

# 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: 319220

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	231259	72.445022
1	[Java, ByteCode, Method, Member]	13174	4.126934
2	[Java, ByteCode, Parameter]	12968	4.062402
3	[Git, Commit]	11659	3.652340
4	[File, Git]	10572	3.311823
5	[Java, ByteCode, Bound, ParameterizedType]	7154	2.241088
6	[Java, ByteCode, Bound]	7094	2.222292
7	[Java, ByteCode, Member, Field]	3483	1.091097
8	[Java, ByteCode, Bound, WildcardType]	2902	0.909091
9	[Java, Value, ByteCode, Annotation]	2813	0.881210
10	[Xml, Element]	2144	0.671637
11	[Java, ByteCode, Constructor, Method, Member]	2037	0.638118
12	[Xml, Text]	1436	0.449847
13	[Java, ByteCode, Bound, TypeVariable]	1094	0.342710
14	[Java, ByteCode, Method, Member, Lambda]	931	0.291648
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	899	0.281624
16	[Type, File, Java, ByteCode, Class]	858	0.268780
17	[Type, File, Java, ByteCode, JavaType]	746	0.233695
18	[Java, Value, ByteCode, Primitive]	647	0.202682
19	[Java, ByteCode, Method, Member, GenericDeclar...	567	0.177620
20	[Json, Key]	555	0.173861
21	[Value, Json, Scalar]	539	0.168849
22	[Type, File, Java, ByteCode, ExternalType]	396	0.124052
23	[Author, Git, Person]	288	0.090220
24	[Value, Array]	267	0.083641
25	[Committer, Git, Person]	242	0.075810
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.073930
27	[Value, Property]	202	0.063279
28	[Type, File, Java, ByteCode, Interface]	186	0.058267
29	[Java, Value, ByteCode, Class]	170	0.053255

