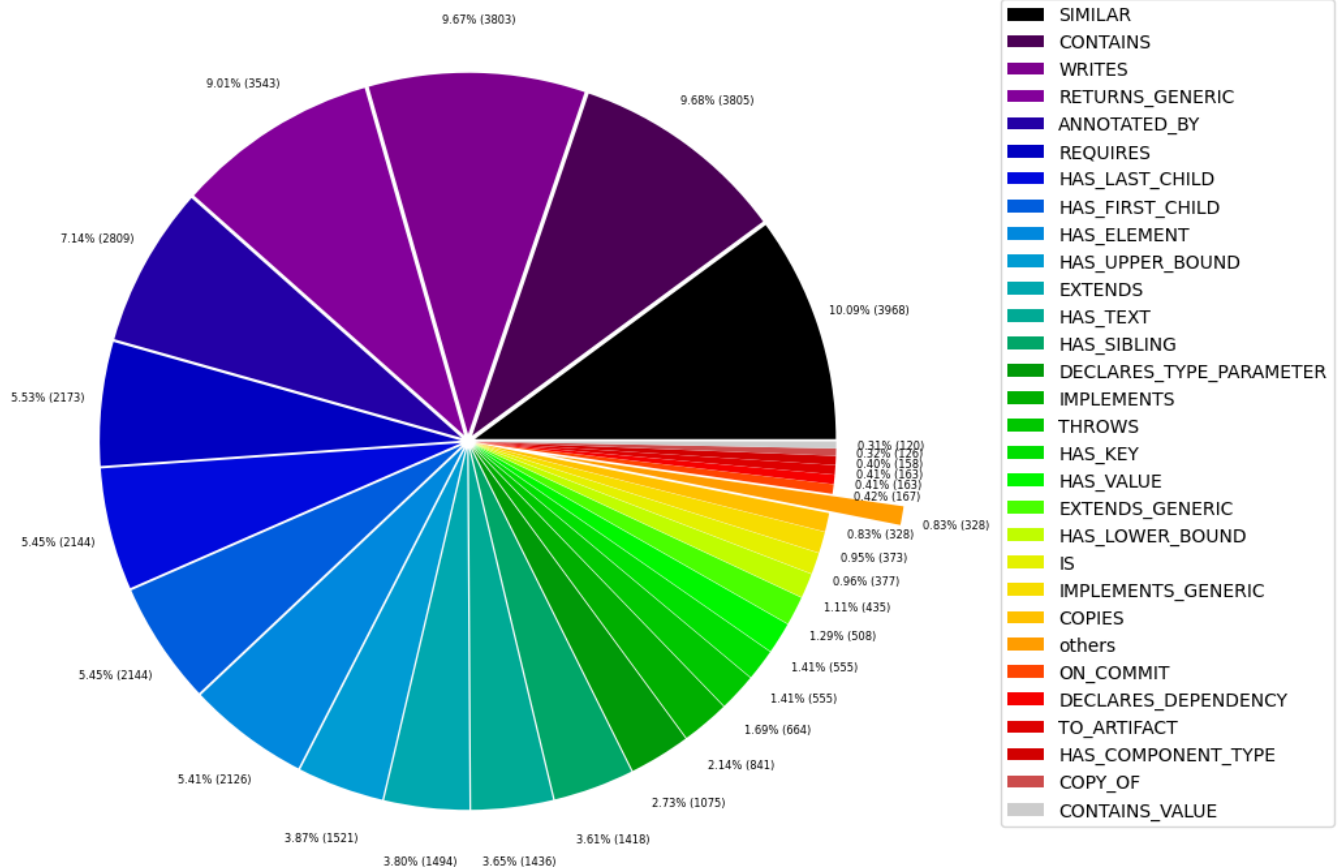
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000099
1	THROWS_GENERIC	5	0.000494
2	EXCLUDES	5	0.000494
3	HAS_ROOT_ELEMENT	9	0.000889
4	DESCRIBES	9	0.000889
5	HAS_GOAL	16	0.001580
6	HAS_EXECUTION	16	0.001580
7	OF_NAMESPACE	18	0.001778
8	HAS_ATTRIBUTE	18	0.001778
9	INCLUDES_CONCEPT	19	0.001877
10	USES_PLUGIN	21	0.002074
11	REQUIRES_TYPE_PARAMETER	21	0.002074
12	IS_ARTIFACT	21	0.002074
13	HAS_CONFIGURATION	21	0.002074
14	REQUIRES_CONCEPT	28	0.002765
15	HAS_HEAD	28	0.002765
16	DECLARES_NAMESPACE	36	0.003555
17	HAS_DEFAULT	36	0.003555
18	CONTAINS_VALUE	120	0.011852
19	COPY_OF	126	0.012444
20	HAS_COMPONENT_TYPE	158	0.015605
21	TO_ARTIFACT	163	0.016098
22	DECLARES_DEPENDENCY	163	0.016098
23	ON_COMMIT	167	0.016493
24	COPIES	328	0.032394
25	IMPLEMENTS_GENERIC	373	0.036839
26	IS	377	0.037234
27	HAS_LOWER_BOUND	435	0.042962
28	EXTENDS_GENERIC	508	0.050172
29	HAS_VALUE	555	0.054814

## 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]	245374		12007
1	[Git, Change]	MODIFIES	[File, Git]	245374		245374
2	[Git, Change]	UPDATES	[File, Git]	158754		245374
3	[Git, Change]	CREATES	[File, Git]	59716		245374
4	[Git, Change]	DELETES	[File, Git]	37193		245374
5	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	21523		13081
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14593		12007
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	12007		292
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	12007		247
9	[Git, Change]	RENAMES	[File, Git]	10289		245374
10	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	8297		13081
11	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	8100		13081
12	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6360		13000
13	[File, Git]	HAS_NEW_NAME	[File, Git]	6198		10675
14	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3569		7112
15	[Java, ByteCode, Bound, ParameterizedType]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3043		7166
16	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2906		7166
17	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound, ParameterizedType]	2655		13000
18	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2454		7166
19	[Java, ByteCode, Constructor, Method, Member]	WRITES	[Java, ByteCode, Member, Field]	2426		2041
20	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalType, Ext...	2340		2821
21	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126		2144
22	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2111		2041
23	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2088		13081
24	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	2023		2041
25	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2023		13000
26	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2007		13081
27	[Java, ByteCode, Method, Member, Lambda]	INVOKES	[Java, ByteCode, Method, Member]	1883		936
28	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound]	1802		7166
29	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	1796		2041

## Graph Density

```
total_number_of_nodes (vertices): 333939
total_number_of_relationships (edges): 1012523
-> total directed graph density: 9.079708650824115e-06
-> total directed graph density in percent: 0.0009079708650824115
```