

# 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: 68842

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Java, ByteCode, Parameter]	11184	16.245896
1	[Java, ByteCode, Method, Member]	10642	15.458586
2	[File, Git, Log]	7804	11.336103
3	[Git, Commit, Log]	7618	11.065919
4	[Java, ByteCode, Bound, ParameterizedType]	6537	9.495657
5	[Java, ByteCode, Bound]	6308	9.163011
6	[Java, ByteCode, Member, Field]	2849	4.138462
7	[Java, ByteCode, Bound, WildcardType]	2722	3.953982
8	[Java, Value, ByteCode, Annotation]	2225	3.232039
9	[Java, ByteCode, Constructor, Method, Member]	1647	2.392435
10	[Xml, Element]	1534	2.228291
11	[Xml, Text]	1016	1.475843
12	[Java, ByteCode, Bound, TypeVariable]	988	1.435170
13	[Java, ByteCode, Method, Member, Lambda]	767	1.114145
14	[Type, File, Java, ByteCode, Class]	699	1.015369
15	[Type, File, Java, ByteCode, JavaType]	596	0.865751
16	[Type, File, Java, ByteCode, ResolvedDuplicate...	542	0.787310
17	[Java, ByteCode, Method, Member, GenericDeclar...	525	0.762616
18	[Java, Value, ByteCode, Primitive]	467	0.678365
19	[Git, Author, Log]	260	0.377676
20	[Type, File, Java, ByteCode, Class, GenericDec...	215	0.312309
21	[Type, File, Java, ByteCode, ExternalType]	194	0.281805
22	[Type, File, Java, ByteCode, Interface]	166	0.241132
23	[Java, ByteCode, Bound, GenericArrayType]	144	0.209175
24	[Java, Value, ByteCode, Enum]	142	0.206269
25	[Maven, Dependency]	116	0.168502
26	[Value, Property]	109	0.158334
27	[Package, File, Directory, Java]	107	0.155428
28	[Value, Array]	104	0.151071
29	[Value, ManifestEntry]	91	0.132187

