

# 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]	240780	73.164062
1	[Java, ByteCode, Member, Method]	13182	4.005518
2	[Java, ByteCode, Parameter]	13000	3.950215
3	[Git, Commit]	11858	3.603204
4	[File, Git]	10614	3.225199
5	[Java, ByteCode, Bound, ParameterizedType]	7166	2.177480
6	[Java, ByteCode, Bound]	7112	2.161072
7	[Java, ByteCode, Member, Field]	3489	1.060177
8	[Java, ByteCode, Bound, WildcardType]	2906	0.883025
9	[Java, Value, ByteCode, Annotation]	2821	0.857197
10	[Xml, Element]	2144	0.651482
11	[Java, ByteCode, Member, Constructor, Method]	2035	0.618361
12	[Xml, Text]	1436	0.436347
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.333034
14	[Java, ByteCode, Member, Method, Lambda]	936	0.284415
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	900	0.273476
16	[Type, File, Java, ByteCode, Class]	861	0.261626
17	[Type, File, Java, ByteCode, JavaType]	746	0.226682
18	[Java, Value, ByteCode, Primitive]	650	0.197511
19	[Java, ByteCode, GenericDeclaration, Member, M...	569	0.172898
20	[Json, Key]	555	0.168644
21	[Value, Json, Scalar]	539	0.163782
22	[Type, File, Java, ByteCode, ExternalType]	396	0.120330
23	[Author, Git, Person]	290	0.088120
24	[Value, Array]	267	0.081131
25	[Committer, Git, Person]	244	0.074142
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.071712
27	[Value, Property]	202	0.061380
28	[Type, File, Java, ByteCode, Interface]	187	0.056822
29	[Java, Value, ByteCode, Class]	172	0.052264

