

# 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: 319227

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	231255	72.442181
1	[Java, ByteCode, Method, Member]	13192	4.132483
2	[Java, ByteCode, Parameter]	12968	4.062313
3	[Git, Commit]	11657	3.651633
4	[File, Git]	10572	3.311750
5	[Java, ByteCode, Bound, ParameterizedType]	7154	2.241039
6	[Java, ByteCode, Bound]	7094	2.222243
7	[Java, ByteCode, Member, Field]	3481	1.090447
8	[Java, ByteCode, Bound, WildcardType]	2902	0.909071
9	[Java, Value, ByteCode, Annotation]	2813	0.881191
10	[Xml, Element]	2144	0.671622
11	[Java, ByteCode, Constructor, Method, Member]	2034	0.637164
12	[Xml, Text]	1436	0.449837
13	[Java, ByteCode, Bound, TypeVariable]	1094	0.342703
14	[Java, ByteCode, Method, Member, Lambda]	931	0.291642
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	899	0.281618
16	[Type, File, Java, ByteCode, Class]	858	0.268774
17	[Type, File, Java, ByteCode, JavaType]	746	0.233690
18	[Java, Value, ByteCode, Primitive]	647	0.202677
19	[Java, ByteCode, Method, Member, GenericDeclar...	567	0.177617
20	[Json, Key]	555	0.173857
21	[Value, Json, Scalar]	539	0.168845
22	[Type, File, Java, ByteCode, ExternalType]	396	0.124050
23	[Author, Git, Person]	288	0.090218
24	[Value, Array]	267	0.083640
25	[Committer, Git, Person]	242	0.075808
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.073929
27	[Value, Property]	202	0.063278
28	[Type, File, Java, ByteCode, Interface]	186	0.058266
29	[Java, Value, ByteCode, Class]	170	0.053254

