

# 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]	242552	73.262614
1	[Java, ByteCode, Method, Member]	13200	3.987048
2	[Java, ByteCode, Parameter]	13000	3.926638
3	[Git, Commit]	11970	3.615528
4	[File, Git]	10671	3.223166
5	[Java, ByteCode, Bound, ParameterizedType]	7166	2.164484
6	[Java, ByteCode, Bound]	7112	2.148173
7	[Java, ByteCode, Member, Field]	3494	1.055360
8	[Java, ByteCode, Bound, WildcardType]	2906	0.877755
9	[Java, Value, ByteCode, Annotation]	2821	0.852081
10	[Xml, Element]	2144	0.647593
11	[Java, ByteCode, Constructor, Method, Member]	2042	0.616784
12	[Xml, Text]	1436	0.433743
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.331046
14	[Java, ByteCode, Method, Member, Lambda]	936	0.282718
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	900	0.271844
16	[Type, File, Java, ByteCode, Class]	861	0.260064
17	[Type, File, Java, ByteCode, JavaType]	746	0.225329
18	[Java, Value, ByteCode, Primitive]	650	0.196332
19	[Java, ByteCode, Method, Member, GenericDeclar...	569	0.171866
20	[Json, Key]	555	0.167637
21	[Value, Json, Scalar]	539	0.162804
22	[Type, File, Java, ByteCode, ExternalType]	396	0.119611
23	[Author, Git, Person]	292	0.088198
24	[Value, Array]	267	0.080647
25	[Committer, Git, Person]	247	0.074606
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.071284
27	[Value, Property]	202	0.061014
28	[Type, File, Java, ByteCode, Interface]	187	0.056483
29	[Java, Value, ByteCode, Class]	172	0.051952