## 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)

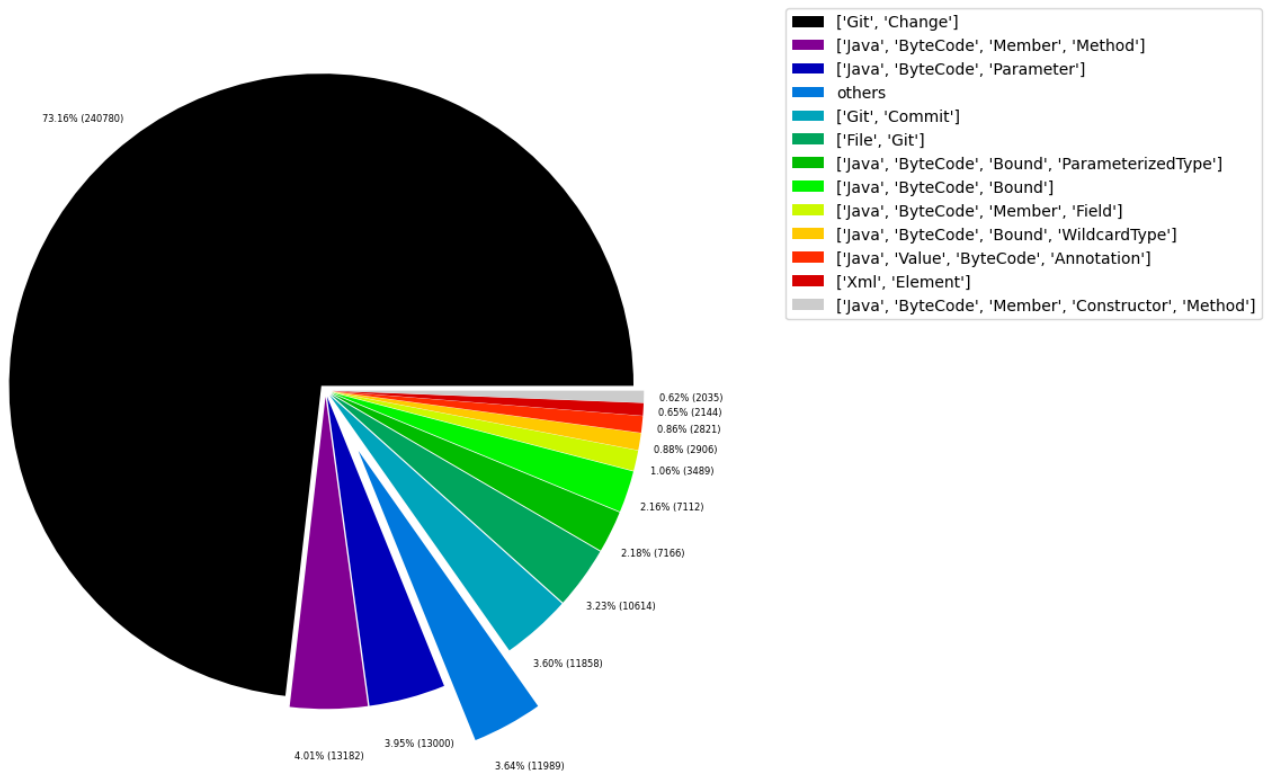


Table 1b - Lowest node count by label combination

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	0.000304
1	[File, TS, Scan]	1	0.000304
2	[File, Json]	2	0.000608
3	[File]	3	0.000912
4	[Java, ByteCode, GenericDeclaration, Member, C...	4	0.001215
5	[Maven, Exclusion]	5	0.001519
6	[Value, Array, Json]	6	0.001823
7	[Type, File, Java, ByteCode, Void]	9	0.002735
8	[File, Maven, Xml, Pom, Document]	9	0.002735
9	[Java, ManifestSection]	9	0.002735
10	[File, Java, Manifest]	9	0.002735
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002735
12	[File, Java, ServiceLoader]	10	0.003039
13	[File, Java, Properties]	12	0.003646
14	[Maven, ExecutionGoal]	16	0.004862
15	[Maven, PluginExecution]	16	0.004862
16	[Xml, Attribute]	18	0.005470
17	[JQAssistant, Rule, Concept]	19	0.005773
18	[Maven, Plugin]	21	0.006381
19	[Maven, Configuration]	21	0.006381
20	[Git, Branch]	28	0.008508
21	[Type, File, Java, ByteCode, Enum]	28	0.008508
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008812
23	[Xml, Namespace]	36	0.010939
24	[Type, File, Java, ByteCode, Annotation]	43	0.013066
25	[File, Directory]	44	0.013370
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.025828
27	[Artifact, Maven]	92	0.027955
28	[Type, File, Java, ByteCode, ExternalAnnotatio...	93	0.028259
29	[Value, ManifestEntry]	120	0.036464

