

# 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`.

Total number of nodes: 321653

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	233534	72.604328
1	[Java, ByteCode, Member, Method]	13204	4.105045
2	[Java, ByteCode, Parameter]	12968	4.031674
3	[Git, Commit]	11748	3.652383
4	[File, Git]	10593	3.293301
5	[Java, ByteCode, Bound, ParameterizedType]	7154	2.224136
6	[Java, ByteCode, Bound]	7094	2.205482
7	[Java, ByteCode, Member, Field]	3490	1.085020
8	[Java, ByteCode, Bound, WildcardType]	2902	0.902214
9	[Java, Value, ByteCode, Annotation]	2813	0.874545
10	[Xml, Element]	2144	0.666557
11	[Java, ByteCode, Member, Constructor, Method]	2045	0.635778
12	[Xml, Text]	1436	0.446444
13	[Java, ByteCode, Bound, TypeVariable]	1094	0.340118
14	[Java, ByteCode, Member, Method, Lambda]	931	0.289442
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	899	0.279494
16	[Type, File, Java, Class, ByteCode]	858	0.266747
17	[Type, File, Java, ByteCode, JavaType]	746	0.231927
18	[Java, Value, ByteCode, Primitive]	647	0.201148
19	[Java, ByteCode, Member, Method, GenericDeclar...	567	0.176277
20	[Json, Key]	555	0.172546
21	[Value, Json, Scalar]	539	0.167572
22	[Type, File, Java, ByteCode, ExternalType]	396	0.123114
23	[Author, Git, Person]	289	0.089848
24	[Value, Array]	267	0.083009
25	[Committer, Git, Person]	243	0.075547
26	[Type, File, Java, Class, ByteCode, GenericDec...	236	0.073371
27	[Value, Property]	202	0.062801
28	[Type, File, Java, ByteCode, Interface]	186	0.057826
29	[Java, Value, Class, ByteCode]	170	0.052852

