

# 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: 321907

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	233757	72.616315
1	[Java, ByteCode, Member, Method]	13204	4.101806
2	[Java, ByteCode, Parameter]	12968	4.028493
3	[Git, Commit]	11775	3.657889
4	[File, Git]	10597	3.291945
5	[Java, ByteCode, Bound, ParameterizedType]	7154	2.222381
6	[Java, ByteCode, Bound]	7094	2.203742
7	[Java, ByteCode, Member, Field]	3491	1.084475
8	[Java, ByteCode, Bound, WildcardType]	2902	0.901503
9	[Java, Value, ByteCode, Annotation]	2813	0.873855
10	[Xml, Element]	2144	0.666031
11	[Java, ByteCode, Member, Constructor, Method]	2044	0.634966
12	[Xml, Text]	1436	0.446092
13	[Java, ByteCode, Bound, TypeVariable]	1094	0.339850
14	[Java, ByteCode, Member, Method, Lambda]	931	0.289214
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	899	0.279273
16	[Type, File, Java, Class, ByteCode]	858	0.266537
17	[Type, File, Java, ByteCode, JavaType]	746	0.231744
18	[Java, Value, ByteCode, Primitive]	647	0.200990
19	[Java, ByteCode, Member, Method, GenericDeclar...	567	0.176138
20	[Json, Key]	555	0.172410
21	[Value, Json, Scalar]	539	0.167440
22	[Type, File, Java, ByteCode, ExternalType]	396	0.123017
23	[Author, Git, Person]	289	0.089777
24	[Value, Array]	267	0.082943
25	[Committer, Git, Person]	243	0.075488
26	[Type, File, Java, Class, ByteCode, GenericDec...	236	0.073313
27	[Value, Property]	202	0.062751
28	[Type, File, Java, ByteCode, Interface]	186	0.057781
29	[Java, Value, Class, ByteCode]	170	0.052810