## 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)

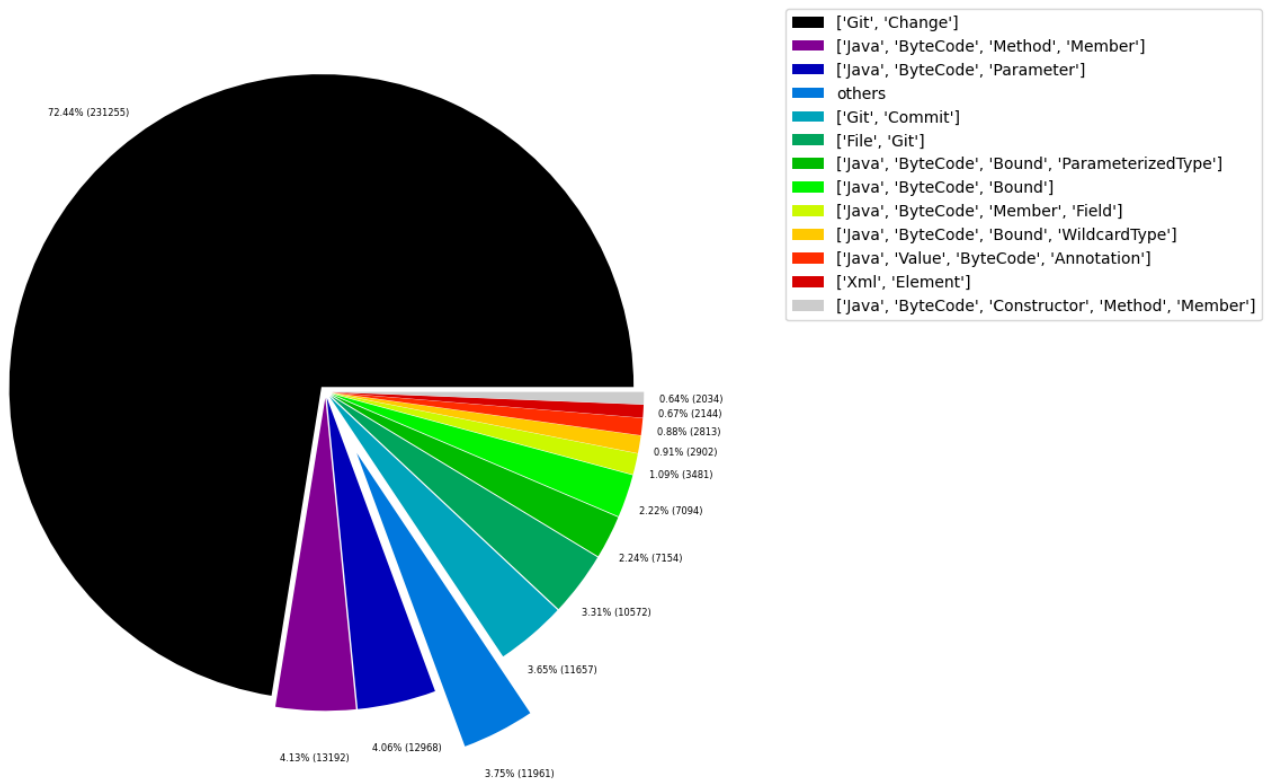


Table 1b - Lowest node count by label combination

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	0.000313
1	[File, TS, Scan]	1	0.000313
2	[File, Json]	2	0.000627
3	[File]	3	0.000940
4	[Java, ByteCode, Constructor, Method, Member, ...]	4	0.001253
5	[Maven, Exclusion]	5	0.001566
6	[Value, Array, Json]	6	0.001880
7	[File, Maven, Xml, Pom, Document]	9	0.002819
8	[Type, File, Java, ByteCode, Void]	9	0.002819
9	[Java, ManifestSection]	9	0.002819
10	[File, Java, Manifest]	9	0.002819
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002819
12	[File, Java, ServiceLoader]	10	0.003133
13	[File, Java, Properties]	12	0.003759
14	[Maven, ExecutionGoal]	16	0.005012
15	[Maven, PluginExecution]	16	0.005012
16	[Xml, Attribute]	18	0.005639
17	[jQAssistant, Rule, Concept]	19	0.005952
18	[Maven, Plugin]	21	0.006578
19	[Maven, Configuration]	21	0.006578
20	[Git, Branch]	25	0.007831
21	[Type, File, Java, ByteCode, Enum]	28	0.008771
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.009084
23	[Xml, Namespace]	36	0.011277
24	[Type, File, Java, ByteCode, Annotation]	43	0.013470
25	[File, Directory]	44	0.013783
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.026627
27	[Artifact, Maven]	92	0.028820
28	[Type, File, Java, ByteCode, ExternalType, Ext...	93	0.029133
29	[Value, ManifestEntry]	120	0.037591

## 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.

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Nodes per label combination (less than 0.5% overall)

