

# 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`.

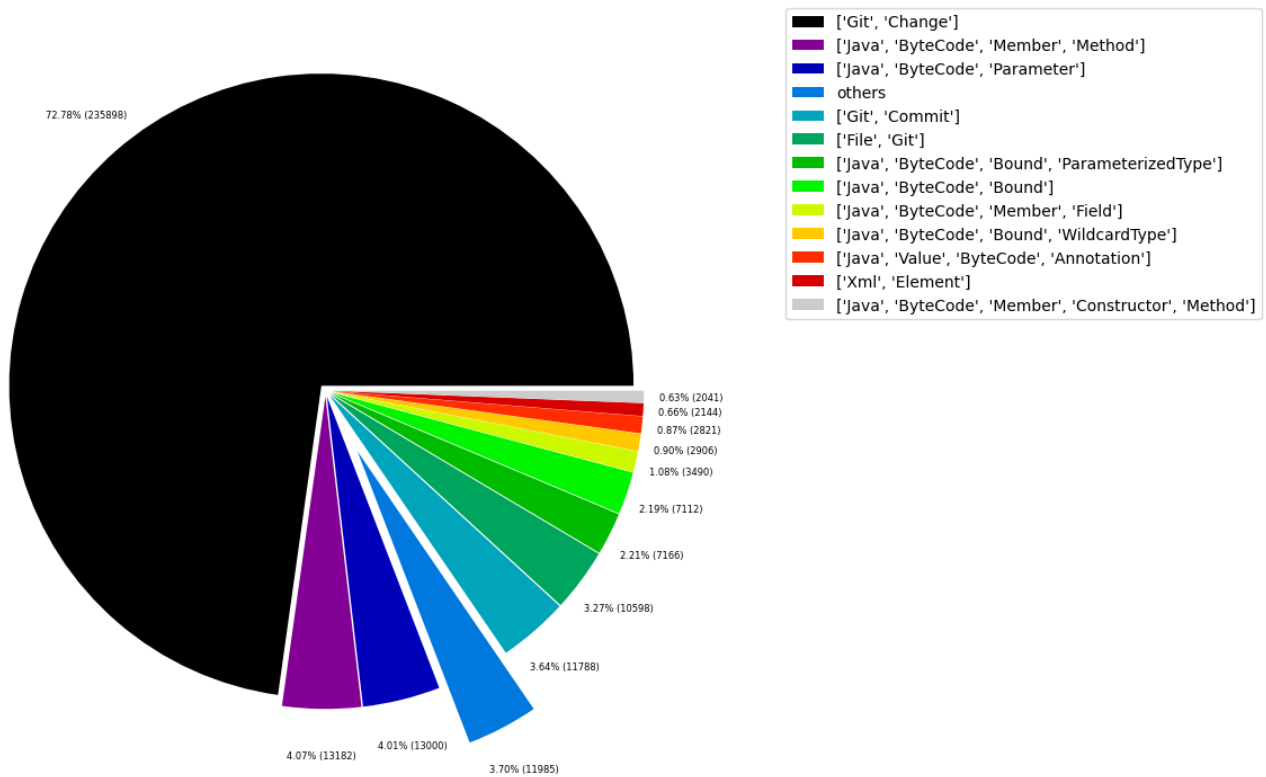
	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	235898	72.778599
1	[Java, ByteCode, Member, Method]	13182	4.066874
2	[Java, ByteCode, Parameter]	13000	4.010724
3	[Git, Commit]	11788	3.636801
4	[File, Git]	10598	3.269666
5	[Java, ByteCode, Bound, ParameterizedType]	7166	2.210835
6	[Java, ByteCode, Bound]	7112	2.194175
7	[Java, ByteCode, Member, Field]	3490	1.076725
8	[Java, ByteCode, Bound, WildcardType]	2906	0.896551
9	[Java, Value, ByteCode, Annotation]	2821	0.870327
10	[Xml, Element]	2144	0.661461
11	[Java, ByteCode, Member, Constructor, Method]	2041	0.629684
12	[Xml, Text]	1436	0.443031
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.338135
14	[Java, ByteCode, Member, Method, Lambda]	936	0.288772
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	900	0.277666
16	[Type, File, Java, ByteCode, Class]	861	0.265633
17	[Type, File, Java, ByteCode, JavaType]	746	0.230154
18	[Java, Value, ByteCode, Primitive]	650	0.200536
19	[Java, ByteCode, GenericDeclaration, Member, M...	569	0.175546
20	[Json, Key]	555	0.171227
21	[Value, Json, Scalar]	539	0.166291
22	[Type, File, Java, ByteCode, ExternalType]	396	0.122173
23	[Author, Git, Person]	289	0.089161
24	[Value, Array]	267	0.082374
25	[Committer, Git, Person]	243	0.074970
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.072810
27	[Value, Property]	202	0.062320
28	[Type, File, Java, ByteCode, Interface]	187	0.057693
29	[Java, Value, ByteCode, Class]	172	0.053065