## 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)

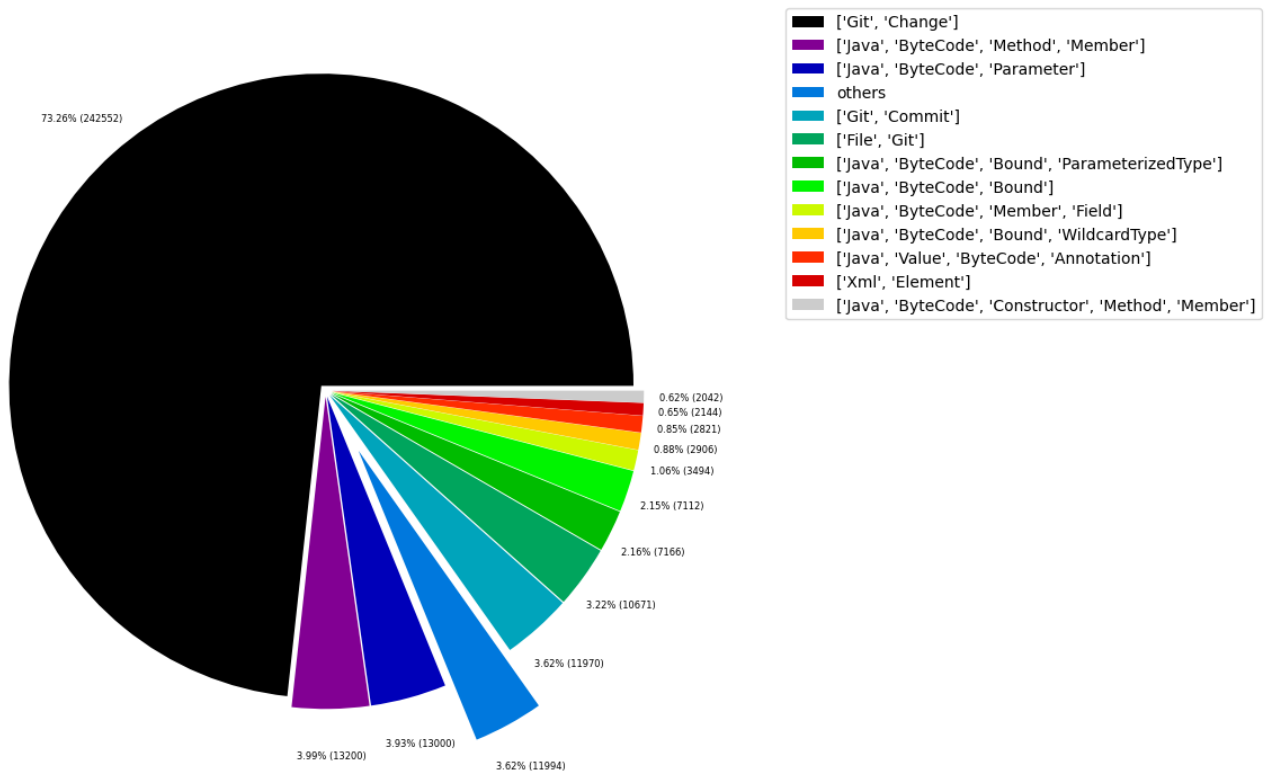


Table 1b - Lowest node count by label combination

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	0.000302
1	[File, Json]	2	0.000604
2	[File]	3	0.000906
3	[Java, ByteCode, Constructor, Method, Member, ...]	4	0.001208
4	[Maven, Exclusion]	5	0.001510
5	[Value, Array, Json]	6	0.001812
6	[File, Maven, Xml, Pom, Document]	9	0.002718
7	[Type, File, Java, ByteCode, Void]	9	0.002718
8	[Java, ManifestSection]	9	0.002718
9	[File, Java, Manifest]	9	0.002718
10	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002718
11	[File, Java, ServiceLoader]	10	0.003020
12	[File, Java, Properties]	12	0.003625
13	[Maven, ExecutionGoal]	16	0.004833
14	[Maven, PluginExecution]	16	0.004833
15	[Xml, Attribute]	18	0.005437
16	[jQAssistant, Rule, Concept]	19	0.005739
17	[Maven, Plugin]	21	0.006343
18	[Maven, Configuration]	21	0.006343
19	[Type, File, Java, ByteCode, Enum]	28	0.008457
20	[Git, Branch]	29	0.008759
21	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008759
22	[Xml, Namespace]	36	0.010874
23	[Type, File, Java, ByteCode, Annotation]	43	0.012988
24	[File, Directory]	44	0.013290
25	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.025674
26	[Artifact, Maven]	92	0.027789
27	[Type, File, Java, ByteCode, ExternalType, Ext...	93	0.028091
28	[Value, ManifestEntry]	120	0.036246
29	[Value, Json, Object]	132	0.039870