## 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)

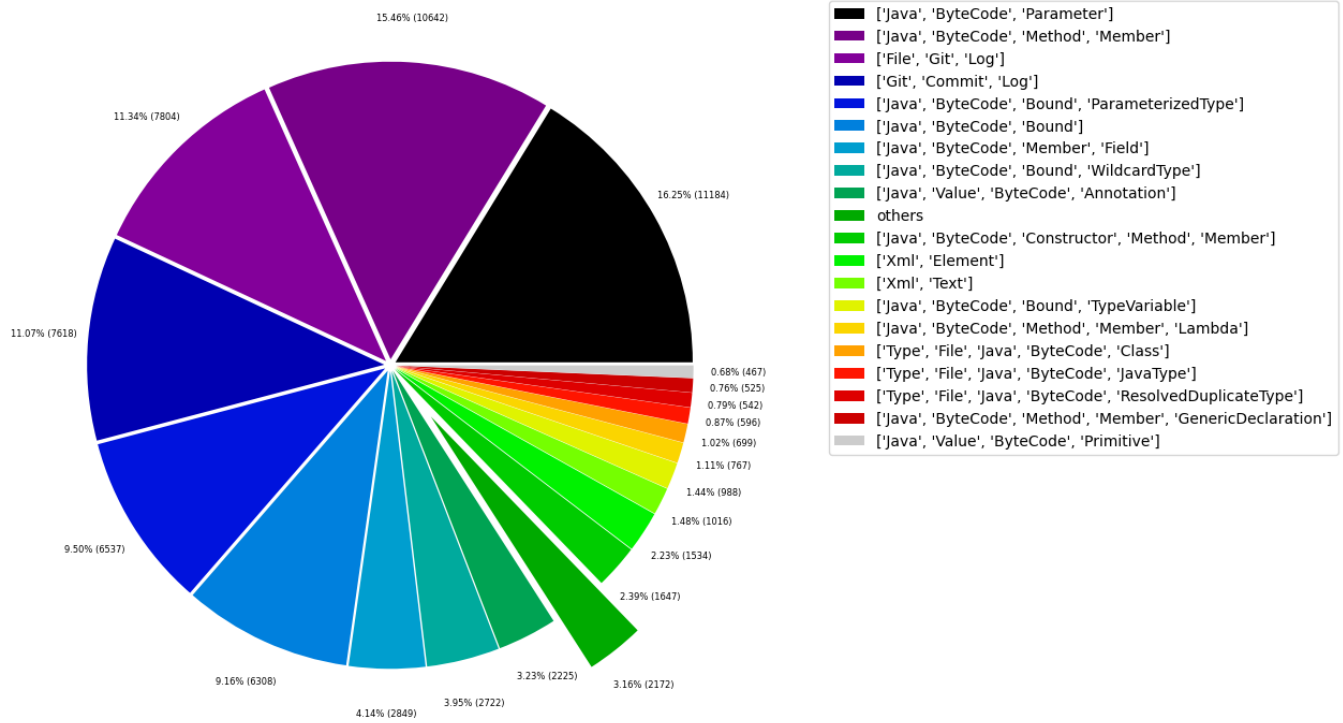


Table 1b - Lowest node count by label combination

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	[Repository, Git]	1	0.001453
1	[Analyze, Task, jQAssistant]	1	0.001453
2	[Maven, Exclusion]	1	0.001453
3	[Java, ByteCode, Constructor, Method, Member, ...]	3	0.004358
4	[File, Xml, Maven, Pom, Document]	6	0.008716
5	[Type, File, Java, ByteCode, Void]	6	0.008716
6	[Java, ManifestSection]	6	0.008716
7	[File, Java, Manifest]	6	0.008716
8	[Artifact, File, Jar, Archive, Zip, Java]	6	0.008716
9	[File, Java, Properties]	8	0.011621
10	[File, Java, ServiceLoader]	9	0.013073
11	[Xml, Attribute]	12	0.017431
12	[Maven, ExecutionGoal]	14	0.020336
13	[Maven, PluginExecution]	14	0.020336
14	[Maven, Plugin]	16	0.023242
15	[Maven, Configuration]	16	0.023242
16	[jQAssistant, Rule, Concept]	19	0.027599
17	[Type, File, Java, ByteCode, PrimitiveType]	21	0.030505
18	[Xml, Namespace]	24	0.034862
19	[Type, File, Java, ByteCode, Enum]	25	0.036315
20	[Java, Value, ByteCode, Class]	28	0.040673
21	[File, Directory]	29	0.042125
22	[Type, File, Java, ByteCode, Annotation]	40	0.058104
23	[Type, File, Java, ByteCode, ExternalType, Ext...	65	0.094419
24	[Artifact, Maven]	69	0.100230
25	[Type, File, Java, ByteCode, GenericDeclaratio...	79	0.114756
26	[Value, ManifestEntry]	91	0.132187
27	[Value, Array]	104	0.151071
28	[Package, File, Directory, Java]	107	0.155428
29	[Value, Property]	109	0.158334