## 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)

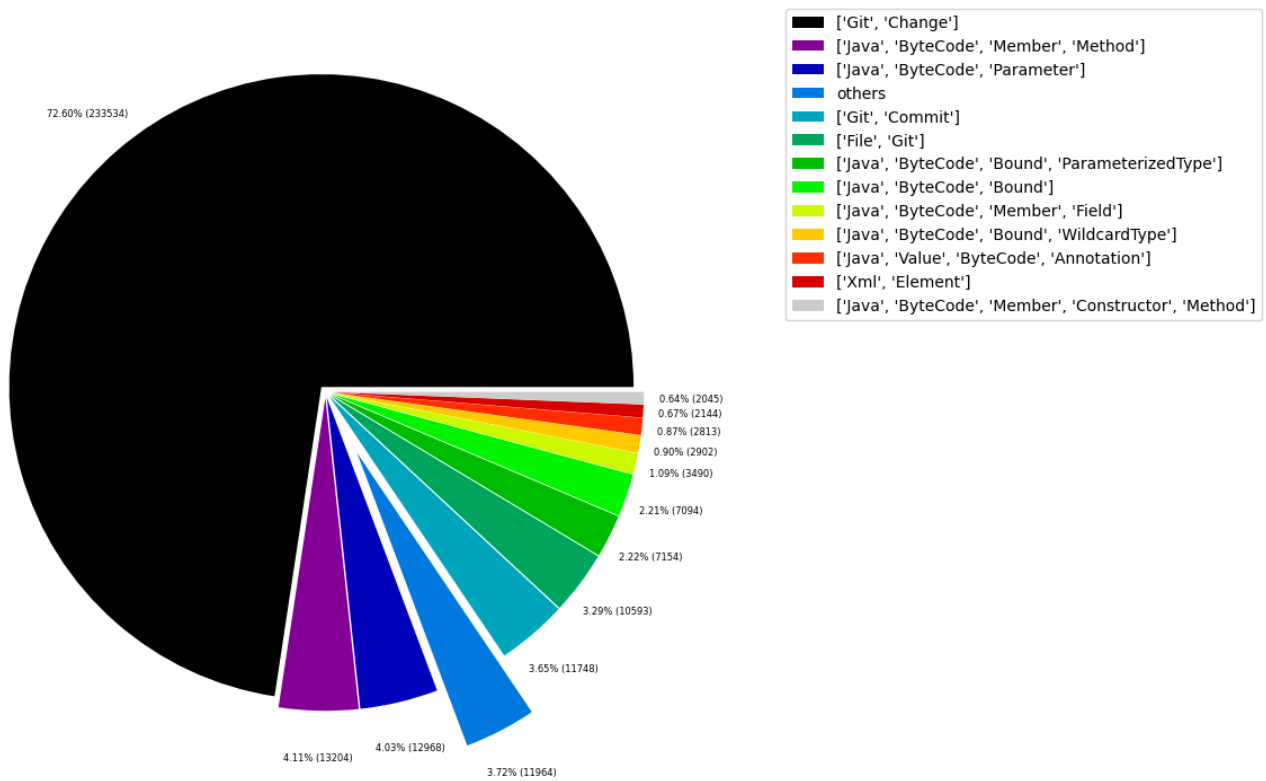


Table 1b - Lowest node count by label combination

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	0.000311
1	[File, TS, Scan]	1	0.000311
2	[File, Json]	2	0.000622
3	[File]	3	0.000933
4	[Java, ByteCode, Member, Constructor, Method, ...]	4	0.001244
5	[Maven, Exclusion]	5	0.001554
6	[Value, Array, Json]	6	0.001865
7	[Type, File, Java, ByteCode, Void]	9	0.002798
8	[File, Maven, Xml, Pom, Document]	9	0.002798
9	[Java, ManifestSection]	9	0.002798
10	[File, Java, Manifest]	9	0.002798
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002798
12	[File, Java, ServiceLoader]	10	0.003109
13	[File, Java, Properties]	12	0.003731
14	[Maven, ExecutionGoal]	16	0.004974
15	[Maven, PluginExecution]	16	0.004974
16	[Xml, Attribute]	18	0.005596
17	[jQAssistant, Rule, Concept]	19	0.005907
18	[Maven, Plugin]	21	0.006529
19	[Maven, Configuration]	21	0.006529
20	[Git, Branch]	26	0.008083
21	[Type, File, Java, ByteCode, Enum]	28	0.008705
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.009016
23	[Xml, Namespace]	36	0.011192
24	[Type, File, Java, ByteCode, Annotation]	43	0.013368
25	[File, Directory]	44	0.013679
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.026426
27	[Artifact, Maven]	92	0.028602
28	[Type, File, Java, ByteCode, ExternalAnnotatio...	93	0.028913
29	[Value, ManifestEntry]	120	0.037307