## 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)

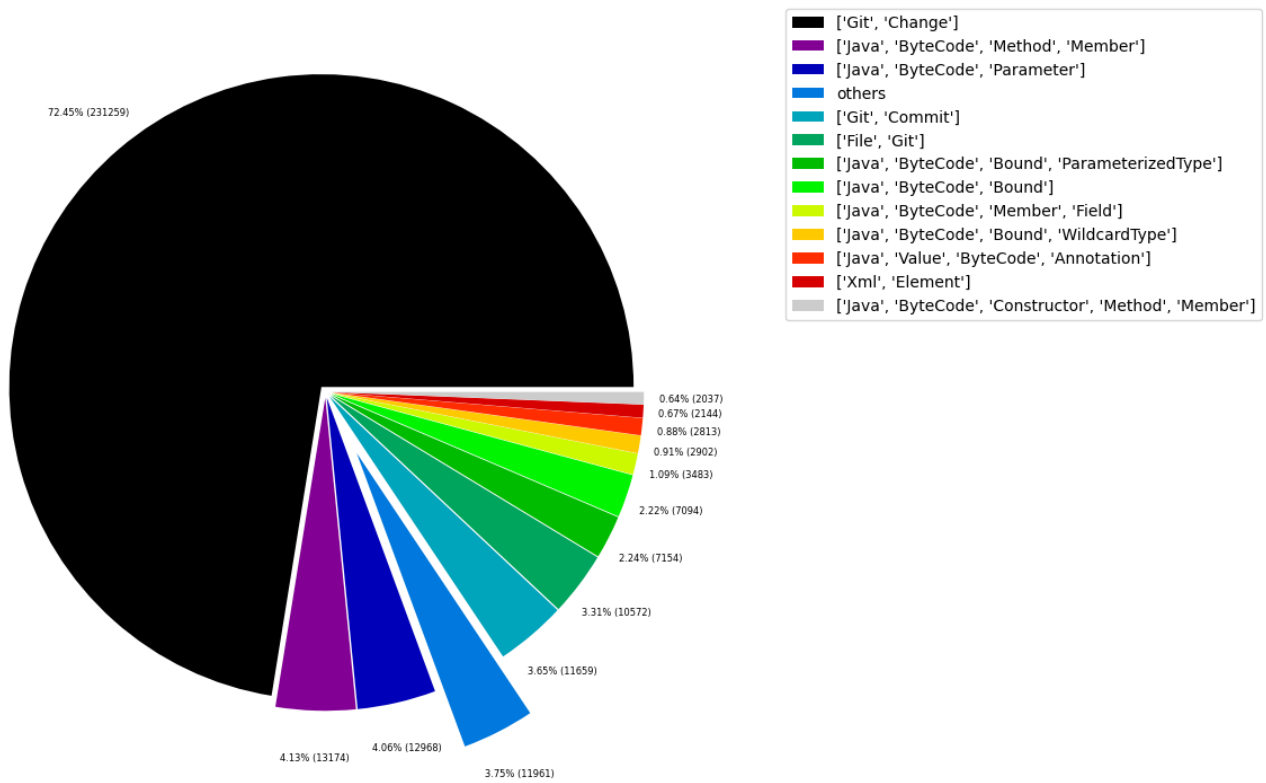


Table 1b - Lowest node count by label combination

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, Xml, Maven, 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	0.006579
19	[Maven, Configuration]	21	0.006579
20	[Git, Branch]	25	0.007832
21	[Type, File, Java, ByteCode, Enum]	28	0.008771
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.009085
23	[Xml, Namespace]	36	0.011277
24	[Type, File, Java, ByteCode, Annotation]	43	0.013470
25	[File, Directory]	44	0.013784
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.026627
27	[Artifact, Maven]	92	0.028820
28	[Type, File, Java, ByteCode, ExternalType, Ext...	93	0.029134
29	[Value, ManifestEntry]	120	0.037592

## 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)

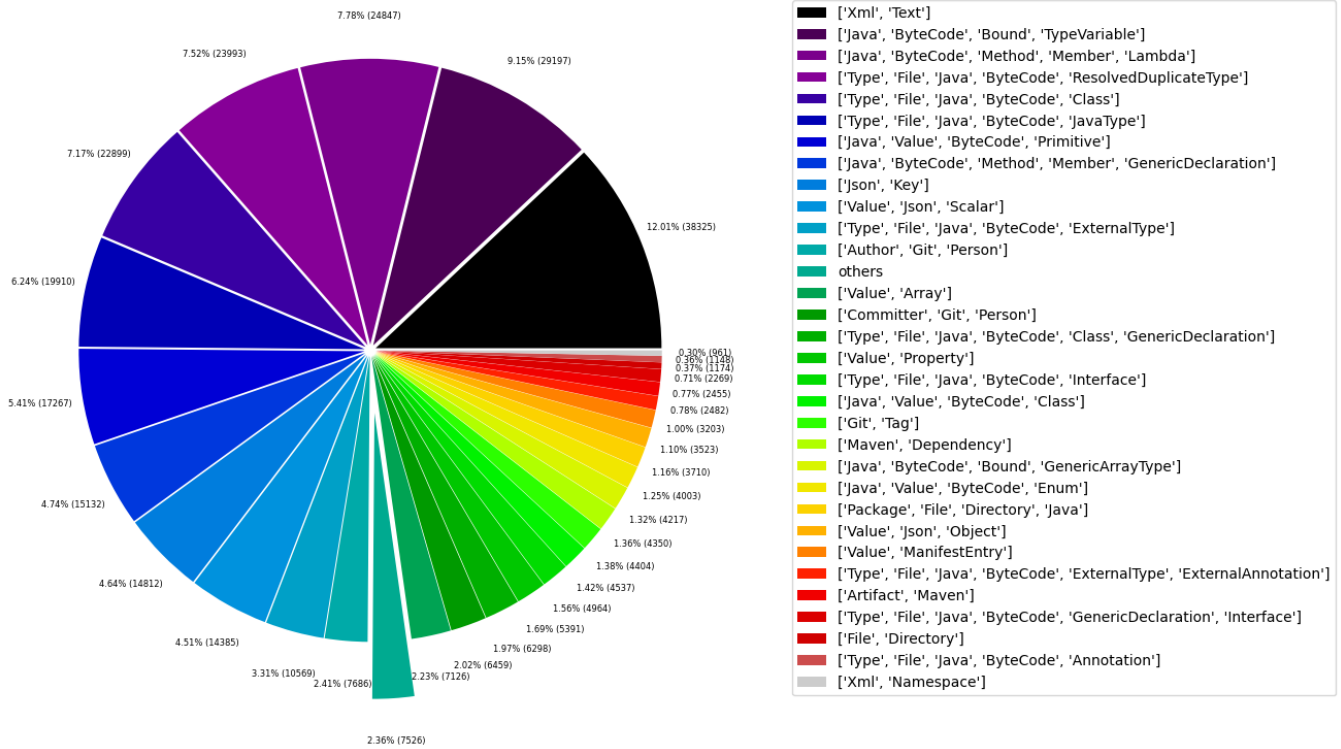


Table 1c - Highest node count by single label

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.