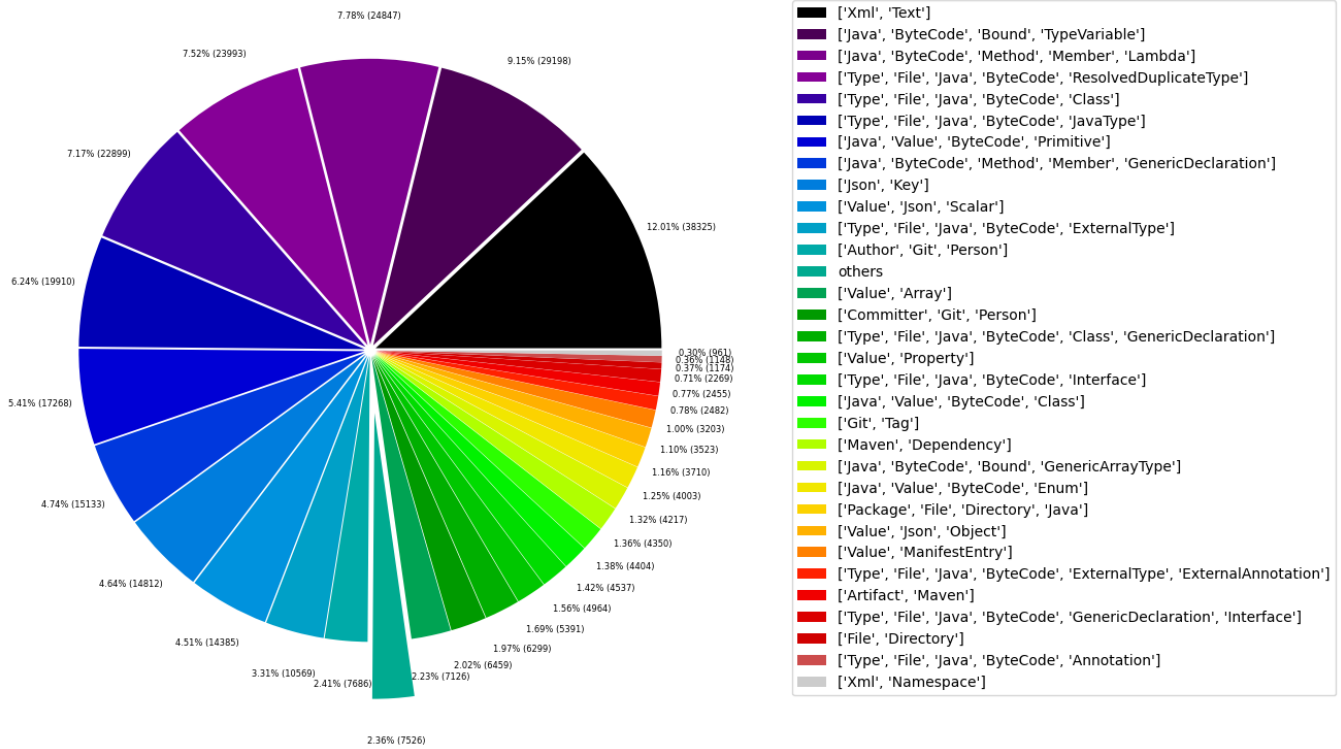


Table 1c - Highest node count by single label

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.