## 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)

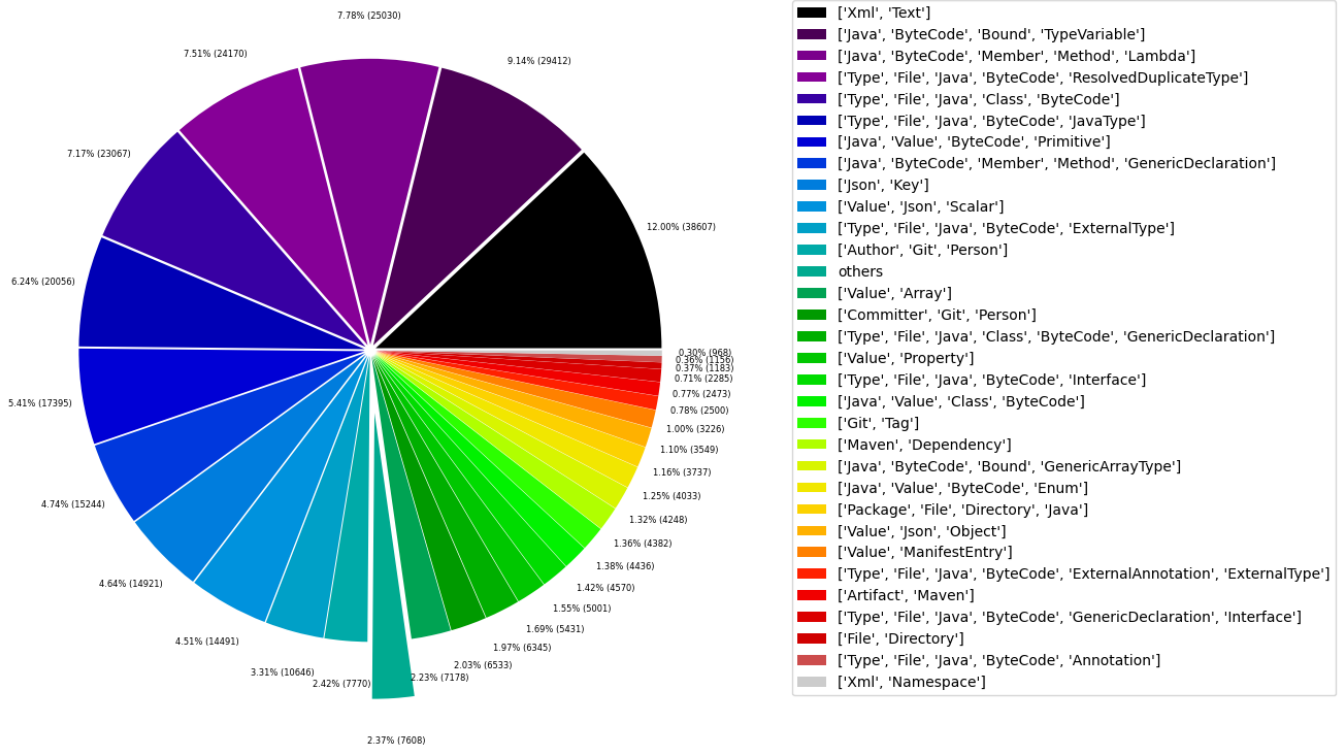


Table 1c - Highest node count by single label

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.