## 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)

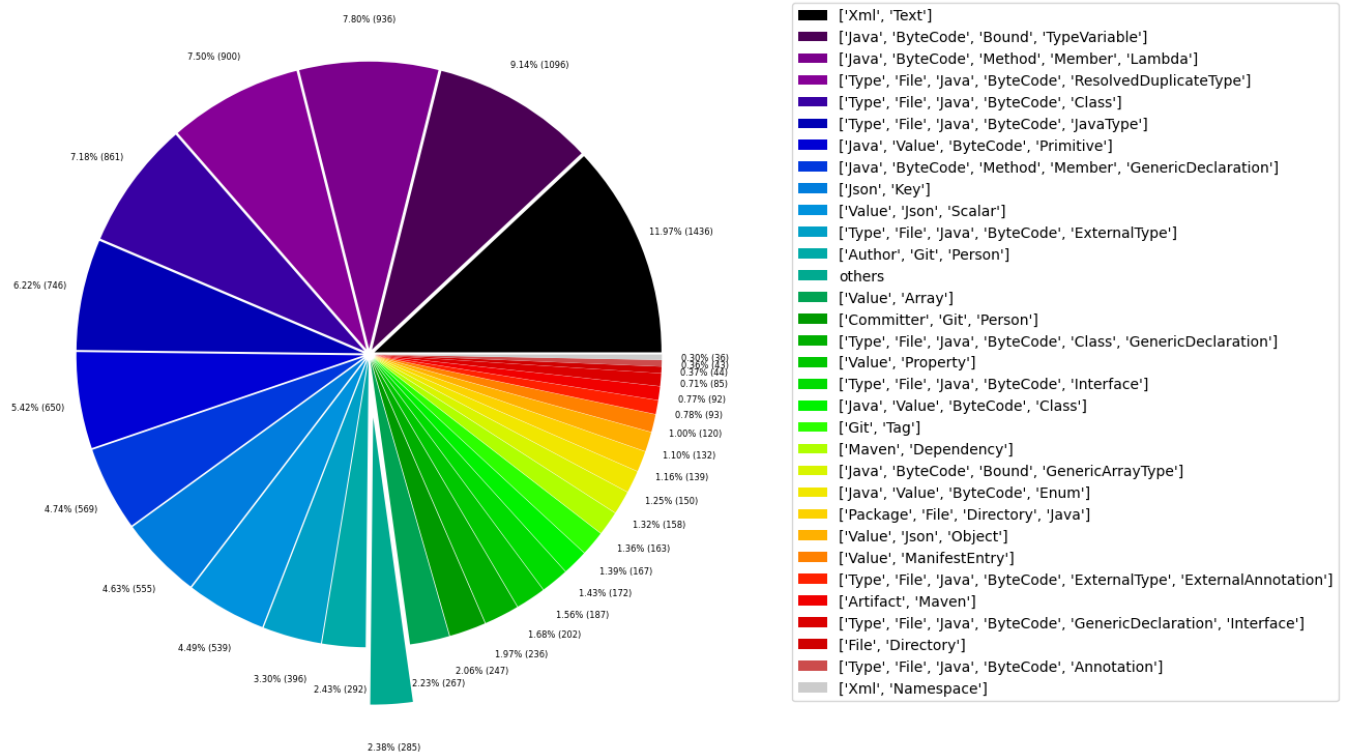


Table 1c - Highest node count by single label

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.

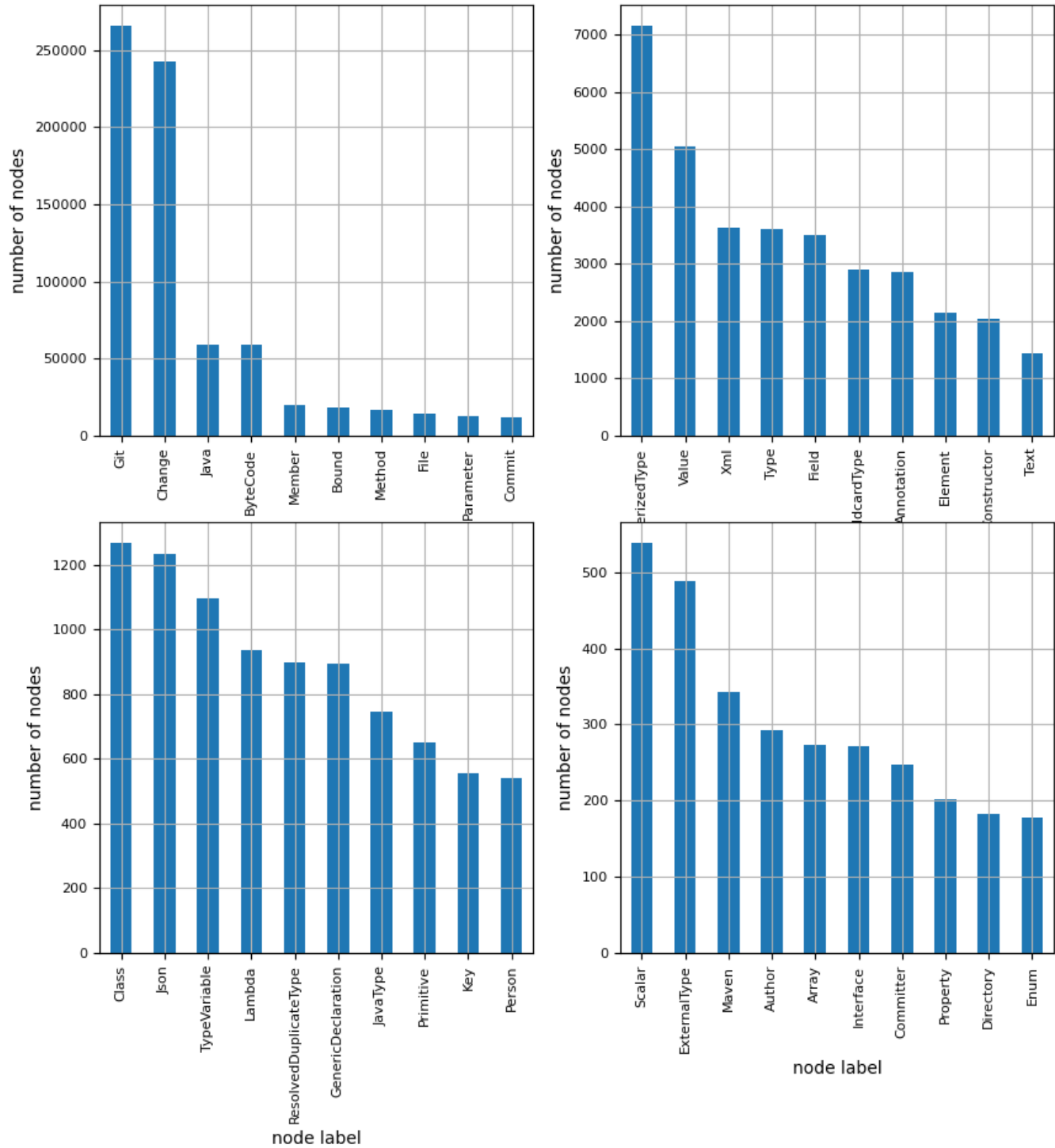
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	265928	80.323313
1	Change	242552	73.262614
2	Java	59277	17.904565
3	ByteCode	59089	17.847779
4	Member	20245	6.114984
5	Bound	18438	5.569181
6	Method	16751	5.059624
7	File	14521	4.386055
8	Parameter	13000	3.926638
9	Commit	11970	3.615528
10	ParameterizedType	7166	2.164484
11	Value	5059	1.528066
12	Xml	3643	1.100365
13	Type	3613	1.091303
14	Field	3494	1.055360
15	WildcardType	2906	0.877755
16	Annotation	2864	0.865069
17	Element	2144	0.647593
18	Constructor	2046	0.617992
19	Text	1436	0.433743
20	Class	1269	0.383300
21	Json	1234	0.372729
22	TypeVariable	1096	0.331046
23	Lambda	936	0.282718
24	ResolvedDuplicateType	900	0.271844
25	GenericDeclaration	894	0.270032
26	JavaType	746	0.225329
27	Primitive	650	0.196332
28	Key	555	0.167637
29	Person	539	0.162804
30	Scalar	539	0.162804
31	ExternalType	489	0.147702
32	Maven	343	0.103603
33	Author	292	0.088198
34	Array	273	0.082459
35	Interface	272	0.082157
36	Committer	247	0.074606
37	Property	202	0.061014
38	Directory	183	0.055275
39	Enum	178	0.053765