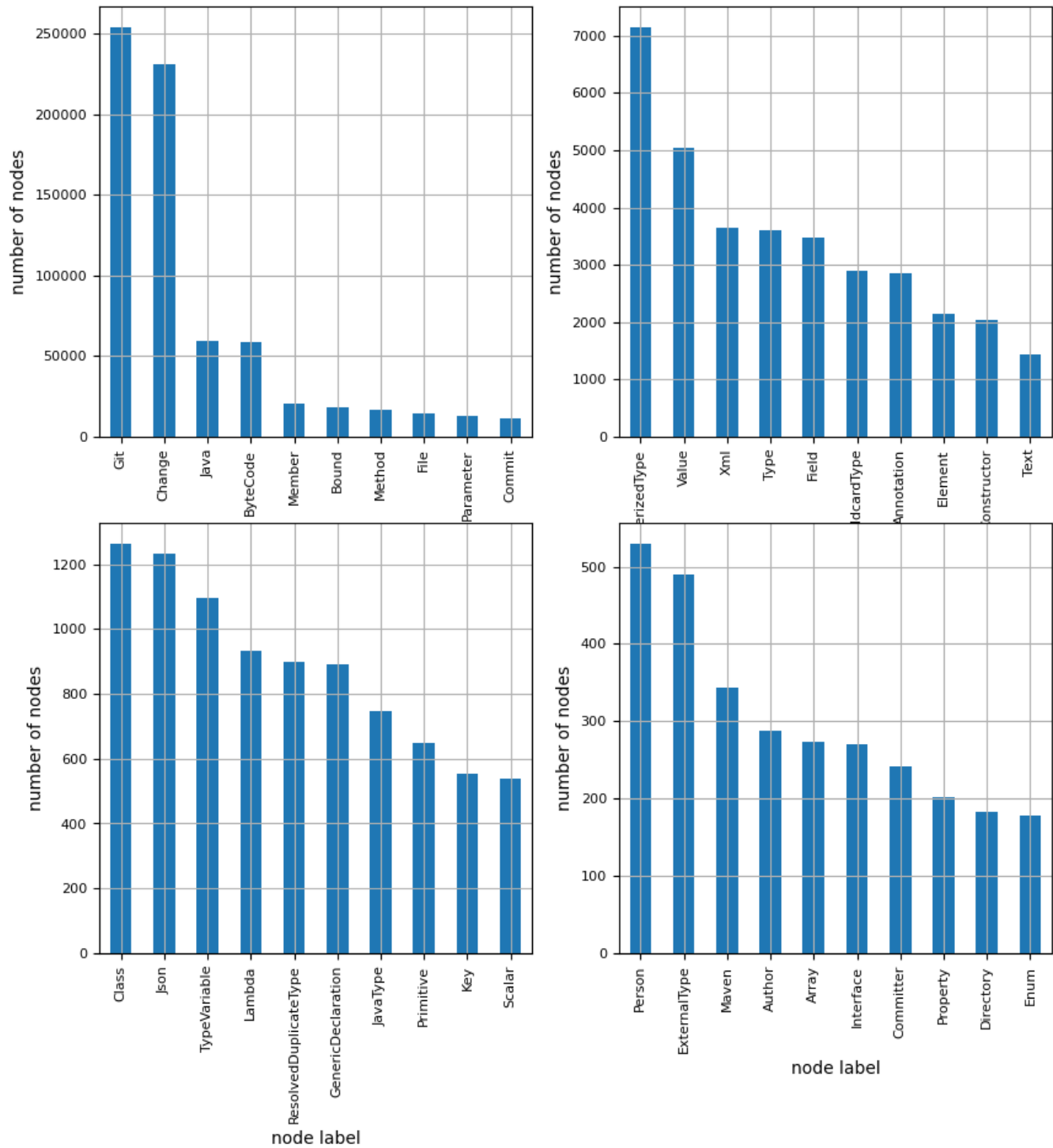
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	254204	79.631109
1	Change	231255	72.442181
2	Java	59155	18.530701
3	ByteCode	58967	18.471808
4	Member	20209	6.330605
5	Bound	18402	5.764550
6	Method	16728	5.240158
7	File	14418	4.516535
8	Parameter	12968	4.062313
9	Commit	11657	3.651633
10	ParameterizedType	7154	2.241039
11	Value	5046	1.580693
12	Xml	3643	1.141194
13	Type	3608	1.130230
14	Field	3481	1.090447
15	WildcardType	2902	0.909071
16	Annotation	2856	0.894661
17	Element	2144	0.671622
18	Constructor	2038	0.638417
19	Text	1436	0.449837
20	Class	1264	0.395956
21	Json	1234	0.386559
22	TypeVariable	1094	0.342703
23	Lambda	931	0.291642
24	ResolvedDuplicateType	899	0.281618
25	GenericDeclaration	892	0.279425
26	JavaType	746	0.233690
27	Primitive	647	0.202677
28	Key	555	0.173857
29	Scalar	539	0.168845
30	Person	530	0.166026
31	ExternalType	489	0.153183
32	Maven	343	0.107447
33	Author	288	0.090218
34	Array	273	0.085519
35	Interface	271	0.084893
36	Committer	242	0.075808
37	Property	202	0.063278
38	Directory	183	0.057326
39	Enum	178	0.055760