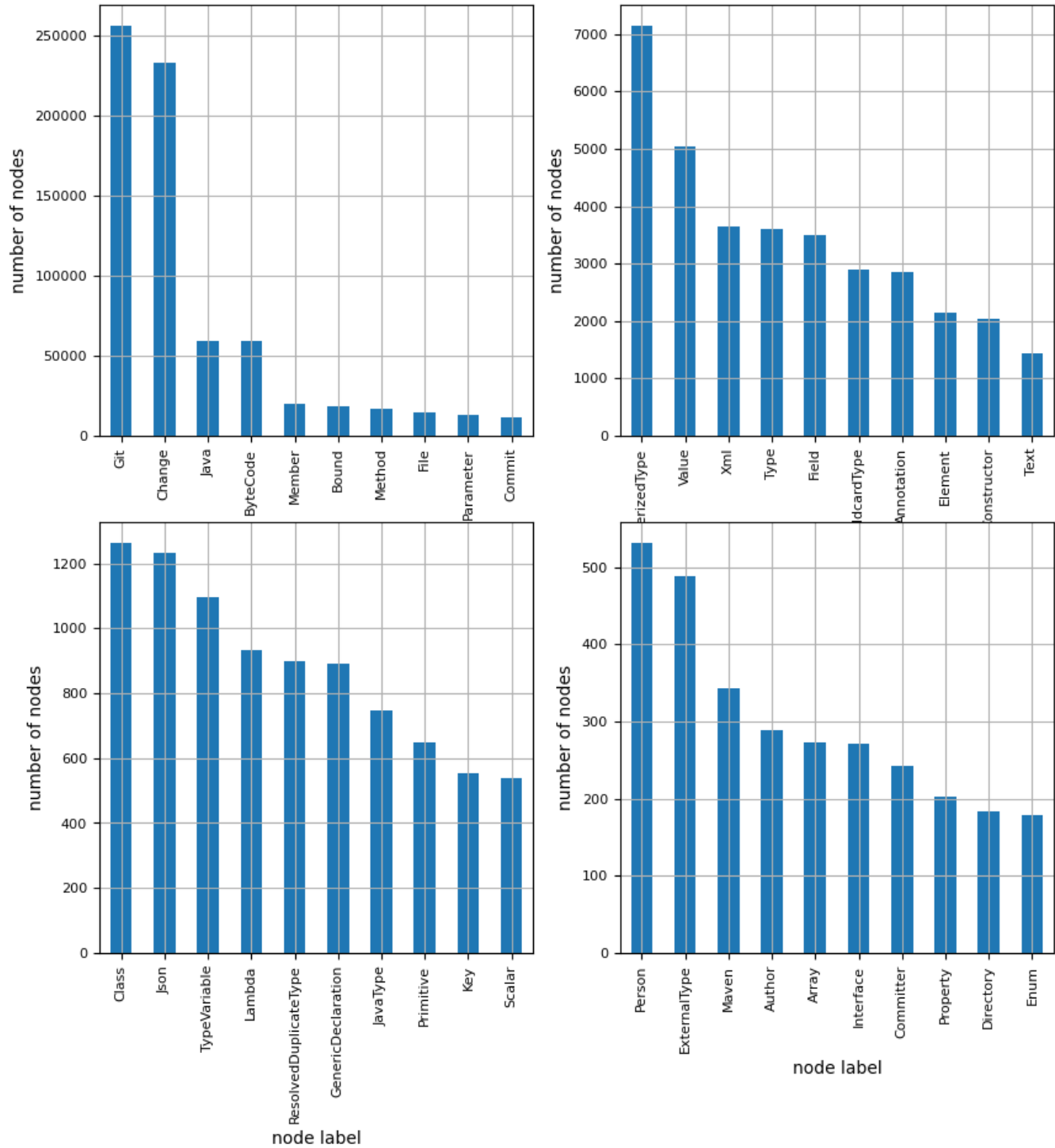
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	256598	79.774788
1	Change	233534	72.604328
2	Java	59187	18.400885
3	ByteCode	58999	18.342437
4	Member	20241	6.292806
5	Bound	18402	5.721072
6	Method	16751	5.207786
7	File	14439	4.488999
8	Parameter	12968	4.031674
9	Commit	11748	3.652383
10	ParameterizedType	7154	2.224136
11	Value	5046	1.568771
12	Xml	3643	1.132587
13	Type	3608	1.121706
14	Field	3490	1.085020
15	WildcardType	2902	0.902214
16	Annotation	2856	0.887913
17	Element	2144	0.666557
18	Constructor	2049	0.637022
19	Text	1436	0.446444
20	Class	1264	0.392970
21	Json	1234	0.383643
22	TypeVariable	1094	0.340118
23	Lambda	931	0.289442
24	ResolvedDuplicateType	899	0.279494
25	GenericDeclaration	892	0.277317
26	JavaType	746	0.231927
27	Primitive	647	0.201148
28	Key	555	0.172546
29	Scalar	539	0.167572
30	Person	532	0.165396
31	ExternalType	489	0.152027
32	Maven	343	0.106637
33	Author	289	0.089848
34	Array	273	0.084874
35	Interface	271	0.084252
36	Committer	243	0.075547
37	Property	202	0.062801
38	Directory	183	0.056894
39	Enum	178	0.055339

## 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: 975025

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	233534	23.951591
1	MODIFIES	233534	23.951591
2	UPDATES	149869	15.370785
3	CREATES	57908	5.939130
4	DELETES	35673	3.658675
5	INVOKES	35529	3.643907
6	COMMITTED	23496	2.409784
7	DEPENDS_ON	21820	2.237891
8	OF_TYPE	21292	2.183739
9	DECLARES	20680	2.120971
10	OF_RAW_TYPE	17041	1.747750
11	HAS_PARENT	14276	1.464168
12	HAS	14057	1.441707
13	RETURNS	12524	1.284480
14	RENAMES	9916	1.017000
15	READS	9069	0.930130
16	HAS_ACTUAL_TYPE_ARGUMENT	8261	0.847260
17	HAS_NEW_NAME	6165	0.632291
18	OF_GENERIC_TYPE	5892	0.604292
19	RESOLVES_TO	5237	0.537114
20	SIMILAR	3955	0.405631
21	CONTAINS	3797	0.389426
22	WRITES	3796	0.389323
23	RETURNS_GENERIC	3538	0.362862
24	ANNOTATED_BY	2801	0.287275
25	REQUIRES	2172	0.222764
26	HAS_FIRST_CHILD	2144	0.219892
27	HAS_LAST_CHILD	2144	0.219892
28	HAS_ELEMENT	2126	0.218046
29	HAS_UPPER_BOUND	1519	0.155791