## 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>



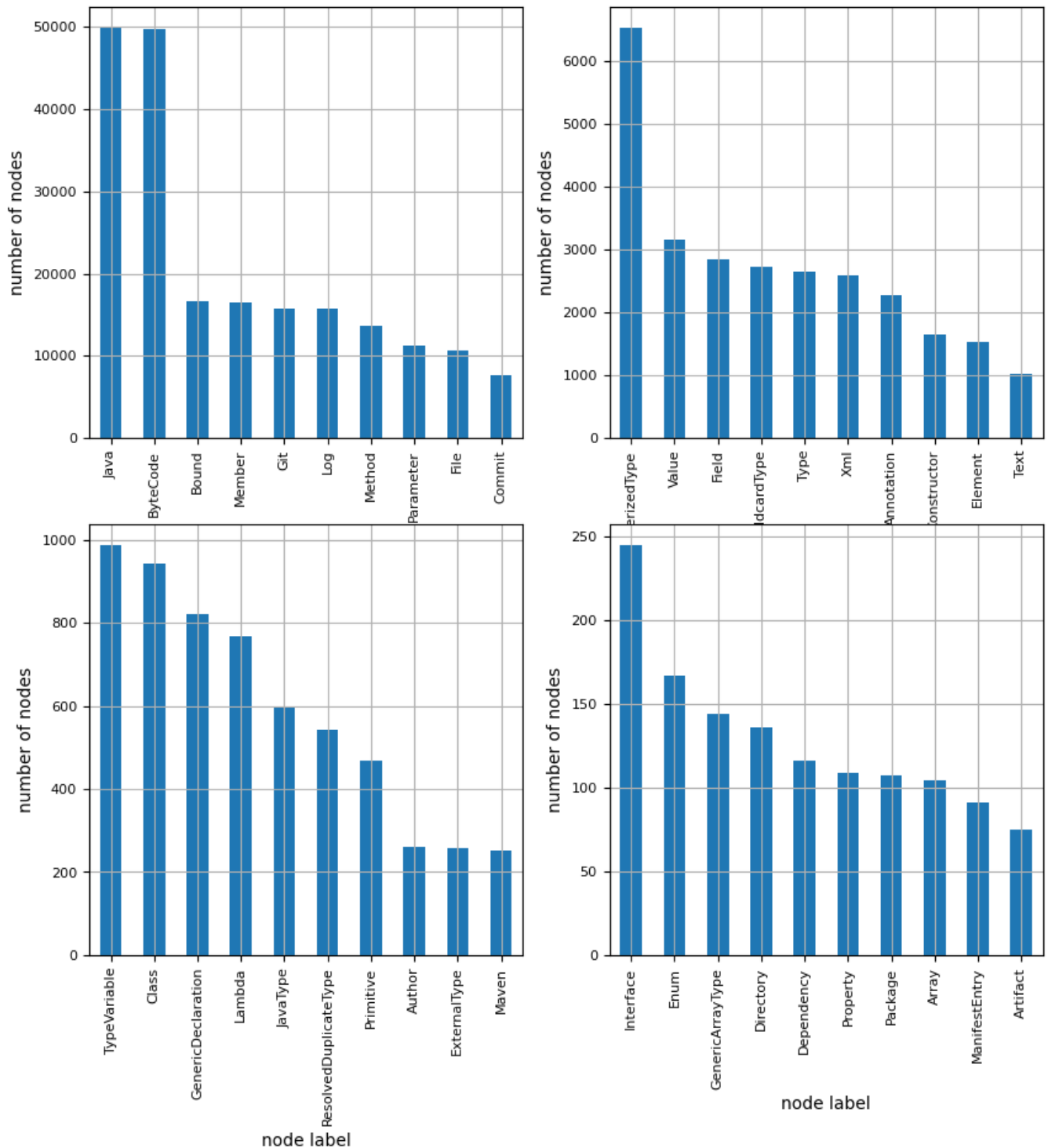
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Java	49968	72.583597
1	ByteCode	49826	72.377328
2	Bound	16699	24.256994
3	Member	16433	23.870602
4	Git	15683	22.781151
5	Log	15682	22.779698
6	Method	13584	19.732140
7	Parameter	11184	16.245896
8	File	10623	15.430987
9	Commit	7618	11.065919
10	ParameterizedType	6537	9.495657
11	Value	3166	4.598937
12	Field	2849	4.138462
13	WildcardType	2722	3.953982
14	Type	2648	3.846489
15	Xml	2592	3.765143
16	Annotation	2265	3.290143
17	Constructor	1650	2.396793
18	Element	1534	2.228291
19	Text	1016	1.475843
20	TypeVariable	988	1.435170
21	Class	942	1.368351
22	GenericDeclaration	822	1.194039
23	Lambda	767	1.114145
24	JavaType	596	0.865751
25	ResolvedDuplicateType	542	0.787310
26	Primitive	467	0.678365
27	Author	260	0.377676
28	ExternalType	259	0.376224
29	Maven	252	0.366056
30	Interface	245	0.355887
31	Enum	167	0.242584
32	GenericArrayType	144	0.209175
33	Directory	136	0.197554
34	Dependency	116	0.168502
35	Property	109	0.158334
36	Package	107	0.155428
37	Array	104	0.151071
38	ManifestEntry	91	0.132187
39	Artifact	75	0.108945