## 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	0.000309
1	[File, TS, Scan]	1	0.000309
2	[File, Json]	2	0.000617
3	[File]	3	0.000926
4	[Java, ByteCode, GenericDeclaration, Member, C...	4	0.001234
5	[Maven, Exclusion]	5	0.001543
6	[Value, Array, Json]	6	0.001851
7	[Type, File, Java, ByteCode, Void]	9	0.002777
8	[File, Maven, Xml, Pom, Document]	9	0.002777
9	[Java, ManifestSection]	9	0.002777
10	[File, Java, Manifest]	9	0.002777
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002777
12	[File, Java, ServiceLoader]	10	0.003085
13	[File, Java, Properties]	12	0.003702
14	[Maven, ExecutionGoal]	16	0.004936
15	[Maven, PluginExecution]	16	0.004936
16	[Xml, Attribute]	18	0.005553
17	[JQAssistant, Rule, Concept]	19	0.005862
18	[Maven, Plugin]	21	0.006479
19	[Maven, Configuration]	21	0.006479
20	[Git, Branch]	26	0.008021
21	[Type, File, Java, ByteCode, Enum]	28	0.008638
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008947
23	[Xml, Namespace]	36	0.011107
24	[Type, File, Java, ByteCode, Annotation]	43	0.013266
25	[File, Directory]	44	0.013575
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.026224
27	[Artifact, Maven]	92	0.028384
28	[Type, File, Java, ByteCode, ExternalAnnotatio...	93	0.028692
29	[Value, ManifestEntry]	120	0.037022