## 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)

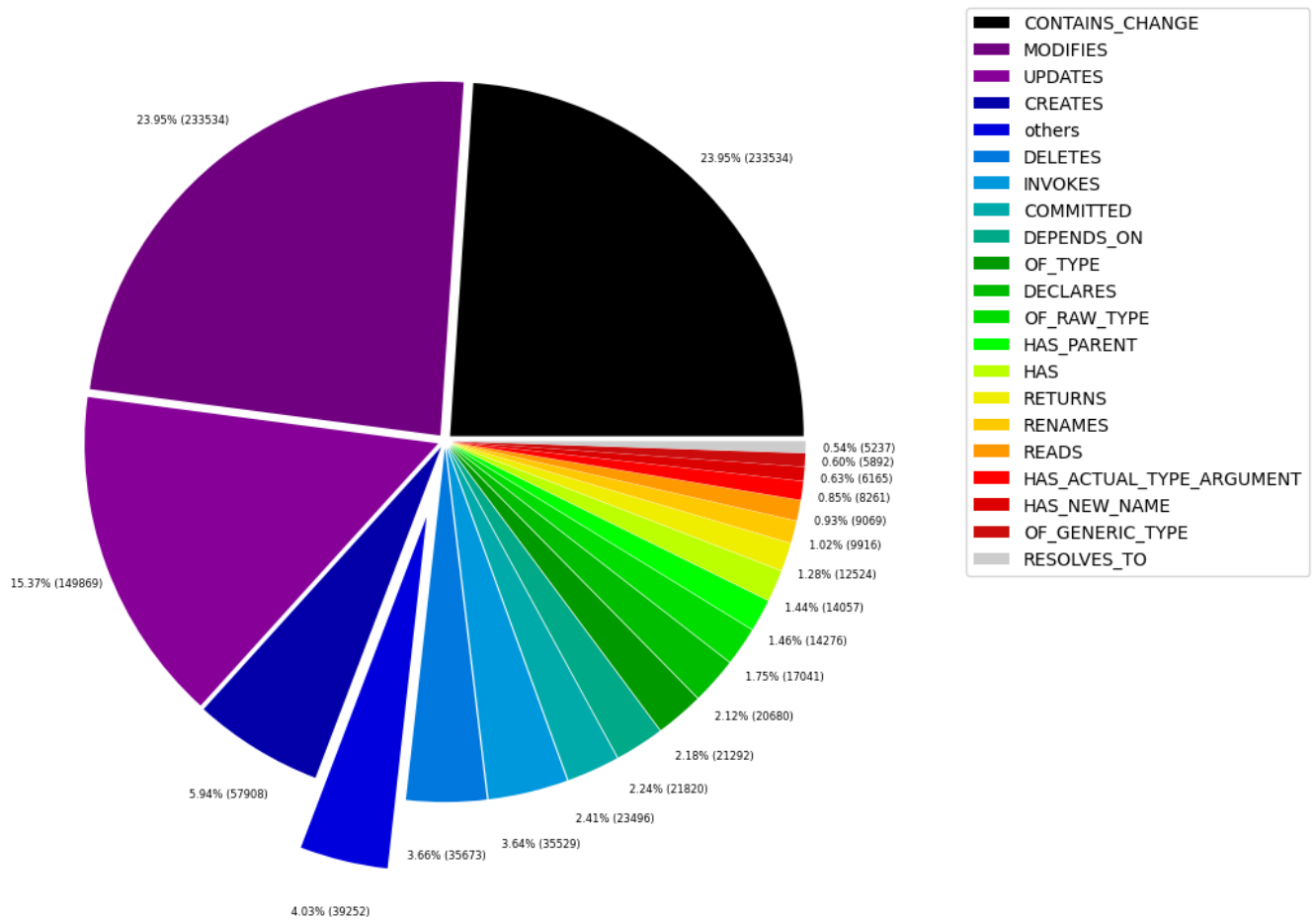


Table 2b - Lowest relationship count by type

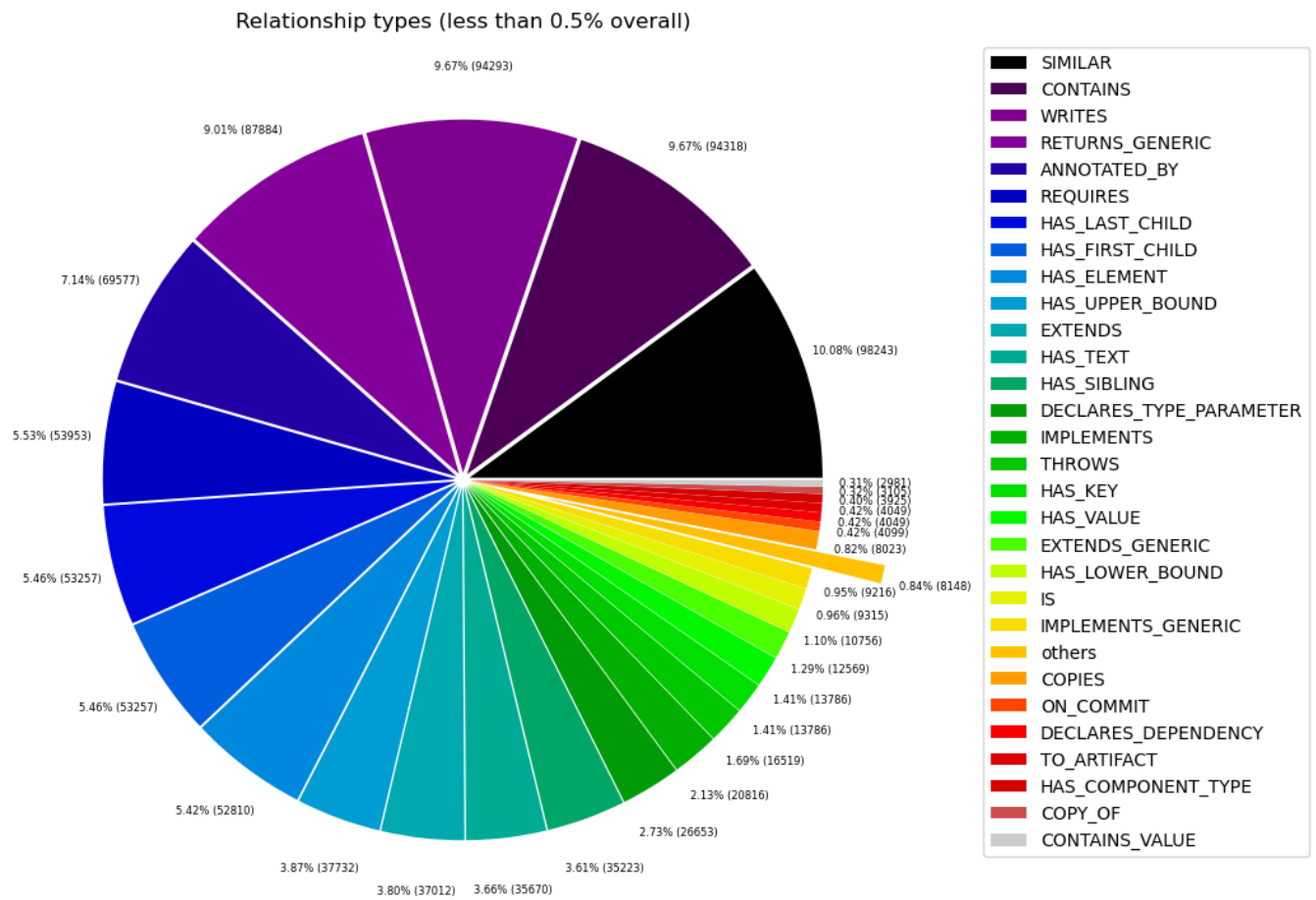
Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000103
1	THROWS_GENERIC	5	0.000513
2	EXCLUDES	5	0.000513
3	DESCRIBES	9	0.000923
4	HAS_ROOT_ELEMENT	11	0.001128
5	HAS_GOAL	16	0.001641
6	HAS_EXECUTION	16	0.001641
7	OF_NAMESPACE	18	0.001846
8	HAS_ATTRIBUTE	18	0.001846
9	INCLUDES_CONCEPT	19	0.001949
10	USES_PLUGIN	21	0.002154
11	REQUIRES_TYPE_PARAMETER	21	0.002154
12	IS_ARTIFACT	21	0.002154
13	HAS_CONFIGURATION	21	0.002154
14	HAS_HEAD	26	0.002667
15	REQUIRES_CONCEPT	28	0.002872
16	DECLARES_NAMESPACE	36	0.003692
17	HAS_DEFAULT	36	0.003692
18	CONTAINS_VALUE	120	0.012307
19	COPY_OF	125	0.012820
20	HAS_COMPONENT_TYPE	158	0.016205
21	TO_ARTIFACT	163	0.016718
22	DECLARES_DEPENDENCY	163	0.016718
23	ON_COMMIT	165	0.016923
24	COPIES	323	0.033127
25	IMPLEMENTS_GENERIC	371	0.038050
26	IS	375	0.038461
27	HAS_LOWER_BOUND	433	0.044409
28	EXTENDS_GENERIC	506	0.051896
29	HAS_VALUE	555	0.056922