## 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: 247773

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGED	45786	18.479011
1	INVOKES	29618	11.953683
2	OF_TYPE	17618	7.110541
3	DEPENDS_ON	17426	7.033050
4	DECLARES	16795	6.778382
5	OF_RAW_TYPE	15183	6.127786
6	HAS	11884	4.796326
7	RETURNS	10623	4.287392
8	HAS_FILE	7804	3.149657
9	READS	7683	3.100822
10	AUTHORED	7618	3.074588
11	HAS_COMMIT	7618	3.074588
12	HAS_ACTUAL_TYPE_ARGUMENT	7495	3.024946
13	HAS_PARENT	6162	2.486954
14	OF_GENERIC_TYPE	5346	2.157620
15	SIMILAR	3416	1.378681
16	RETURNS_GENERIC	3250	1.311684
17	WRITES	3065	1.237019
18	CONTAINS	3027	1.221683
19	RESOLVES_TO	2903	1.171637
20	ANNOTATED_BY	2213	0.893156
21	HAS_FIRST_CHILD	1534	0.619115
22	HAS_LAST_CHILD	1534	0.619115
23	HAS_ELEMENT	1522	0.614272
24	REQUIRES	1424	0.574720
25	HAS_UPPER_BOUND	1405	0.567051
26	EXTENDS	1267	0.511355
27	HAS_TEXT	1016	0.410053
28	HAS_SIBLING	1004	0.405210
29	DECLARES_TYPE_PARAMETER	971	0.391891