## 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)

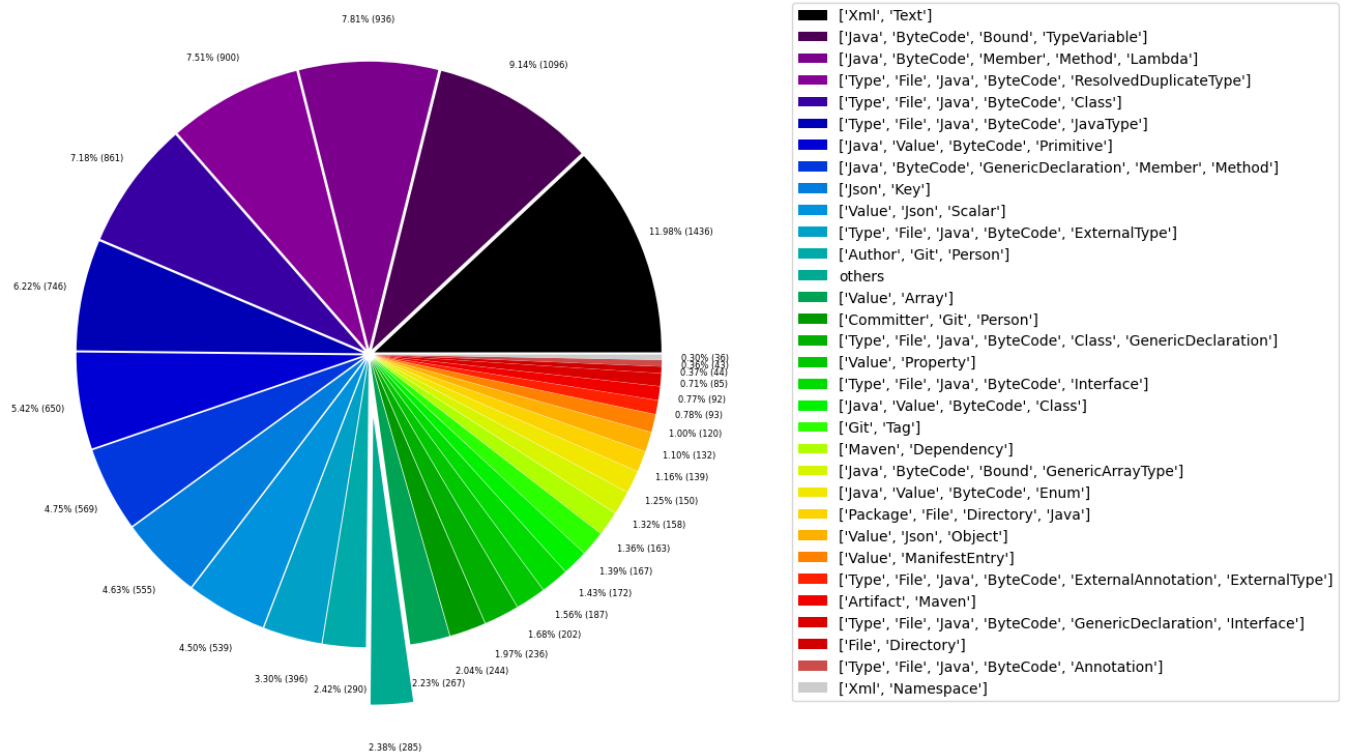


Table 1c - Highest node count by single label

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.