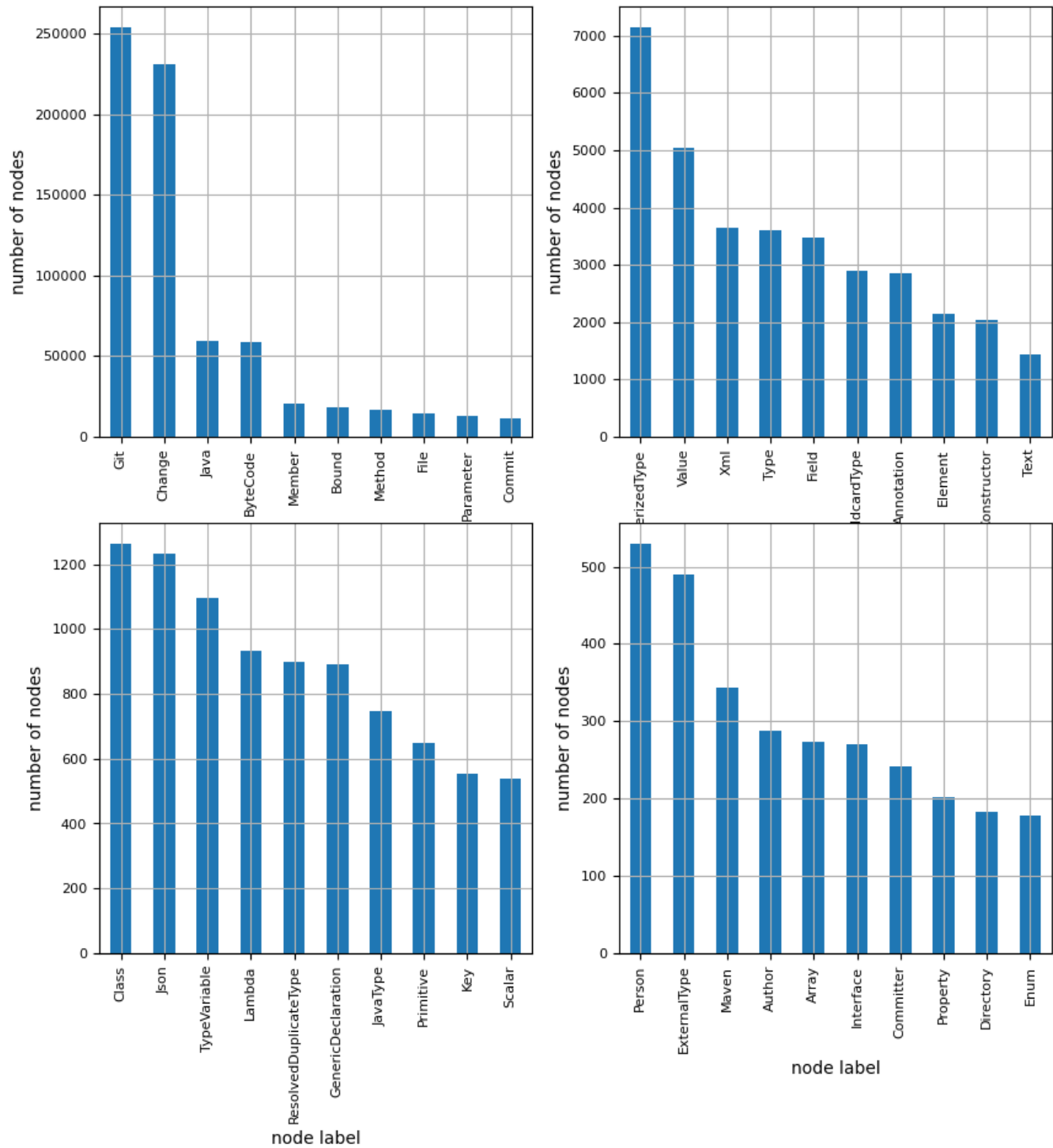
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	254210	79.634735
1	Change	231259	72.445022
2	Java	59142	18.527035
3	ByteCode	58954	18.468141
4	Member	20196	6.326671
5	Bound	18402	5.764676
6	Method	16713	5.235574
7	File	14418	4.516634
8	Parameter	12968	4.062402
9	Commit	11659	3.652340
10	ParameterizedType	7154	2.241088
11	Value	5046	1.580728
12	Xml	3643	1.141219
13	Type	3608	1.130255
14	Field	3483	1.091097
15	WildcardType	2902	0.909091
16	Annotation	2856	0.894681
17	Element	2144	0.671637
18	Constructor	2041	0.639371
19	Text	1436	0.449847
20	Class	1264	0.395965
21	Json	1234	0.386567
22	TypeVariable	1094	0.342710
23	Lambda	931	0.291648
24	ResolvedDuplicateType	899	0.281624
25	GenericDeclaration	892	0.279431
26	JavaType	746	0.233695
27	Primitive	647	0.202682
28	Key	555	0.173861
29	Scalar	539	0.168849
30	Person	530	0.166030
31	ExternalType	489	0.153186
32	Maven	343	0.107449
33	Author	288	0.090220
34	Array	273	0.085521
35	Interface	271	0.084894
36	Committer	242	0.075810
37	Property	202	0.063279
38	Directory	183	0.057327
39	Enum	178	0.055761