## 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)

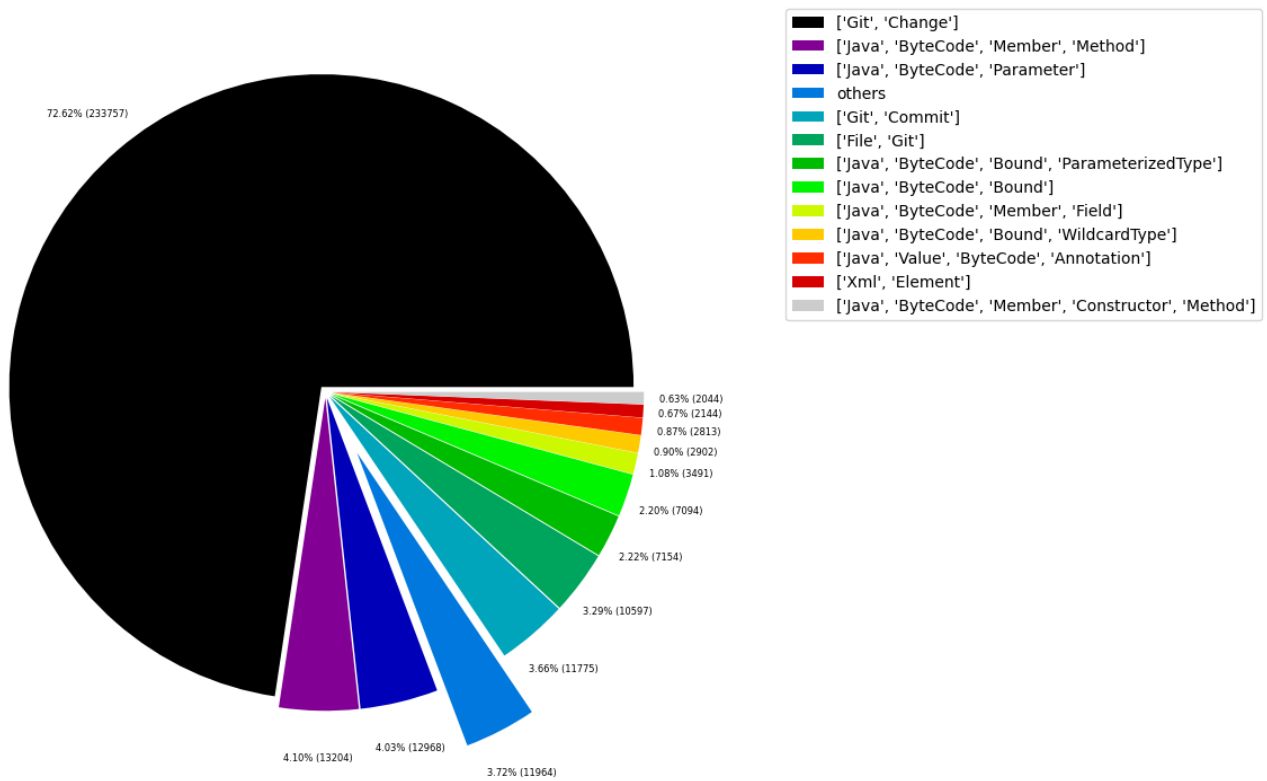


Table 1b - Lowest node count by label combination

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	0.000621
3	[File]	3	0.000932
4	[Java, ByteCode, Member, Constructor, Method, ...]	4	0.001243
5	[Maven, Exclusion]	5	0.001553
6	[Value, Array, Json]	6	0.001864
7	[Type, File, Java, ByteCode, Void]	9	0.002796
8	[File, Maven, Xml, Pom, Document]	9	0.002796
9	[Java, ManifestSection]	9	0.002796
10	[File, Java, Manifest]	9	0.002796
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002796
12	[File, Java, ServiceLoader]	10	0.003106
13	[File, Java, Properties]	12	0.003728
14	[Maven, ExecutionGoal]	16	0.004970
15	[Maven, PluginExecution]	16	0.004970
16	[Xml, Attribute]	18	0.005592
17	[jQAssistant, Rule, Concept]	19	0.005902
18	[Maven, Plugin]	21	0.006524
19	[Maven, Configuration]	21	0.006524
20	[Git, Branch]	24	0.007456
21	[Type, File, Java, ByteCode, Enum]	28	0.008698
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.009009
23	[Xml, Namespace]	36	0.011183
24	[Type, File, Java, ByteCode, Annotation]	43	0.013358
25	[File, Directory]	44	0.013669
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.026405
27	[Artifact, Maven]	92	0.028580
28	[Type, File, Java, ByteCode, ExternalAnnotatio...	93	0.028890
29	[Value, ManifestEntry]	120	0.037278