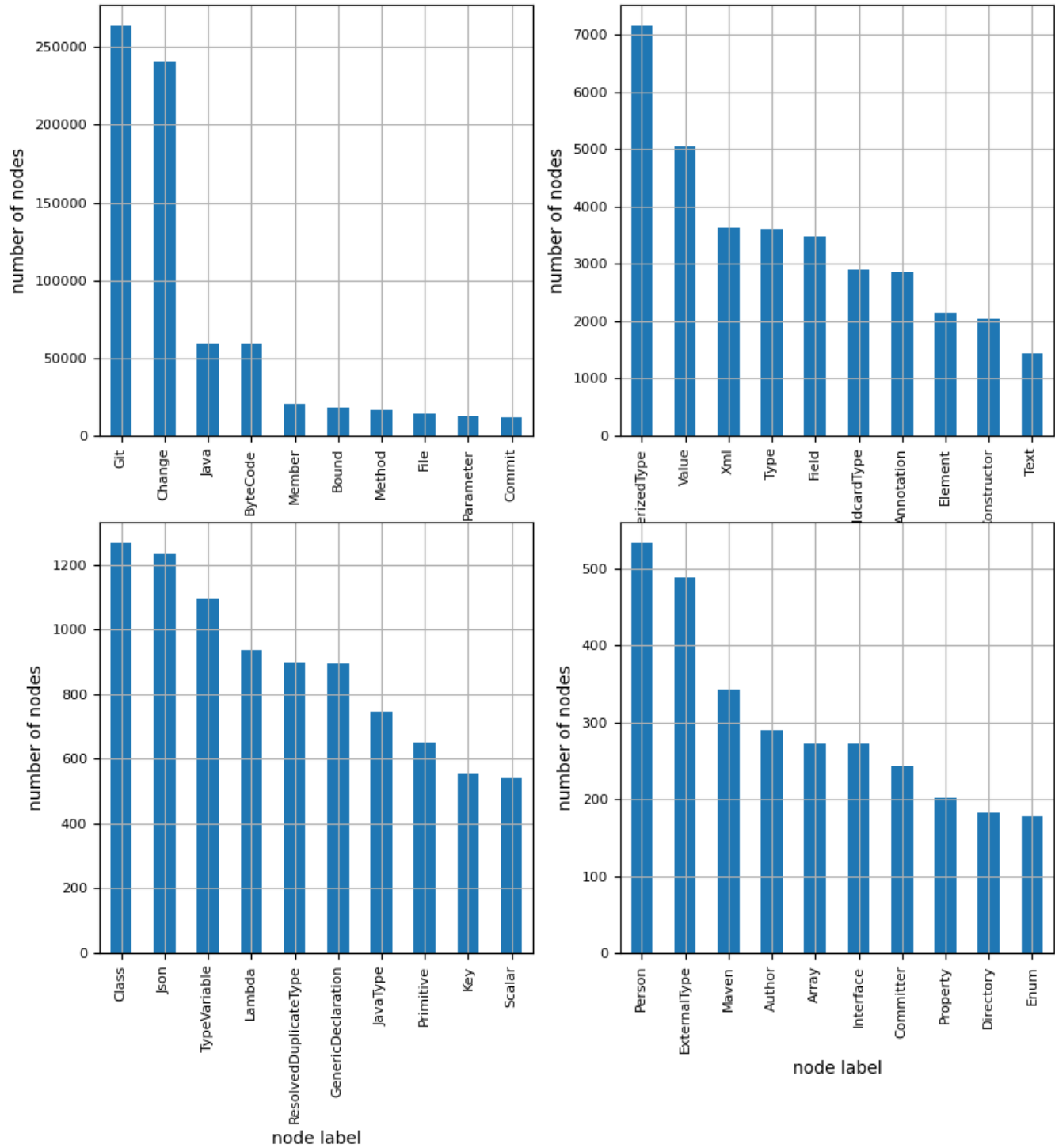
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	263981	80.213980
1	Change	240780	73.164062
2	Java	59247	18.002954
3	ByteCode	59059	17.945827
4	Member	20215	6.142585
5	Bound	18438	5.602621
6	Method	16726	5.082408
7	File	14465	4.395374
8	Parameter	13000	3.950215
9	Commit	11858	3.603204
10	ParameterizedType	7166	2.177480
11	Value	5059	1.537241
12	Xml	3643	1.106972
13	Type	3613	1.097856
14	Field	3489	1.060177
15	WildcardType	2906	0.883025
16	Annotation	2864	0.870263
17	Element	2144	0.651482
18	Constructor	2039	0.619576
19	Text	1436	0.436347
20	Class	1269	0.385602
21	Json	1234	0.374967
22	TypeVariable	1096	0.333034
23	Lambda	936	0.284415
24	ResolvedDuplicateType	900	0.273476
25	GenericDeclaration	894	0.271653
26	JavaType	746	0.226682
27	Primitive	650	0.197511
28	Key	555	0.168644
29	Scalar	539	0.163782
30	Person	534	0.162263
31	ExternalType	489	0.148589
32	Maven	343	0.104225
33	Author	290	0.088120
34	Array	273	0.082955
35	Interface	272	0.082651
36	Committer	244	0.074142
37	Property	202	0.061380
38	Directory	183	0.055607
39	Enum	178	0.054088