## 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)

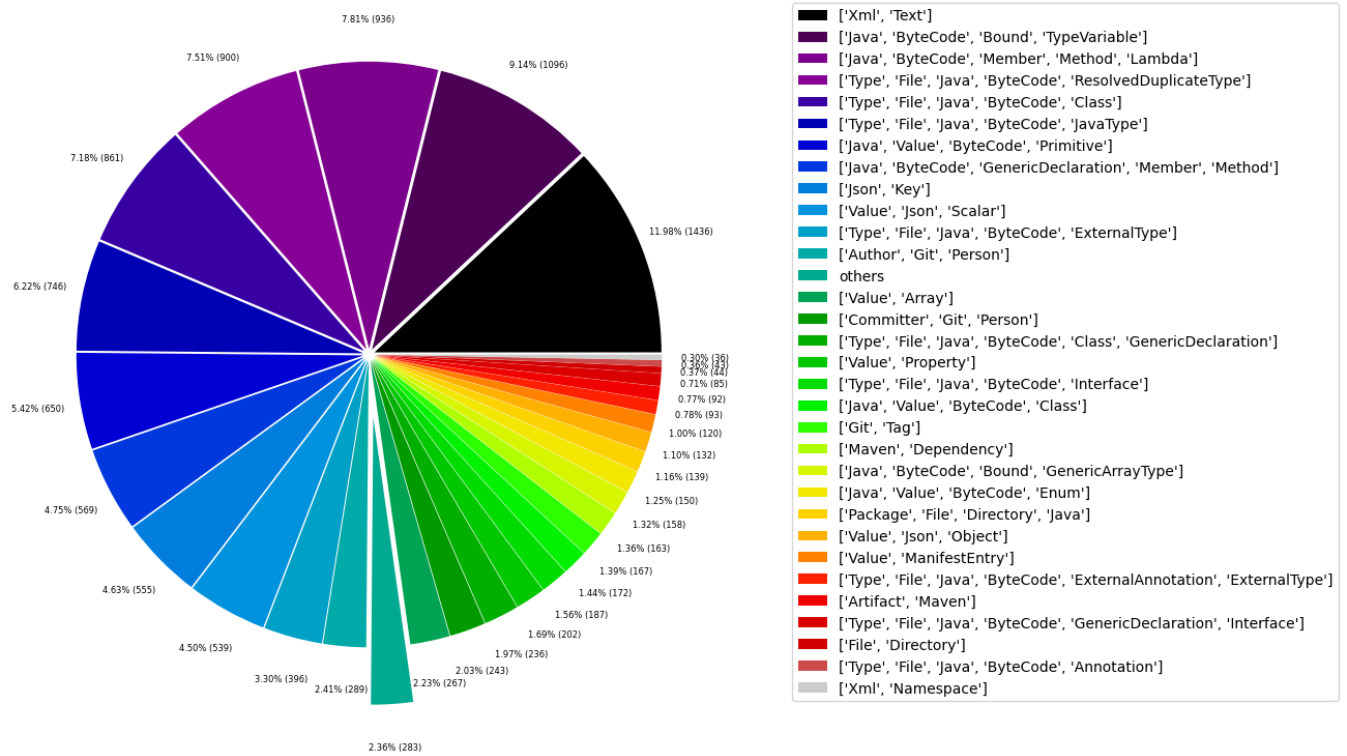


Table 1c - Highest node count by single label

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.