## 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)

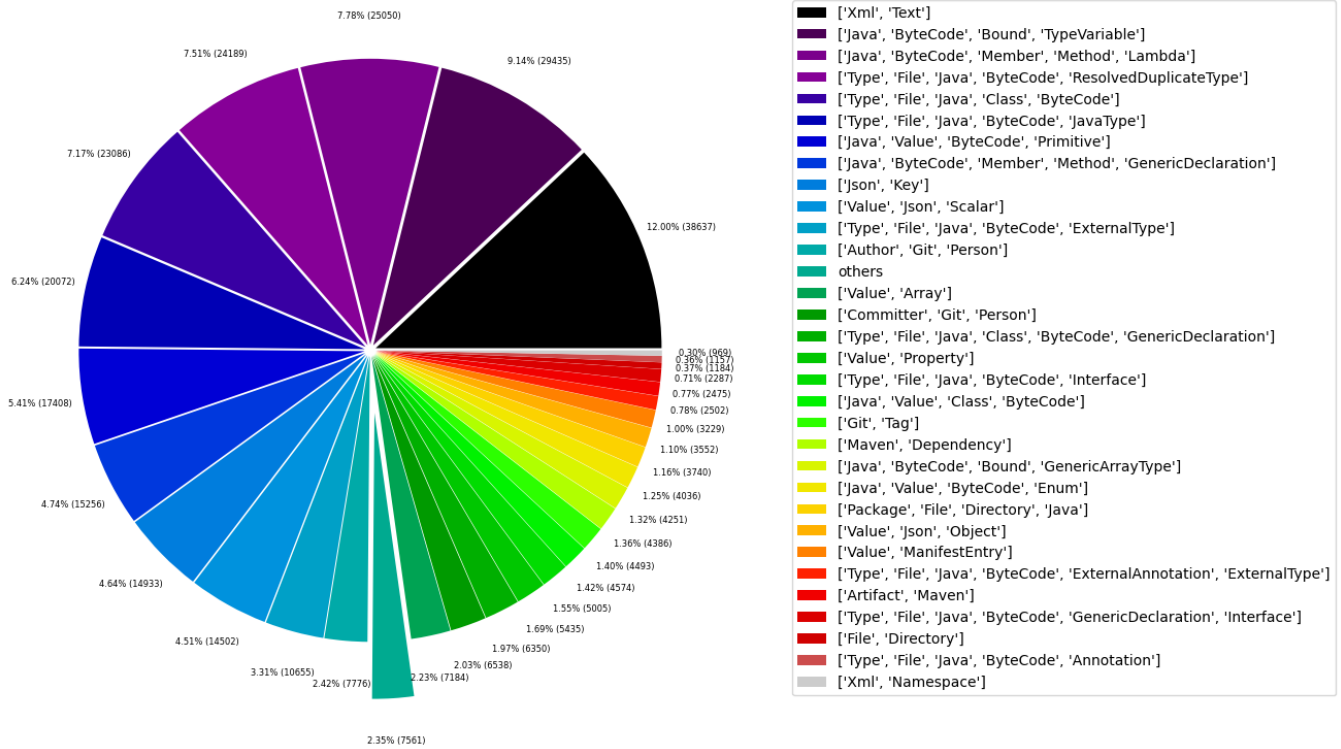


Table 1c - Highest node count by single label

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.

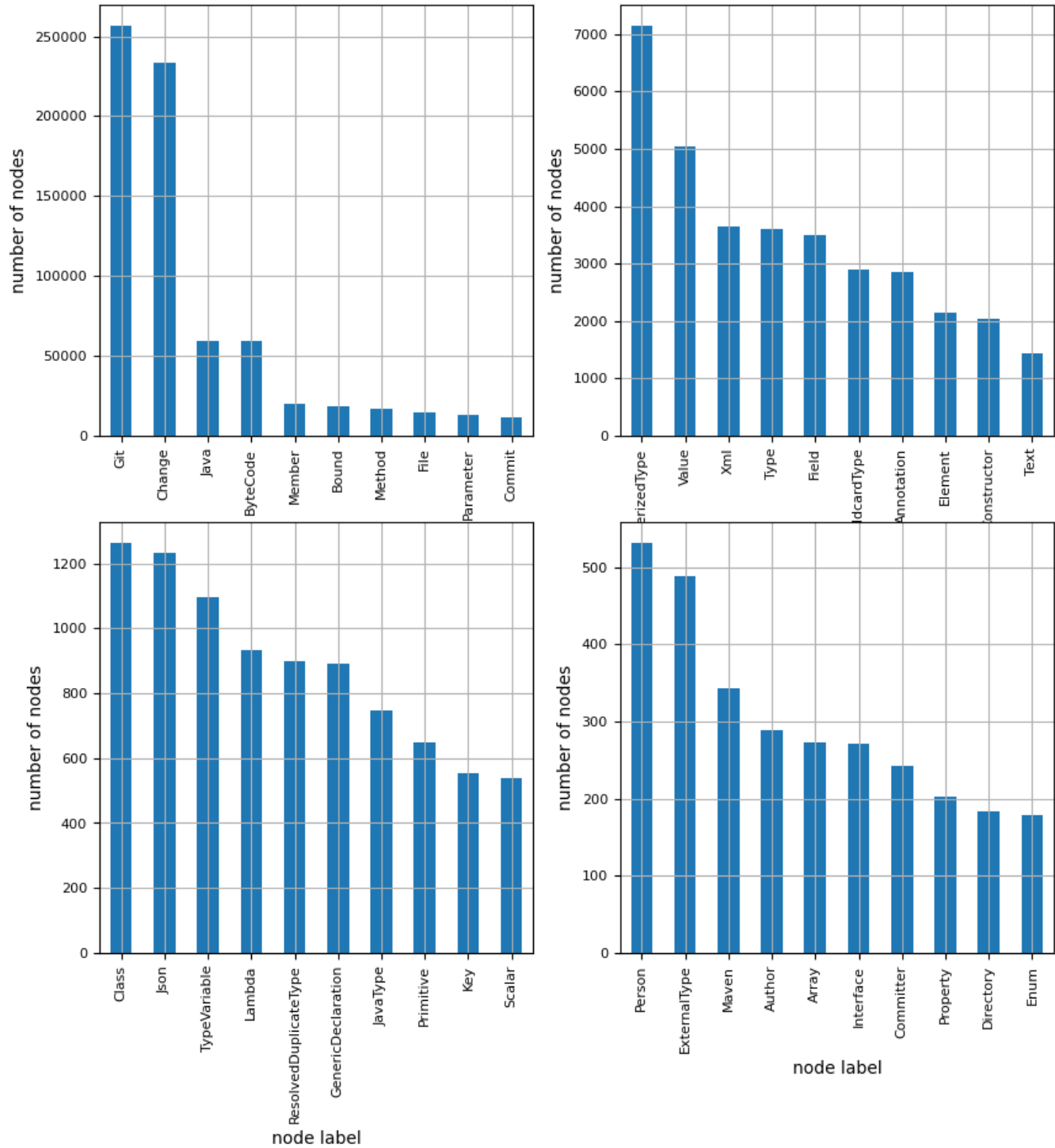
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	256852	79.790747
1	Change	233757	72.616315
2	Java	59187	18.386366
3	ByteCode	58999	18.327964
4	Member	20241	6.287841
5	Bound	18402	5.716558
6	Method	16750	5.203366
7	File	14443	4.486700
8	Parameter	12968	4.028493
9	Commit	11775	3.657889
10	ParameterizedType	7154	2.222381
11	Value	5046	1.567533
12	Xml	3643	1.131693
13	Type	3608	1.120821
14	Field	3491	1.084475
15	WildcardType	2902	0.901503
16	Annotation	2856	0.887213
17	Element	2144	0.666031
18	Constructor	2048	0.636209
19	Text	1436	0.446092
20	Class	1264	0.392660
21	Json	1234	0.383341
22	TypeVariable	1094	0.339850
23	Lambda	931	0.289214
24	ResolvedDuplicateType	899	0.279273
25	GenericDeclaration	892	0.277099
26	JavaType	746	0.231744
27	Primitive	647	0.200990
28	Key	555	0.172410
29	Scalar	539	0.167440
30	Person	532	0.165265
31	ExternalType	489	0.151907
32	Maven	343	0.106553
33	Author	289	0.089777
34	Array	273	0.084807
35	Interface	271	0.084186
36	Committer	243	0.075488
37	Property	202	0.062751
38	Directory	183	0.056849
39	Enum	178	0.055295