### 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>



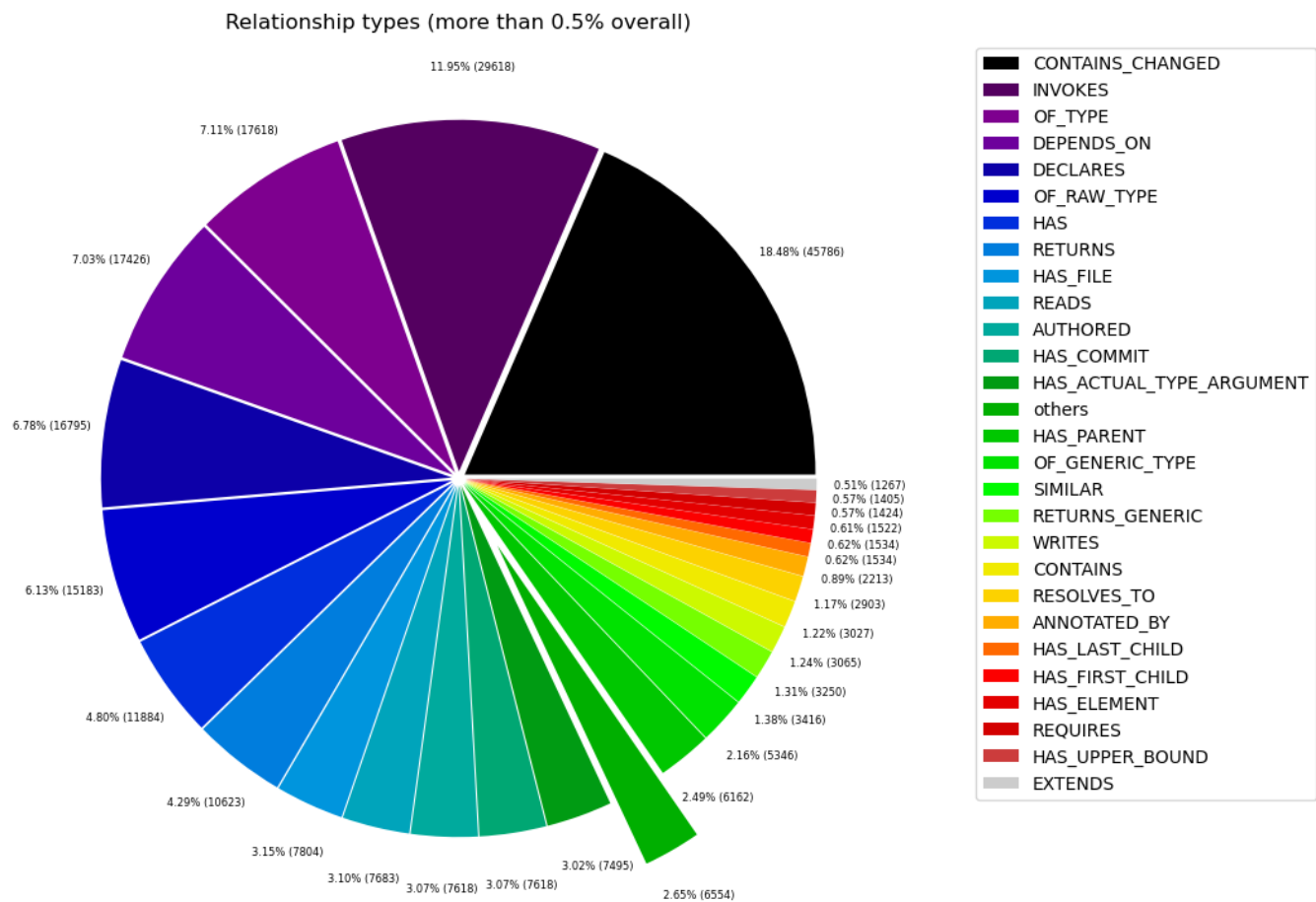


Table 2b - Lowest relationship count by type

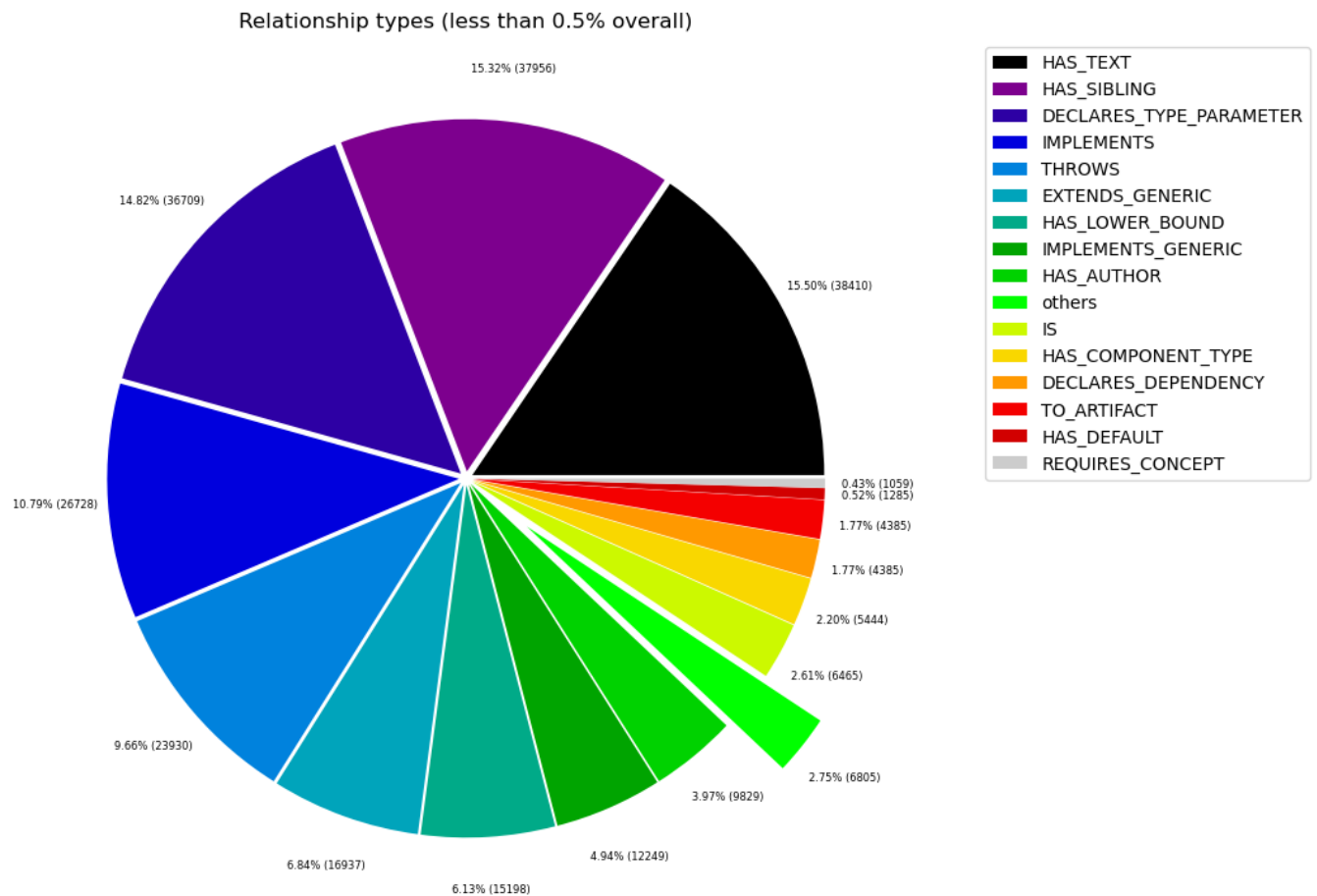
Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	EXCLUDES	1	0.000404
1	THROWS_GENERIC	5	0.002018
2	DESCRIBES	6	0.002422
3	HAS_ROOT_ELEMENT	8	0.003229
4	OF_NAMESPACE	12	0.004843
5	HAS_ATTRIBUTE	12	0.004843
6	HAS_GOAL	14	0.005650
7	HAS_EXECUTION	14	0.005650
8	USES_PLUGIN	16	0.006458
9	IS_ARTIFACT	16	0.006458
10	HAS_CONFIGURATION	16	0.006458
11	REQUIRES_TYPE_PARAMETER	17	0.006861
12	INCLUDES_CONCEPT	19	0.007668
13	DECLARES_NAMESPACE	24	0.009686
14	REQUIRES_CONCEPT	28	0.011301
15	HAS_DEFAULT	34	0.013722
16	TO_ARTIFACT	116	0.046817
17	DECLARES_DEPENDENCY	116	0.046817
18	HAS_COMPONENT_TYPE	144	0.058118
19	IS	171	0.069015
20	HAS_AUTHOR	260	0.104935
21	IMPLEMENTS_GENERIC	324	0.130765
22	HAS_LOWER_BOUND	402	0.162245
23	EXTENDS_GENERIC	448	0.180811
24	THROWS	633	0.255476
25	IMPLEMENTS	707	0.285342
26	DECLARES_TYPE_PARAMETER	971	0.391891
27	HAS_SIBLING	1004	0.405210
28	HAS_TEXT	1016	0.410053