## 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: 997909

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	240780	24.128453
1	MODIFIES	240780	24.128453
2	UPDATES	155401	15.572662
3	CREATES	58833	5.895628
4	DELETES	36677	3.675385
5	INVOKES	35596	3.567059
6	COMMITTED	23716	2.376569
7	DEPENDS_ON	21873	2.191883
8	OF_TYPE	21347	2.139173
9	DECLARES	20656	2.069928
10	OF_RAW_TYPE	17077	1.711278
11	HAS_PARENT	14418	1.444821
12	HAS	14094	1.412353
13	RETURNS	12547	1.257329
14	RENAMES	10131	1.015223
15	READS	9078	0.909702
16	HAS_ACTUAL_TYPE_ARGUMENT	8276	0.829334
17	HAS_NEW_NAME	6178	0.619095
18	OF_GENERIC_TYPE	5902	0.591437
19	RESOLVES_TO	5231	0.524196
20	SIMILAR	3968	0.397631
21	CONTAINS	3805	0.381297
22	WRITES	3803	0.381097
23	RETURNS_GENERIC	3543	0.355042
24	ANNOTATED_BY	2809	0.281489
25	REQUIRES	2173	0.217755
26	HAS_FIRST_CHILD	2144	0.214849
27	HAS_LAST_CHILD	2144	0.214849
28	HAS_ELEMENT	2126	0.213045
29	HAS_UPPER_BOUND	1521	0.152419