## 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: 1003692

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	242552	24.165979
1	MODIFIES	242552	24.165979
2	UPDATES	156734	15.615747
3	CREATES	59224	5.900615
4	DELETES	36771	3.663574
5	INVOKES	35571	3.544015
6	COMMITTED	23940	2.385194
7	DEPENDS_ON	21873	2.179254
8	OF_TYPE	21347	2.126848
9	DECLARES	20686	2.060991
10	OF_RAW_TYPE	17077	1.701418
11	HAS_PARENT	14555	1.450146
12	HAS	14094	1.404216
13	RETURNS	12547	1.250085
14	RENAMES	10177	1.013956
15	READS	9076	0.904261
16	HAS_ACTUAL_TYPE_ARGUMENT	8276	0.824556
17	HAS_NEW_NAME	6196	0.617321
18	OF_GENERIC_TYPE	5902	0.588029
19	RESOLVES_TO	5223	0.520379
20	SIMILAR	3968	0.395340
21	CONTAINS	3805	0.379100
22	WRITES	3803	0.378901
23	RETURNS_GENERIC	3543	0.352997
24	ANNOTATED_BY	2809	0.279867
25	REQUIRES	2173	0.216501
26	HAS_FIRST_CHILD	2144	0.213611
27	HAS_LAST_CHILD	2144	0.213611
28	HAS_ELEMENT	2126	0.211818
29	HAS_UPPER_BOUND	1521	0.151541