## 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: 967581

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	231255	23.900325
1	MODIFIES	231255	23.900325
2	UPDATES	148162	15.312620
3	CREATES	57605	5.953507
4	INVOKES	35760	3.695815
5	DELETES	35346	3.653027
6	COMMITTED	23314	2.409514
7	DEPENDS_ON	21459	2.217799
8	OF_TYPE	21292	2.200539
9	DECLARES	20648	2.133982
10	OF_RAW_TYPE	17041	1.761196
11	HAS_PARENT	14171	1.464580
12	HAS	14057	1.452798
13	RETURNS	12524	1.294362
14	RENAMES	9858	1.018829
15	READS	9068	0.937183
16	HAS_ACTUAL_TYPE_ARGUMENT	8261	0.853779
17	HAS_NEW_NAME	6161	0.636743
18	OF_GENERIC_TYPE	5892	0.608941
19	RESOLVES_TO	5242	0.541763
20	SIMILAR	3915	0.404617
21	CONTAINS	3797	0.392422
22	WRITES	3796	0.392319
23	RETURNS_GENERIC	3538	0.365654
24	ANNOTATED_BY	2801	0.289485
25	REQUIRES	2172	0.224477
26	HAS_FIRST_CHILD	2144	0.221584
27	HAS_LAST_CHILD	2144	0.221584
28	HAS_ELEMENT	2126	0.219723
29	HAS_UPPER_BOUND	1519	0.156989

## 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.

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Relationship types (more than 0.5% overall)