## 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>



## 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]	233534	11748	
1	[Git, Change]	MODIFIES	[File, Git]	233534	233534	
2	[Git, Change]	UPDATES	[File, Git]	149869	233534	
3	[Git, Change]	CREATES	[File, Git]	57908	233534	
4	[Git, Change]	DELETES	[File, Git]	35673	233534	
5	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Method]	21582	13094	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14267	11748	
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11748	289	
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11748	243	
9	[Git, Change]	RENAMES	[File, Git]	9916	233534	
10	[Java, ByteCode, Member, Method]	HAS	[Java, ByteCode, Parameter]	8297	13094	
11	[Java, ByteCode, Member, Method]	READS	[Java, ByteCode, Member, Field]	8140	13094	
12	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6335	12968	
13	[File, Git]	HAS_NEW_NAME	[File, Git]	6165	10593	
14	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3554	7094	
15	[Java, ByteCode, Bound, ParameterizedType]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3034	7154	
16	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2902	7154	
17	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound, ParameterizedType]	2650	12968	
18	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2453	7154	
19	[Java, ByteCode, Member, Constructor, Method]	WRITES	[Java, ByteCode, Member, Field]	2423	2045	
20	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalAnnotatio...	2336	2813	
21	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126	2144	
22	[Java, ByteCode, Member, Constructor, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2109	2045	
23	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2087	13094	
24	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2032	13094	
25	[Java, ByteCode, Member, Constructor, Method]	HAS	[Java, ByteCode, Parameter]	2021	2045	
26	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2020	12968	
27	[Java, ByteCode, Member, Method, Lambda]	INVOKES	[Java, ByteCode, Member, Method]	1866	931	
28	[Java, ByteCode, Member, Constructor, Method]	INVOKES	[Java, ByteCode, Member, Method]	1795	2045	
29	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound]	1792	7154	

# Graph Density

```
total_number_of_nodes (vertices): 321653
total_number_of_relationships (edges): 975025
-> total directed graph density: 9.424143465184651e-06
-> total directed graph density in percent: 0.0009424143465184651
```