## 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)

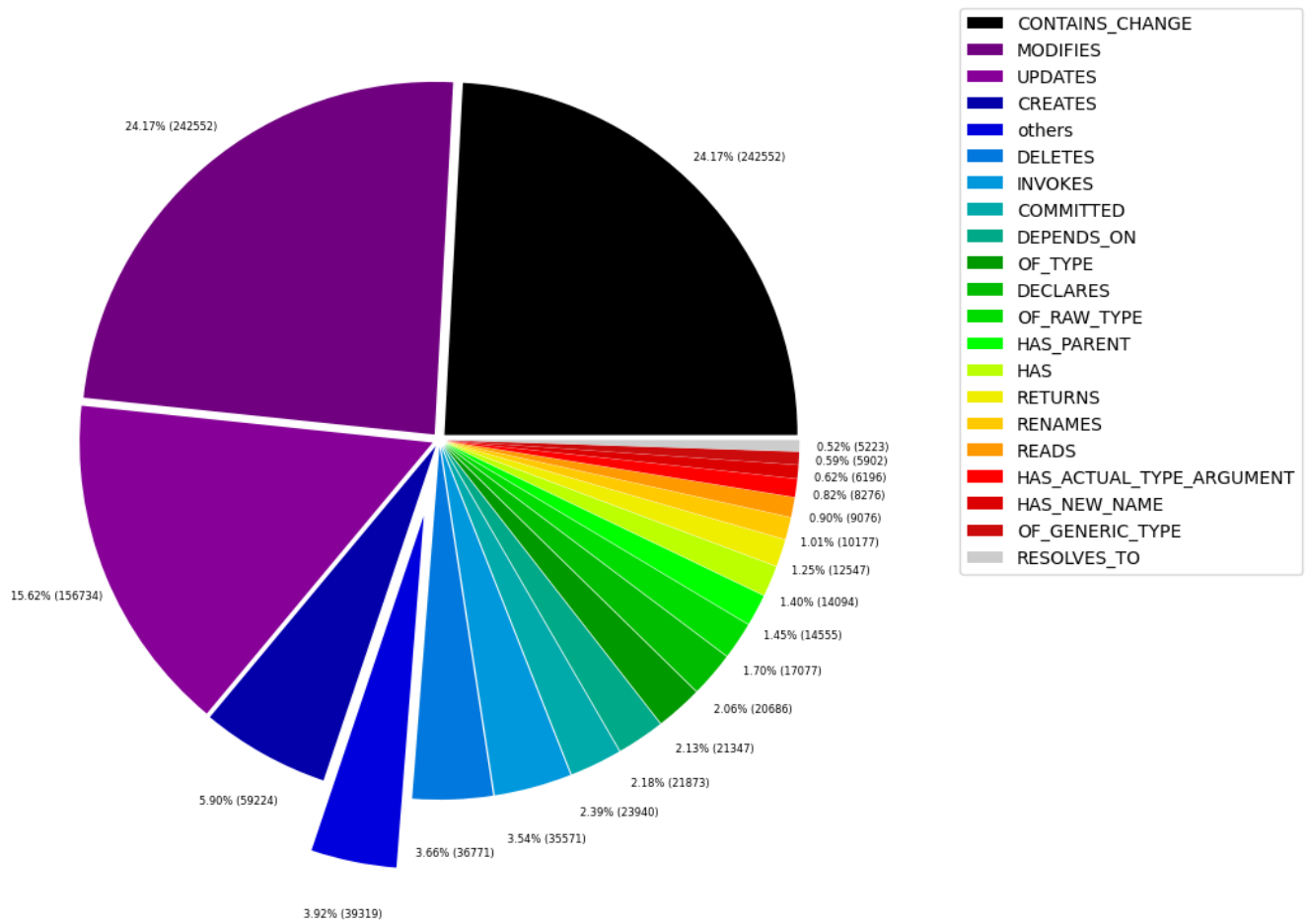


Table 2b - Lowest relationship count by type

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.