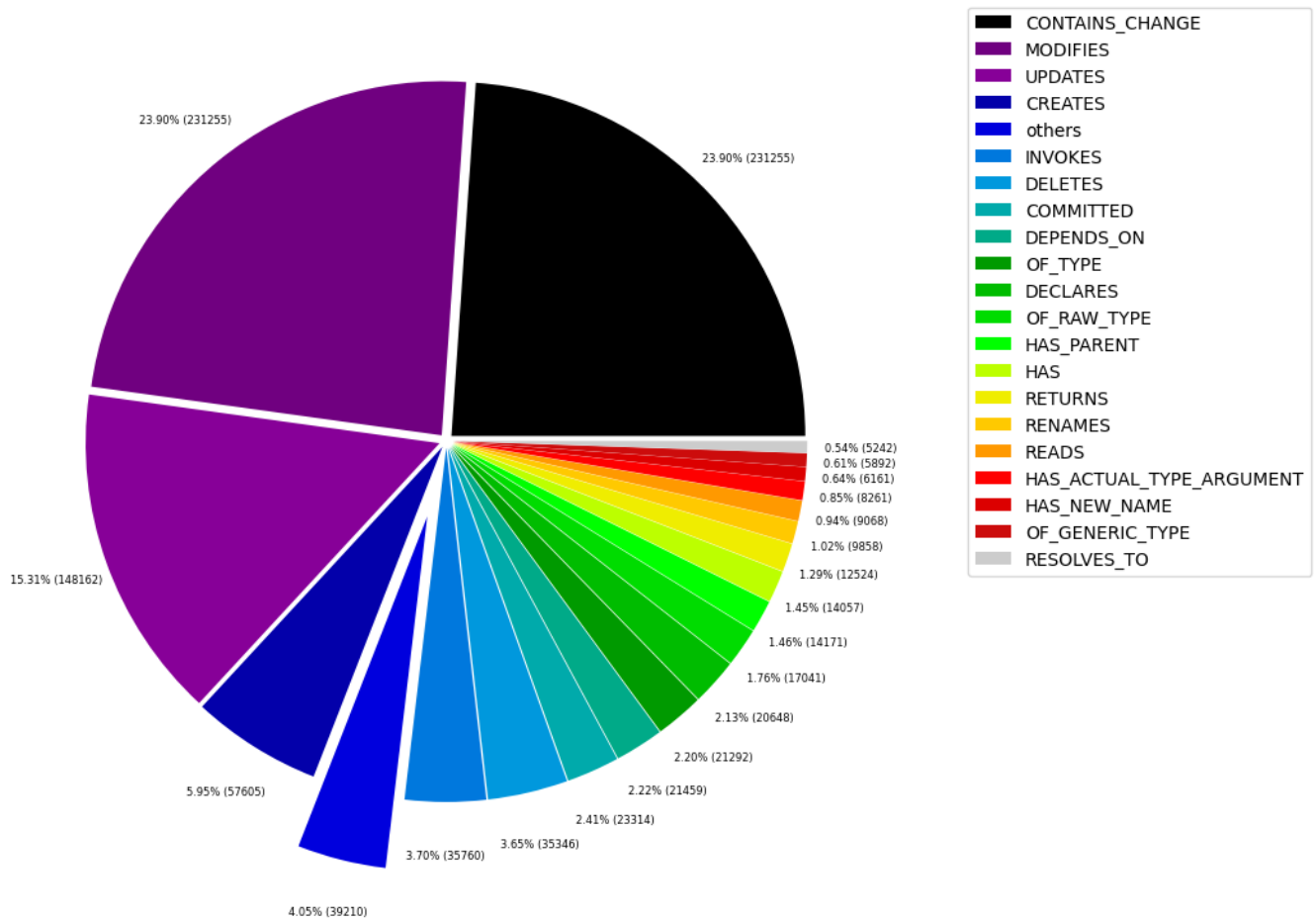


Table 2b - Lowest relationship count by type

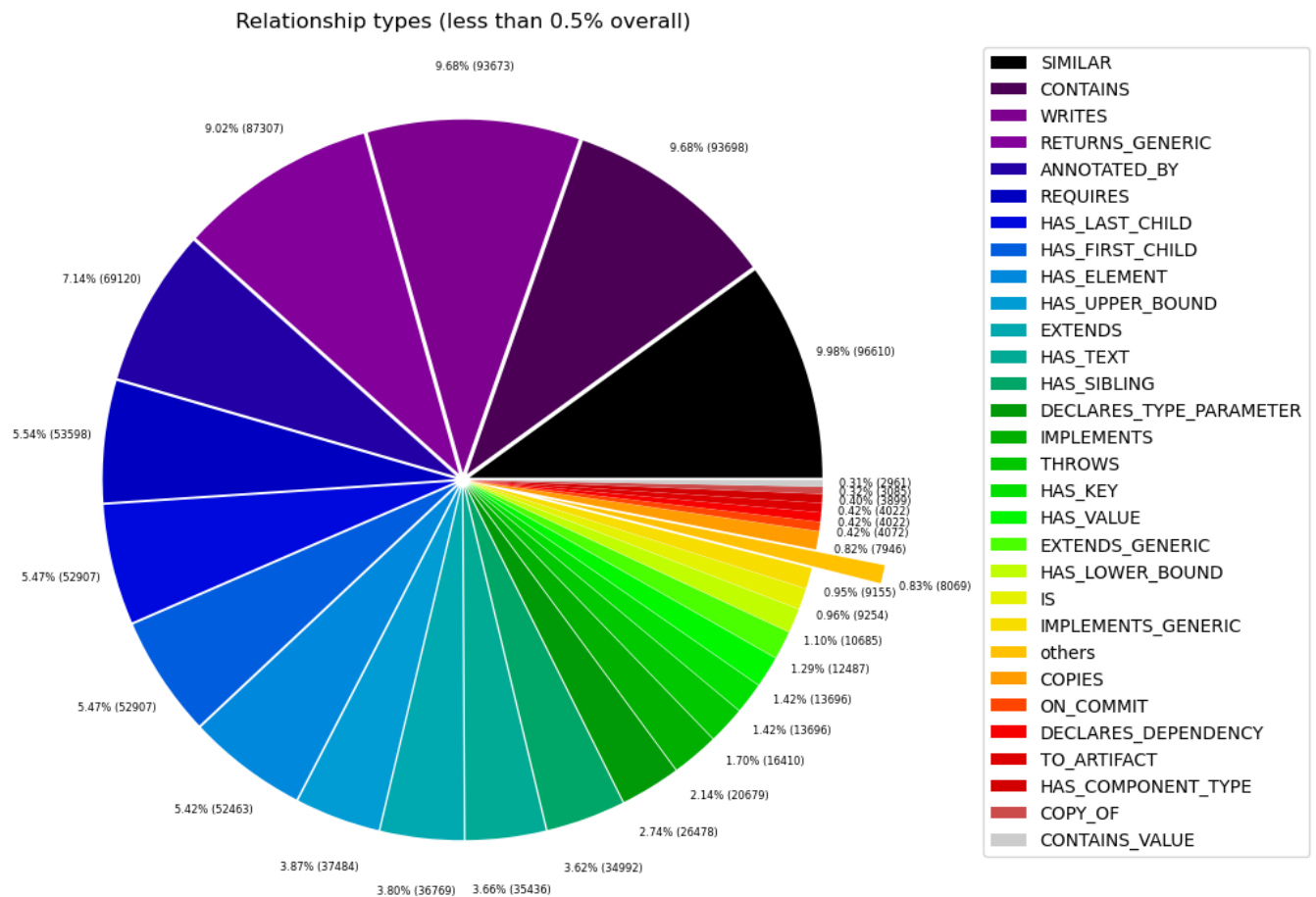
Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000103
1	THROWS_GENERIC	5	0.000517
2	EXCLUDES	5	0.000517
3	DESCRIBES	9	0.000930
4	HAS_ROOT_ELEMENT	11	0.001137
5	HAS_GOAL	16	0.001654
6	HAS_EXECUTION	16	0.001654
7	OF_NAMESPACE	18	0.001860
8	HAS_ATTRIBUTE	18	0.001860
9	INCLUDES_CONCEPT	19	0.001964
10	USES_PLUGIN	21	0.002170
11	REQUIRES_TYPE_PARAMETER	21	0.002170
12	IS_ARTIFACT	21	0.002170
13	HAS_CONFIGURATION	21	0.002170
14	HAS_HEAD	25	0.002584
15	REQUIRES_CONCEPT	28	0.002894
16	DECLARES_NAMESPACE	36	0.003721
17	HAS_DEFAULT	36	0.003721
18	CONTAINS_VALUE	120	0.012402
19	COPY_OF	125	0.012919
20	HAS_COMPONENT_TYPE	158	0.016329
21	TO_ARTIFACT	163	0.016846
22	DECLARES_DEPENDENCY	163	0.016846
23	ON_COMMIT	165	0.017053
24	COPIES	322	0.033279
25	IMPLEMENTS_GENERIC	371	0.038343
26	IS	375	0.038756
27	HAS_LOWER_BOUND	433	0.044751
28	EXTENDS_GENERIC	506	0.052295
29	HAS_VALUE	555	0.057360