## 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: 975790

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	233757	23.955667
1	MODIFIES	233757	23.955667
2	UPDATES	150076	15.379949
3	CREATES	57924	5.936113
4	DELETES	35673	3.655807
5	INVOKES	35534	3.641562
6	COMMITTED	23550	2.413429
7	DEPENDS_ON	21820	2.236137
8	OF_TYPE	21292	2.182027
9	DECLARES	20680	2.119308
10	OF_RAW_TYPE	17041	1.746380
11	HAS_PARENT	14309	1.466402
12	HAS	14057	1.440576
13	RETURNS	12524	1.283473
14	RENAMES	9916	1.016202
15	READS	9069	0.929401
16	HAS_ACTUAL_TYPE_ARGUMENT	8261	0.846596
17	HAS_NEW_NAME	6165	0.631796
18	OF_GENERIC_TYPE	5892	0.603818
19	RESOLVES_TO	5241	0.537103
20	SIMILAR	3955	0.405313
21	CONTAINS	3797	0.389121
22	WRITES	3796	0.389018
23	RETURNS_GENERIC	3538	0.362578
24	ANNOTATED_BY	2801	0.287049
25	REQUIRES	2172	0.222589
26	HAS_FIRST_CHILD	2144	0.219719
27	HAS_LAST_CHILD	2144	0.219719
28	HAS_ELEMENT	2126	0.217875
29	HAS_UPPER_BOUND	1519	0.155669