## 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)

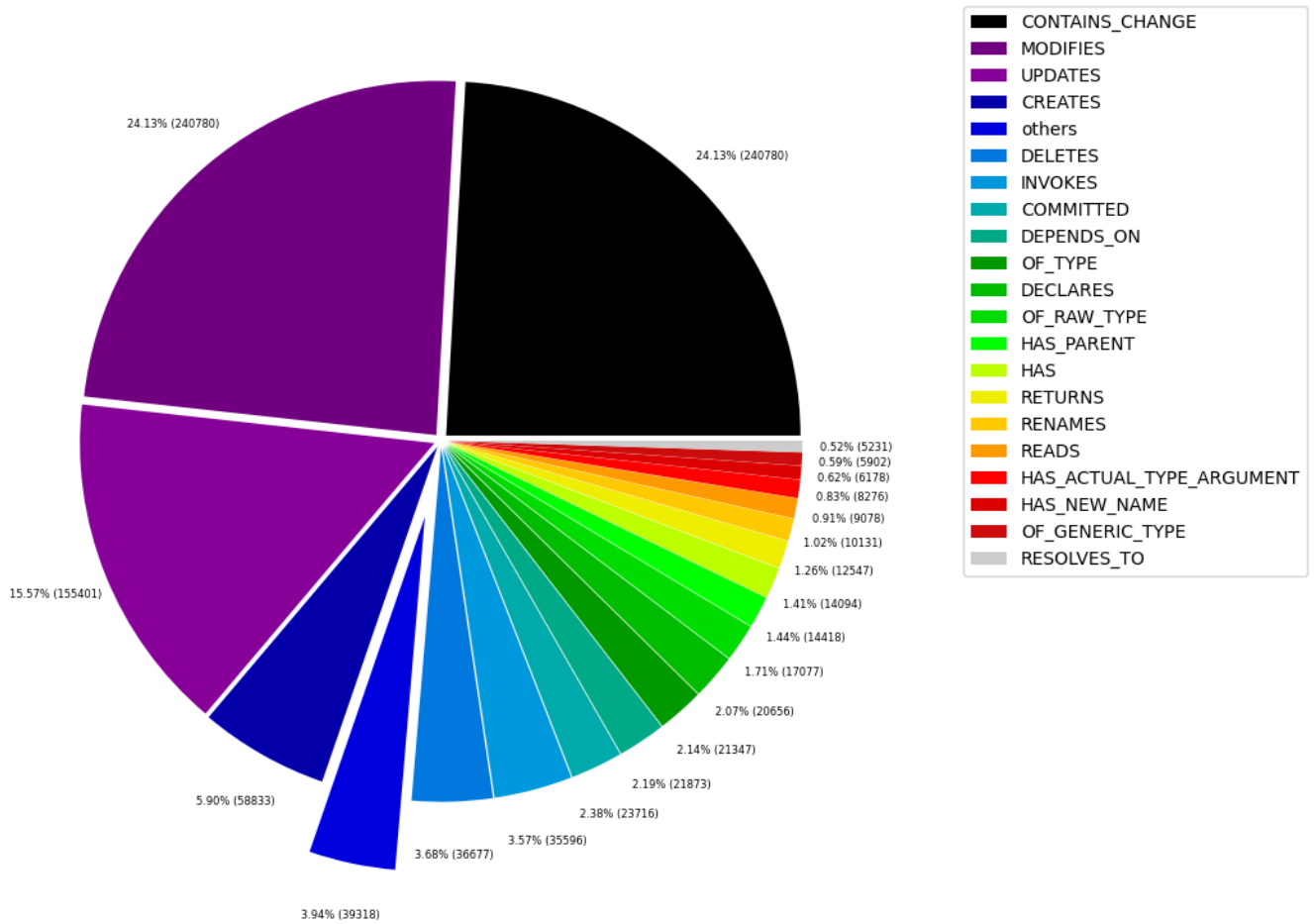


Table 2b - Lowest relationship count by type

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.

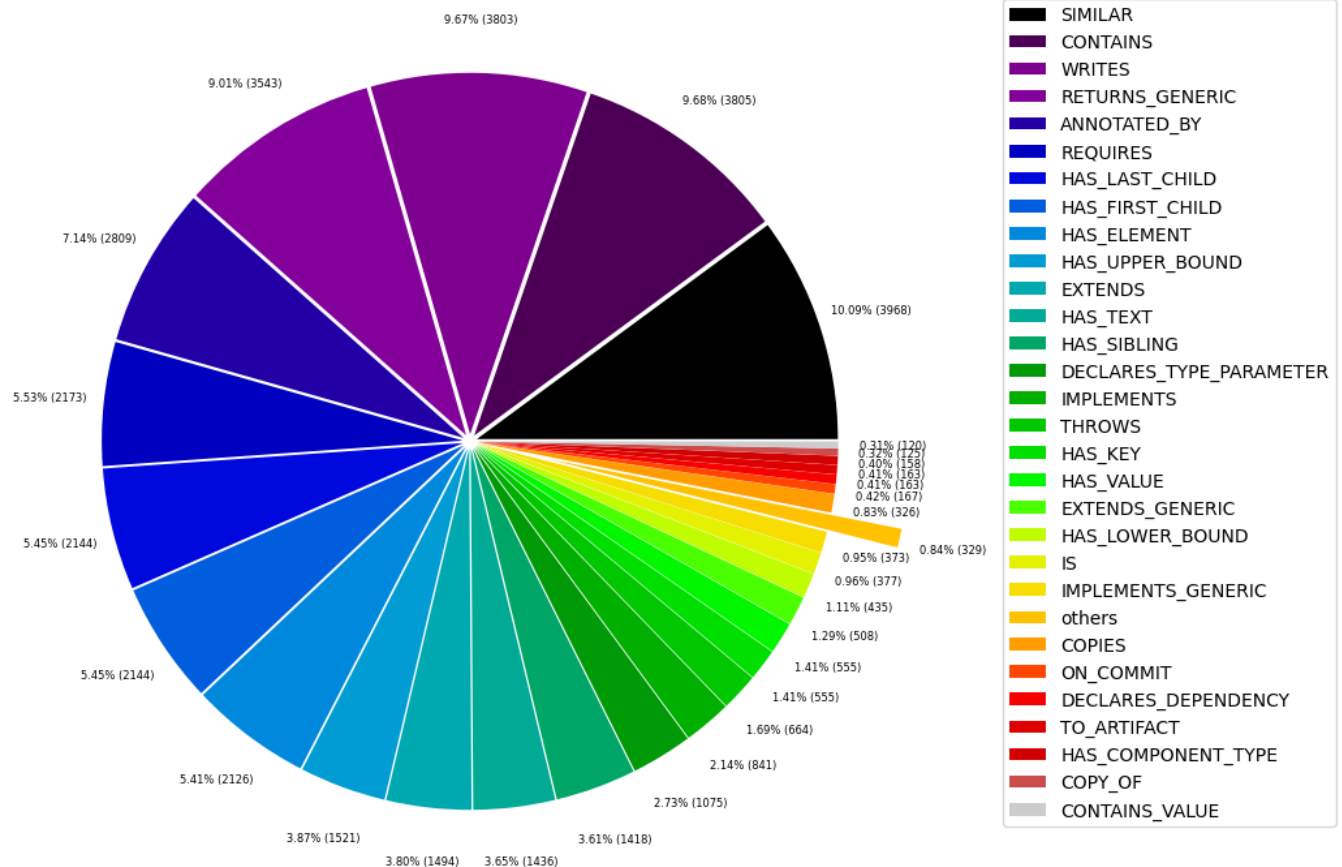
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000100
1	THROWS_GENERIC	5	0.000501
2	EXCLUDES	5	0.000501
3	DESCRIBES	9	0.000902
4	HAS_ROOT_ELEMENT	10	0.001002
5	HAS_GOAL	16	0.001603
6	HAS_EXECUTION	16	0.001603
7	OF_NAMESPACE	18	0.001804
8	HAS_ATTRIBUTE	18	0.001804
9	INCLUDES_CONCEPT	19	0.001904
10	USES_PLUGIN	21	0.002104
11	REQUIRES_TYPE_PARAMETER	21	0.002104
12	IS_ARTIFACT	21	0.002104
13	HAS_CONFIGURATION	21	0.002104
14	REQUIRES_CONCEPT	28	0.002806
15	HAS_HEAD	28	0.002806
16	DECLARES_NAMESPACE	36	0.003608
17	HAS_DEFAULT	36	0.003608
18	CONTAINS_VALUE	120	0.012025
19	COPY_OF	125	0.012526
20	HAS_COMPONENT_TYPE	158	0.015833
21	TO_ARTIFACT	163	0.016334
22	DECLARES_DEPENDENCY	163	0.016334
23	ON_COMMIT	167	0.016735
24	COPIES	326	0.032668
25	IMPLEMENTS_GENERIC	373	0.037378
26	IS	377	0.037779
27	HAS_LOWER_BOUND	435	0.043591
28	EXTENDS_GENERIC	508	0.050906
29	HAS_VALUE	555	0.055616