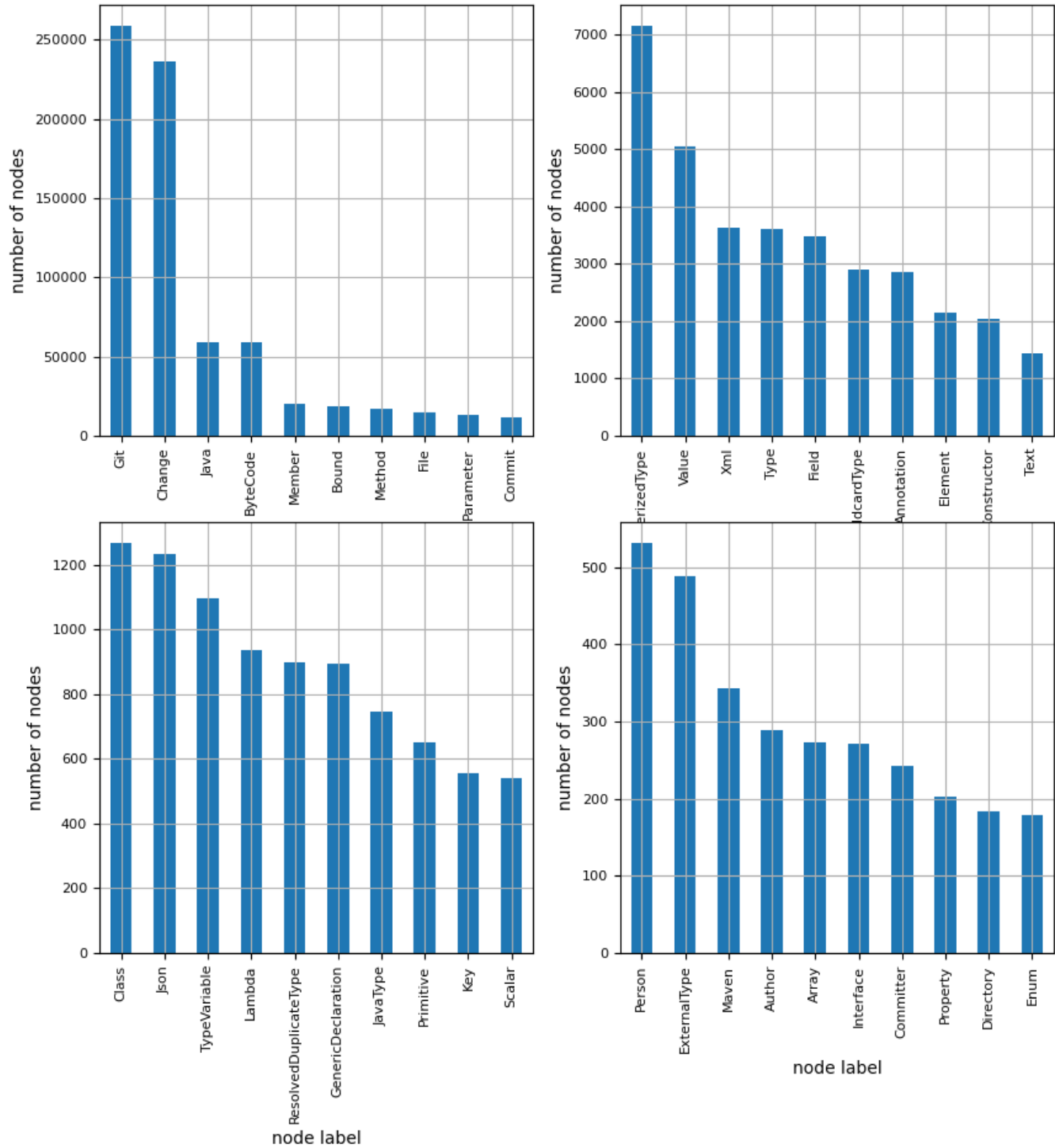
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	259009	79.908741
1	Change	235898	72.778599
2	Java	59254	18.280880
3	ByteCode	59066	18.222879
4	Member	20222	6.238836
5	Bound	18438	5.688441
6	Method	16732	5.162110
7	File	14449	4.457766
8	Parameter	13000	4.010724
9	Commit	11788	3.636801
10	ParameterizedType	7166	2.210835
11	Value	5059	1.560789
12	Xml	3643	1.123928
13	Type	3613	1.114673
14	Field	3490	1.076725
15	WildcardType	2906	0.896551
16	Annotation	2864	0.883593
17	Element	2144	0.661461
18	Constructor	2045	0.630918
19	Text	1436	0.443031
20	Class	1269	0.391508
21	Json	1234	0.380710
22	TypeVariable	1096	0.338135
23	Lambda	936	0.288772
24	ResolvedDuplicateType	900	0.277666
25	GenericDeclaration	894	0.275814
26	JavaType	746	0.230154
27	Primitive	650	0.200536
28	Key	555	0.171227
29	Scalar	539	0.166291
30	Person	532	0.164131
31	ExternalType	489	0.150865
32	Maven	343	0.105821
33	Author	289	0.089161
34	Array	273	0.084225
35	Interface	272	0.083917
36	Committer	243	0.074970
37	Property	202	0.062320
38	Directory	183	0.056459
39	Enum	178	0.054916