## 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)

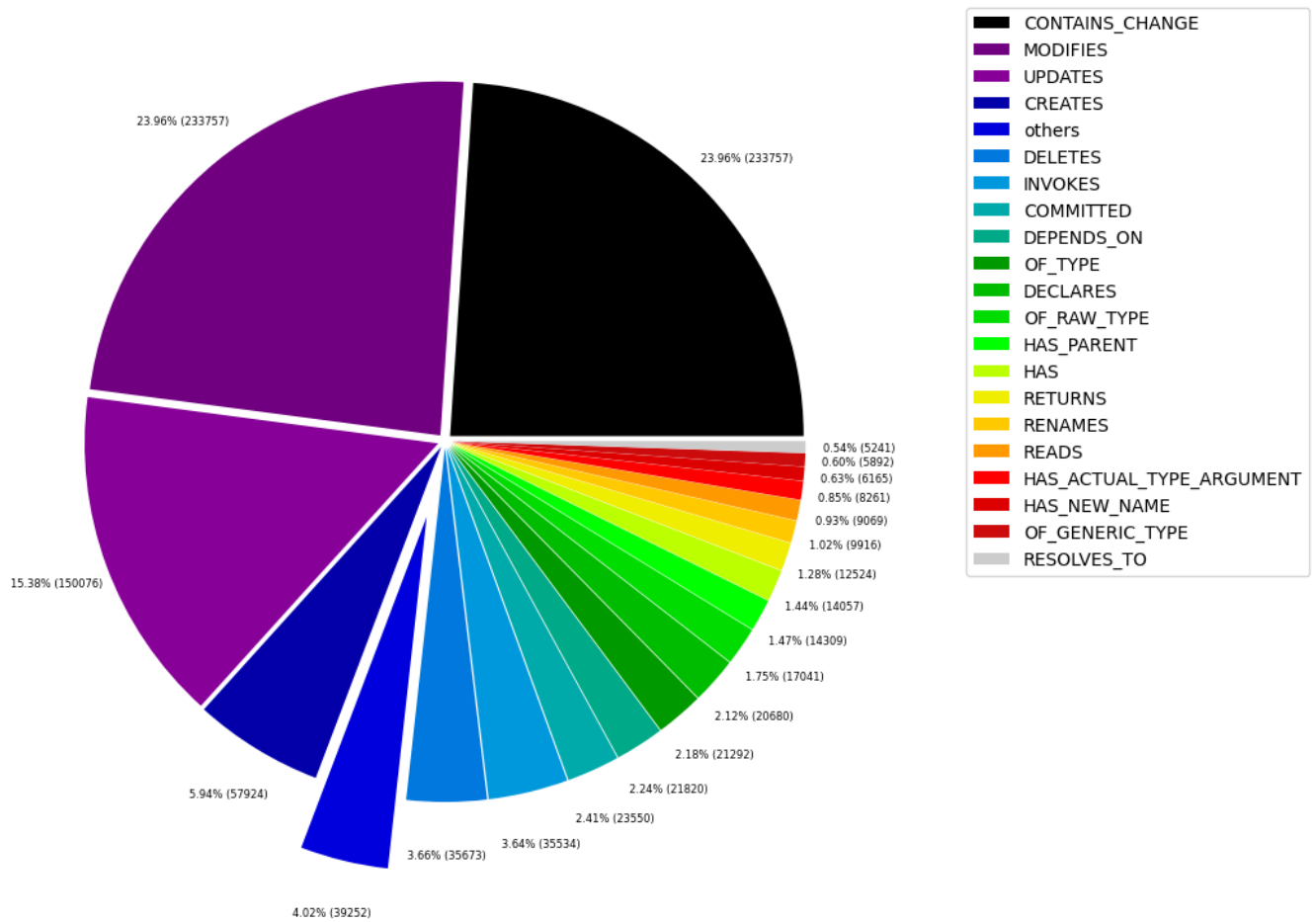


Table 2b - Lowest relationship count by type

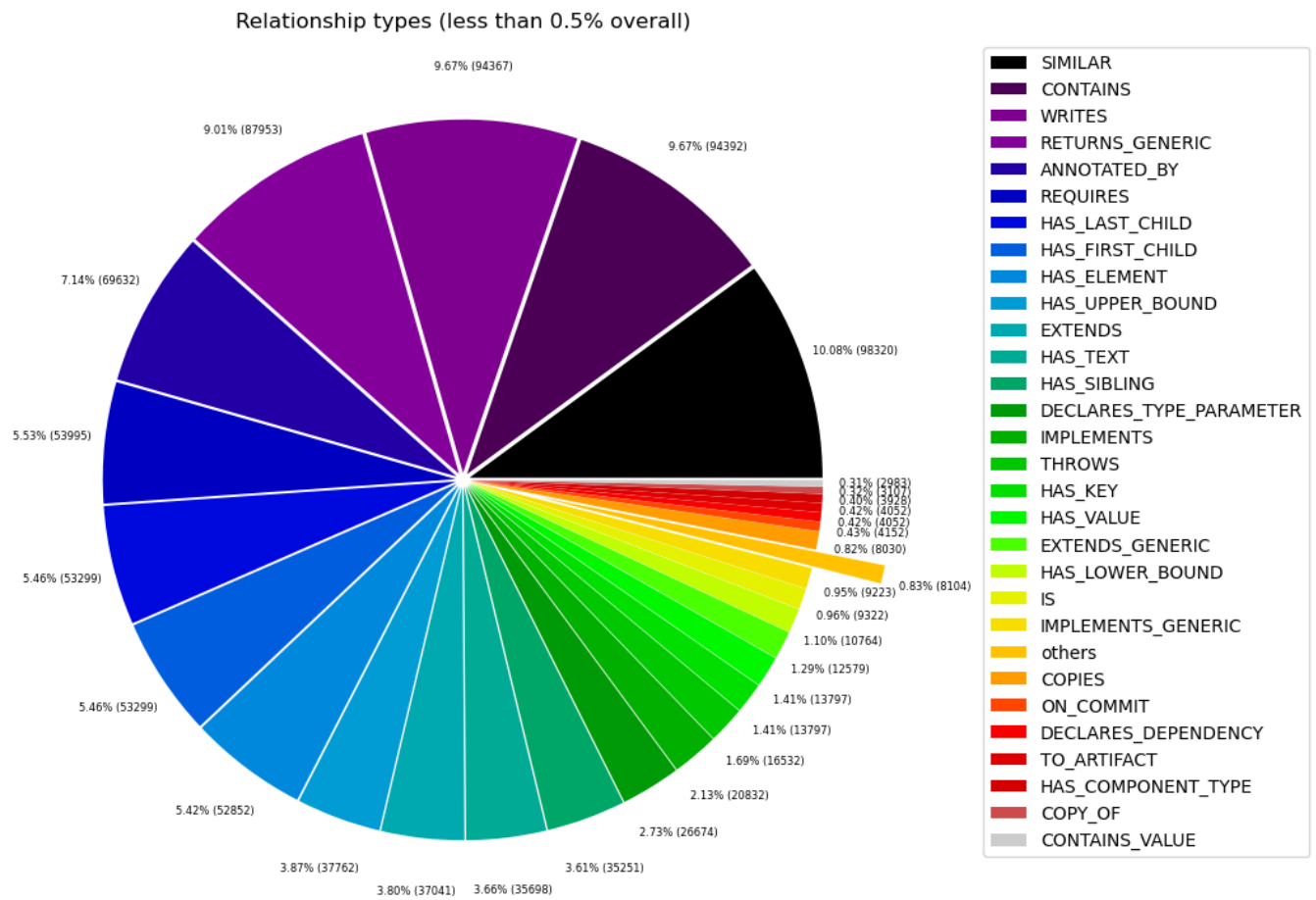
Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000102
1	THROWS_GENERIC	5	0.000512
2	EXCLUDES	5	0.000512
3	DESCRIBES	9	0.000922
4	HAS_ROOT_ELEMENT	11	0.001127
5	HAS_GOAL	16	0.001640
6	HAS_EXECUTION	16	0.001640
7	OF_NAMESPACE	18	0.001845
8	HAS_ATTRIBUTE	18	0.001845
9	INCLUDES_CONCEPT	19	0.001947
10	USES_PLUGIN	21	0.002152
11	REQUIRES_TYPE_PARAMETER	21	0.002152
12	IS_ARTIFACT	21	0.002152
13	HAS_CONFIGURATION	21	0.002152
14	HAS_HEAD	24	0.002460
15	REQUIRES_CONCEPT	28	0.002869
16	DECLARES_NAMESPACE	36	0.003689
17	HAS_DEFAULT	36	0.003689
18	CONTAINS_VALUE	120	0.012298
19	COPY_OF	125	0.012810
20	HAS_COMPONENT_TYPE	158	0.016192
21	TO_ARTIFACT	163	0.016704
22	DECLARES_DEPENDENCY	163	0.016704
23	ON_COMMIT	167	0.017114
24	COPIES	323	0.033101
25	IMPLEMENTS_GENERIC	371	0.038020
26	IS	375	0.038430
27	HAS_LOWER_BOUND	433	0.044374
28	EXTENDS_GENERIC	506	0.051855
29	HAS_VALUE	555	0.056877

## 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]	233757	11775	
1	[Git, Change]	MODIFIES	[File, Git]	233757	233757	
2	[Git, Change]	UPDATES	[File, Git]	150076	233757	
3	[Git, Change]	CREATES	[File, Git]	57924	233757	
4	[Git, Change]	DELETES	[File, Git]	35673	233757	
5	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Method]	21587	13094	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14300	11775	
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11775	289	
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11775	243	
9	[Git, Change]	RENAMES	[File, Git]	9916	233757	
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	10597	
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	2044	
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	2044	
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	2044	
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	2044	
29	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound]	1792	7154	

# Graph Density

```
total_number_of_nodes (vertices): 321907
total_number_of_relationships (edges): 975790
-> total directed graph density: 9.416659585083697e-06
-> total directed graph density in percent: 0.0009416659585083697
```