## 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]	240780	11858	
1	[Git, Change]	MODIFIES	[File, Git]	240780	240780	
2	[Git, Change]	UPDATES	[File, Git]	155401	240780	
3	[Git, Change]	CREATES	[File, Git]	58833	240780	
4	[Git, Change]	DELETES	[File, Git]	36677	240780	
5	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Method]	21576	13068	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14409	11858	
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11858	290	
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11858	244	
9	[Git, Change]	RENAMES	[File, Git]	10131	240780	
10	[Java, ByteCode, Member, Method]	HAS	[Java, ByteCode, Parameter]	8317	13068	
11	[Java, ByteCode, Member, Method]	READS	[Java, ByteCode, Member, Field]	8135	13068	
12	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6360	13000	
13	[File, Git]	HAS_NEW_NAME	[File, Git]	6178	10614	
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	2035	
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	2035	
23	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2086	13068	
24	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2031	13068	
25	[Java, ByteCode, Member, Constructor, Method]	HAS	[Java, ByteCode, Parameter]	2023	2035	
26	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2023	13000	
27	[Java, ByteCode, Member, Method, Lambda]	INVOKES	[Java, ByteCode, Member, Method]	1884	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	2035	

# Graph Density

```
total_number_of_nodes (vertices): 329096
total_number_of_relationships (edges): 997909
-> total directed graph density: 9.213975471068424e-06
-> total directed graph density in percent: 0.0009213975471068424
```