## 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: 967282

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	231259	23.908126
1	MODIFIES	231259	23.908126
2	UPDATES	148166	15.317767
3	CREATES	57605	5.955347
4	INVOKES	35487	3.668734
5	DELETES	35346	3.654157
6	COMMITTED	23318	2.410672
7	DEPENDS_ON	21459	2.218484
8	OF_TYPE	21292	2.201219
9	DECLARES	20635	2.133297
10	OF_RAW_TYPE	17041	1.761741
11	HAS_PARENT	14174	1.465343
12	HAS	14057	1.453247
13	RETURNS	12524	1.294762
14	RENAMES	9858	1.019144
15	READS	9068	0.937472
16	HAS_ACTUAL_TYPE_ARGUMENT	8261	0.854043
17	HAS_NEW_NAME	6161	0.636939
18	OF_GENERIC_TYPE	5892	0.609129
19	RESOLVES_TO	5210	0.538623
20	SIMILAR	3915	0.404742
21	CONTAINS	3797	0.392543
22	WRITES	3796	0.392440
23	RETURNS_GENERIC	3538	0.365767
24	ANNOTATED_BY	2801	0.289574
25	REQUIRES	2172	0.224547
26	HAS_FIRST_CHILD	2144	0.221652
27	HAS_LAST_CHILD	2144	0.221652
28	HAS_ELEMENT	2126	0.219791
29	HAS_UPPER_BOUND	1519	0.157038