## 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: 982704

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	235898	24.004990
1	MODIFIES	235898	24.004990
2	UPDATES	151661	15.433030
3	CREATES	58219	5.924368
4	DELETES	35985	3.661835
5	INVOKES	35601	3.622759
6	COMMITTED	23576	2.399095
7	DEPENDS_ON	21873	2.225797
8	OF_TYPE	21347	2.172272
9	DECLARES	20663	2.102668
10	OF_RAW_TYPE	17077	1.737756
11	HAS_PARENT	14328	1.458018
12	HAS	14094	1.434206
13	RETURNS	12547	1.276783
14	RENAMES	9967	1.014242
15	READS	9078	0.923778
16	HAS_ACTUAL_TYPE_ARGUMENT	8276	0.842166
17	HAS_NEW_NAME	6165	0.627351
18	OF_GENERIC_TYPE	5902	0.600588
19	RESOLVES_TO	5235	0.532714
20	SIMILAR	3968	0.403784
21	CONTAINS	3805	0.387197
22	WRITES	3803	0.386993
23	RETURNS_GENERIC	3543	0.360536
24	ANNOTATED_BY	2809	0.285844
25	REQUIRES	2173	0.221125
26	HAS_FIRST_CHILD	2144	0.218174
27	HAS_LAST_CHILD	2144	0.218174
28	HAS_ELEMENT	2126	0.216342
29	HAS_UPPER_BOUND	1521	0.154777