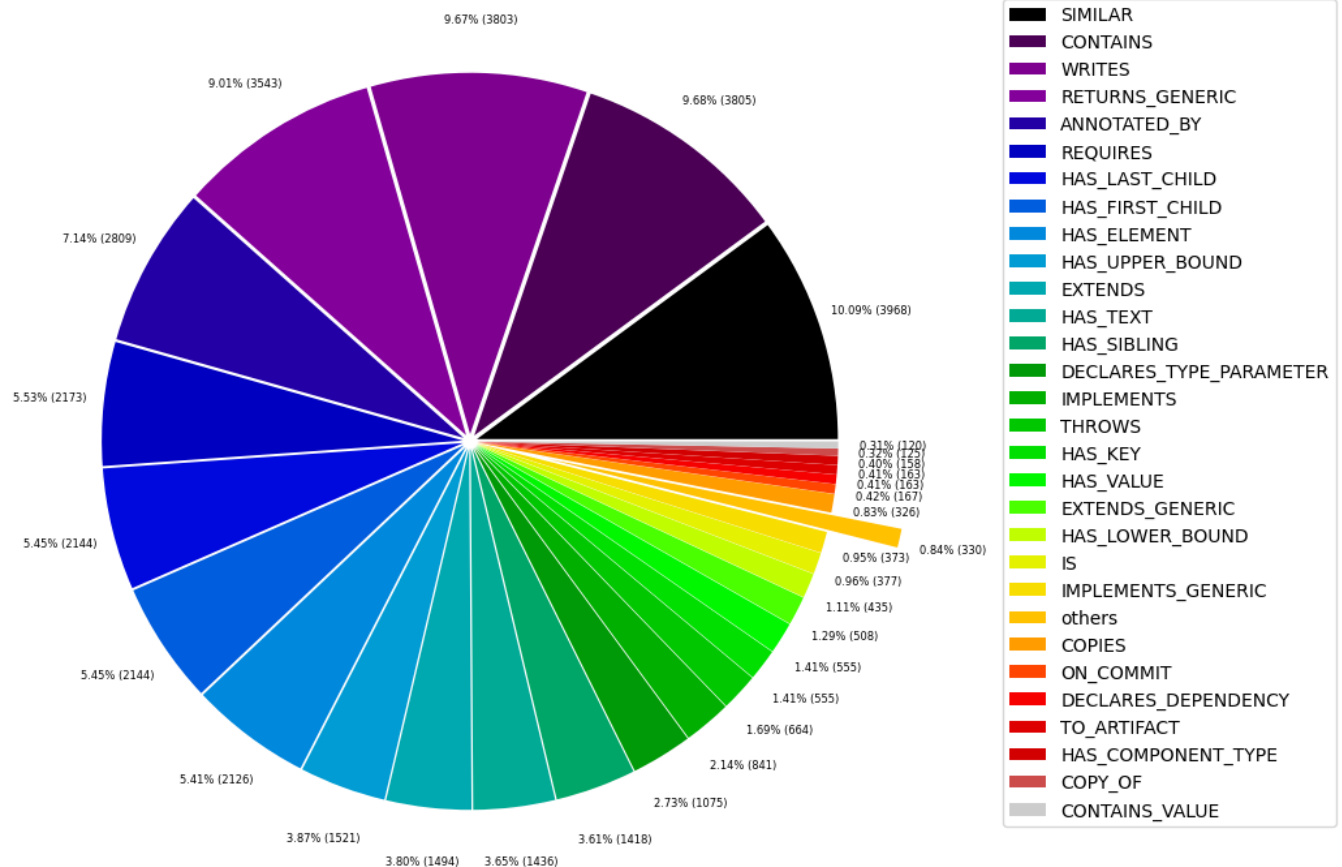
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000100
1	THROWS_GENERIC	5	0.000498
2	EXCLUDES	5	0.000498
3	DESCRIBES	9	0.000897
4	HAS_ROOT_ELEMENT	10	0.000996
5	HAS_GOAL	16	0.001594
6	HAS_EXECUTION	16	0.001594
7	OF_NAMESPACE	18	0.001793
8	HAS_ATTRIBUTE	18	0.001793
9	INCLUDES_CONCEPT	19	0.001893
10	USES_PLUGIN	21	0.002092
11	REQUIRES_TYPE_PARAMETER	21	0.002092
12	IS_ARTIFACT	21	0.002092
13	HAS_CONFIGURATION	21	0.002092
14	REQUIRES_CONCEPT	28	0.002790
15	HAS_HEAD	29	0.002889
16	DECLARES_NAMESPACE	36	0.003587
17	HAS_DEFAULT	36	0.003587
18	CONTAINS_VALUE	120	0.011956
19	COPY_OF	125	0.012454
20	HAS_COMPONENT_TYPE	158	0.015742
21	TO_ARTIFACT	163	0.016240
22	DECLARES_DEPENDENCY	163	0.016240
23	ON_COMMIT	167	0.016639
24	COPIES	326	0.032480
25	IMPLEMENTS_GENERIC	373	0.037163
26	IS	377	0.037561
27	HAS_LOWER_BOUND	435	0.043340
28	EXTENDS_GENERIC	508	0.050613
29	HAS_VALUE	555	0.055296

## 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]	242552		11970
1	[Git, Change]	MODIFIES	[File, Git]	242552		242552
2	[Git, Change]	UPDATES	[File, Git]	156734		242552
3	[Git, Change]	CREATES	[File, Git]	59224		242552
4	[Git, Change]	DELETES	[File, Git]	36771		242552
5	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	21518		13076
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14546		11970
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11970		292
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11970		247
9	[Git, Change]	RENAMES	[File, Git]	10177		242552
10	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	8297		13076
11	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	8100		13076
12	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6360		13000
13	[File, Git]	HAS_NEW_NAME	[File, Git]	6196		10671
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		2042
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		2042
23	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2088		13076
24	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	2023		2042
25	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2023		13000
26	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2007		13076
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		2042

## Graph Density

```
total_number_of_nodes (vertices): 331072
total_number_of_relationships (edges): 1003692
-> total directed graph density: 9.157077073592772e-06
-> total directed graph density in percent: 0.0009157077073592771
```