## 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]	231255	11657	
1	[Git, Change]	MODIFIES	[File, Git]	231255	231255	
2	[Git, Change]	UPDATES	[File, Git]	148162	231255	
3	[Git, Change]	CREATES	[File, Git]	57605	231255	
4	[Git, Change]	DELETES	[File, Git]	35346	231255	
5	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	21884	13076	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14162	11657	
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11657	288	
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11657	242	
9	[Git, Change]	RENAMES	[File, Git]	9858	231255	
10	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	8290	13076	
11	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	8125	13076	
12	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6335	12968	
13	[File, Git]	HAS_NEW_NAME	[File, Git]	6161	10572	
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, Constructor, Method, Member]	WRITES	[Java, ByteCode, Member, Field]	2423	2034	
20	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalType, Ext...	2336	2813	
21	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126	2144	
22	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2106	2034	
23	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2088	13076	
24	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2034	13076	
25	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	2021	2034	
26	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2020	12968	
27	[Java, ByteCode, Method, Member, Lambda]	INVOKES	[Java, ByteCode, Method, Member]	1866	931	
28	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound]	1792	7154	
29	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	1790	2034	

## Graph Density

```
total_number_of_nodes (vertices): 319227
total_number_of_relationships (edges): 967581
-> total directed graph density: 9.494879534760472e-06
-> total directed graph density in percent: 0.0009494879534760472
```