## 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)

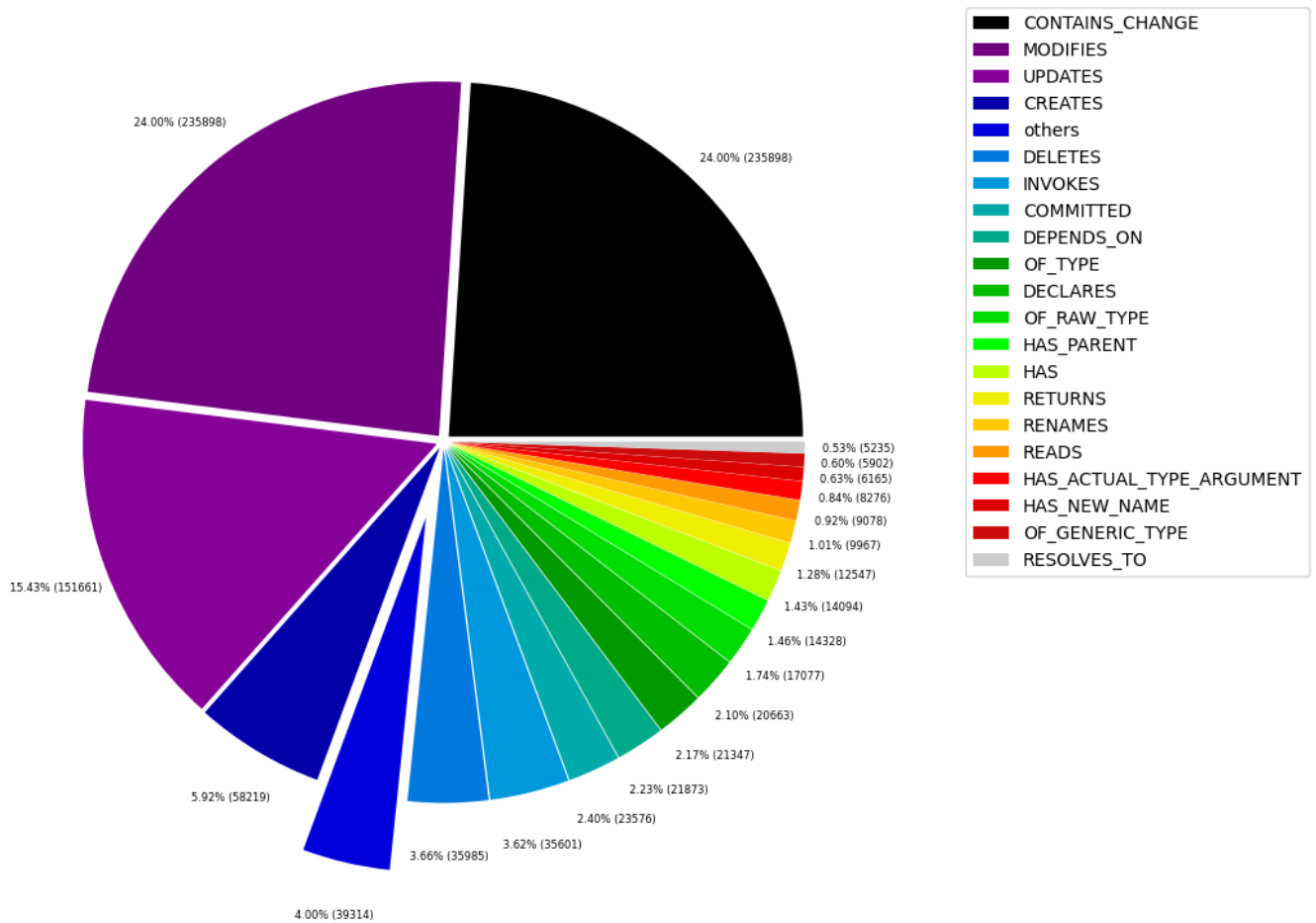


Table 2b - Lowest relationship count by type

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.

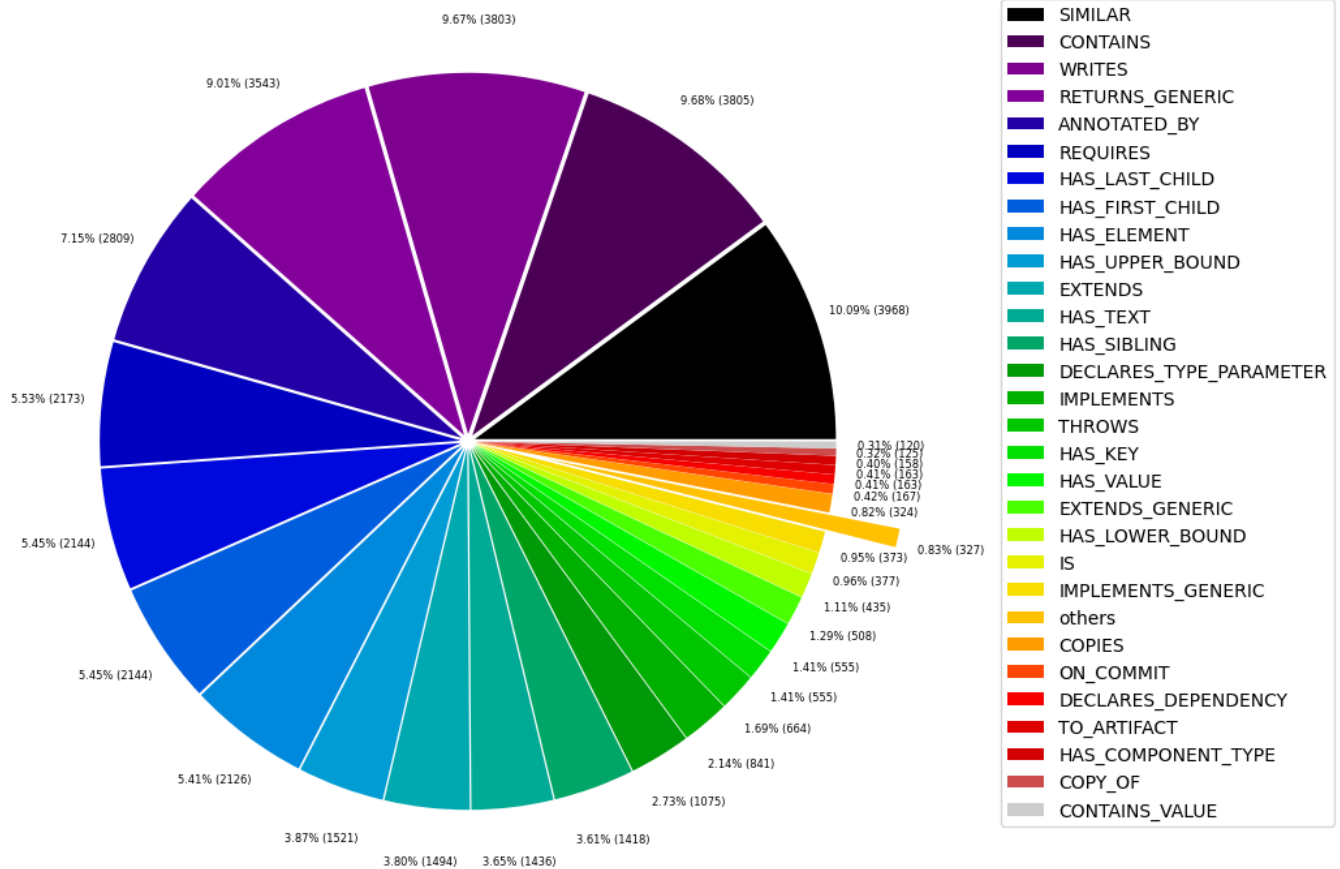
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000102
1	THROWS_GENERIC	5	0.000509
2	EXCLUDES	5	0.000509
3	DESCRIBES	9	0.000916
4	HAS_ROOT_ELEMENT	10	0.001018
5	HAS_GOAL	16	0.001628
6	HAS_EXECUTION	16	0.001628
7	OF_NAMESPACE	18	0.001832
8	HAS_ATTRIBUTE	18	0.001832
9	INCLUDES_CONCEPT	19	0.001933
10	USES_PLUGIN	21	0.002137
11	REQUIRES_TYPE_PARAMETER	21	0.002137
12	IS_ARTIFACT	21	0.002137
13	HAS_CONFIGURATION	21	0.002137
14	HAS_HEAD	26	0.002646
15	REQUIRES_CONCEPT	28	0.002849
16	DECLARES_NAMESPACE	36	0.003663
17	HAS_DEFAULT	36	0.003663
18	CONTAINS_VALUE	120	0.012211
19	COPY_OF	125	0.012720
20	HAS_COMPONENT_TYPE	158	0.016078
21	TO_ARTIFACT	163	0.016587
22	DECLARES_DEPENDENCY	163	0.016587
23	ON_COMMIT	167	0.016994
24	COPIES	324	0.032970
25	IMPLEMENTS_GENERIC	373	0.037956
26	IS	377	0.038364
27	HAS_LOWER_BOUND	435	0.044266
28	EXTENDS_GENERIC	508	0.051694
29	HAS_VALUE	555	0.056477