## 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)

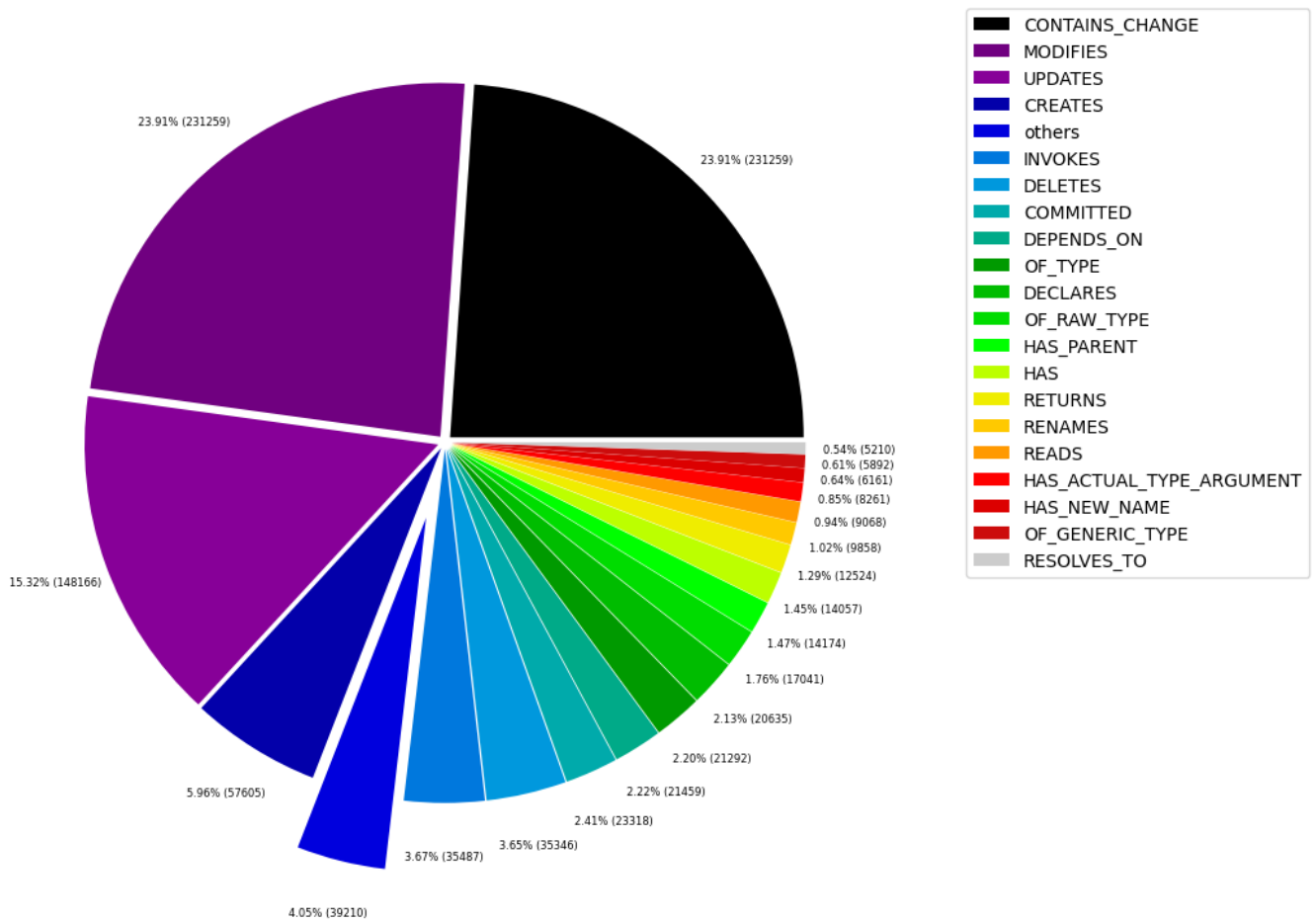


Table 2b - Lowest relationship count by type

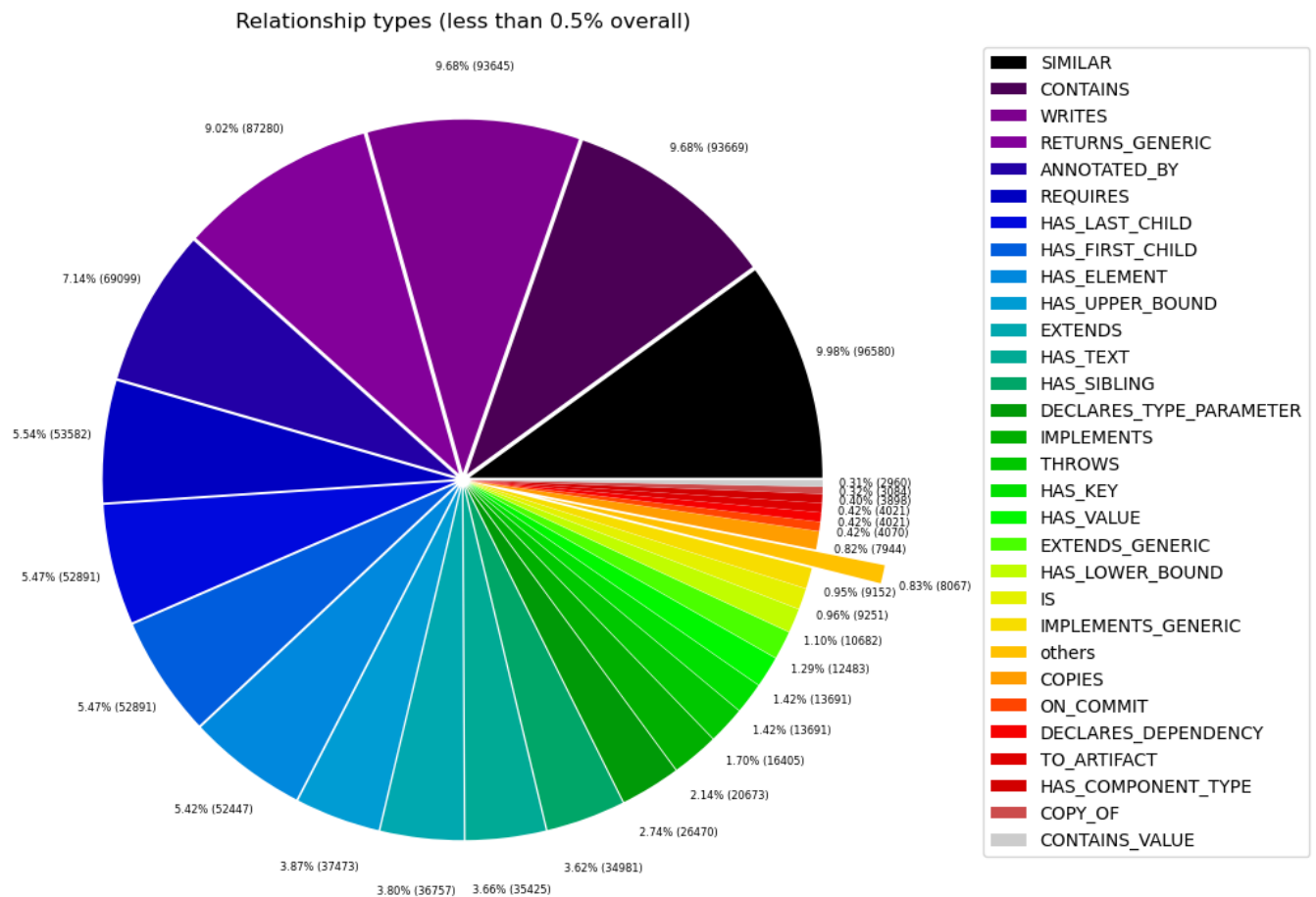
Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000103
1	THROWS_GENERIC	5	0.000517
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	0.001861
8	HAS_ATTRIBUTE	18	0.001861
9	INCLUDES_CONCEPT	19	0.001964
10	USES_PLUGIN	21	0.002171
11	REQUIRES_TYPE_PARAMETER	21	0.002171
12	IS_ARTIFACT	21	0.002171
13	HAS_CONFIGURATION	21	0.002171
14	HAS_HEAD	25	0.002585
15	REQUIRES_CONCEPT	28	0.002895
16	DECLARES_NAMESPACE	36	0.003722
17	HAS_DEFAULT	36	0.003722
18	CONTAINS_VALUE	120	0.012406
19	COPY_OF	125	0.012923
20	HAS_COMPONENT_TYPE	158	0.016334
21	TO_ARTIFACT	163	0.016851
22	DECLARES_DEPENDENCY	163	0.016851
23	ON_COMMIT	165	0.017058
24	COPIES	322	0.033289
25	IMPLEMENTS_GENERIC	371	0.038355
26	IS	375	0.038768
27	HAS_LOWER_BOUND	433	0.044765
28	EXTENDS_GENERIC	506	0.052312
29	HAS_VALUE	555	0.057377

## 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]	231259	11659	
1	[Git, Change]	MODIFIES	[File, Git]	231259	231259	
2	[Git, Change]	UPDATES	[File, Git]	148166	231259	
3	[Git, Change]	CREATES	[File, Git]	57605	231259	
4	[Git, Change]	DELETES	[File, Git]	35346	231259	
5	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	21556	13054	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14165	11659	
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11659	288	
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11659	242	
9	[Git, Change]	RENAMES	[File, Git]	9858	231259	
10	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	8282	13054	
11	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	8123	13054	
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	2037	
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]	2102	2037	
23	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2088	13054	
24	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2032	13054	
25	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	2021	2037	
26	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2020	12968	
27	[Java, ByteCode, Method, Member, Lambda]	INVOKES	[Java, ByteCode, Method, Member]	1859	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]	1785	2037	

## Graph Density

```
total_number_of_nodes (vertices): 319220
total_number_of_relationships (edges): 967282
-> total directed graph density: 9.49236173807107e-06
-> total directed graph density in percent: 0.0009492361738071071
```