## 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]	235898	11788	
1	[Git, Change]	MODIFIES	[File, Git]	235898	235898	
2	[Git, Change]	UPDATES	[File, Git]	151661	235898	
3	[Git, Change]	CREATES	[File, Git]	58219	235898	
4	[Git, Change]	DELETES	[File, Git]	35985	235898	
5	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Method]	21568	13067	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14319	11788	
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11788	289	
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11788	243	
9	[Git, Change]	RENAMES	[File, Git]	9967	235898	
10	[Java, ByteCode, Member, Method]	HAS	[Java, ByteCode, Parameter]	8316	13067	
11	[Java, ByteCode, Member, Method]	READS	[Java, ByteCode, Member, Field]	8129	13067	
12	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6360	13000	
13	[File, Git]	HAS_NEW_NAME	[File, Git]	6165	10598	
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, Member, Constructor, Method]	WRITES	[Java, ByteCode, Member, Field]	2426	2041	
20	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalAnnotatio...	2340	2821	
21	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126	2144	
22	[Java, ByteCode, Member, Constructor, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2111	2041	
23	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2086	13067	
24	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2030	13067	
25	[Java, ByteCode, Member, Constructor, Method]	HAS	[Java, ByteCode, Parameter]	2023	2041	
26	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2023	13000	
27	[Java, ByteCode, Member, Method, Lambda]	INVOKES	[Java, ByteCode, Member, Method]	1885	936	
28	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound]	1802	7166	
29	[Java, ByteCode, Member, Constructor, Method]	INVOKES	[Java, ByteCode, Member, Method]	1796	2041	

# Graph Density

```
total_number_of_nodes (vertices): 324131
total_number_of_relationships (edges): 982704
-> total directed graph density: 9.353688989397358e-06
-> total directed graph density in percent: 0.0009353688989397358
```