## 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, Log]	CONTAINS_CHANGED	[File, Git, Log]	45786	7618	
1	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	18134	10554	
2	[Repository, Git]	HAS_FILE	[File, Git, Log]	7804	1	
3	[Repository, Git]	HAS_COMMIT	[Git, Commit, Log]	7618	1	
4	[Git, Author, Log]	AUTHORED	[Git, Commit, Log]	7618	260	
5	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	7290	10554	
6	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	6906	10554	
7	[Git, Commit, Log]	HAS_PARENT	[Git, Commit, Log]	6156	7618	
8	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	5720	11184	
9	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3213	6308	
10	[Java, ByteCode, Bound, ParameterizedType]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	2777	6537	
11	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2722	6537	
12	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound, ParameterizedType]	2434	11184	
13	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2228	6537	
14	[Java, ByteCode, Constructor, Method, Member]	WRITES	[Java, ByteCode, Member, Field]	1971	1647	
15	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	1890	10554	
16	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalType, Ext...	1842	2225	
17	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	1818	11184	
18	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	1739	1647	
19	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	1710	1647	
20	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	1694	10554	
21	[Java, ByteCode, Parameter]	ANNOTATED_BY	[Java, Value, ByteCode, Annotation]	1594	11184	
22	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	1535	1647	
23	[Java, ByteCode, Method, Member, Lambda]	INVOKES	[Java, ByteCode, Method, Member]	1532	767	
24	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound]	1527	6537	
25	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	1522	1534	
26	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, Void]	1465	10554	
27	[Java, ByteCode, Method, Member, GenericDeclar...	INVOKES	[Java, ByteCode, Method, Member]	1282	511	
28	[Type, File, Java, ByteCode, JavaType]	DECLARES	[Java, ByteCode, Method, Member]	1277	596	
29	[Java, ByteCode, Constructor, Method, Member]	RETURNS	[Type, File, Java, ByteCode, Void]	1221	1647	

# Graph Density

```
total_number_of_nodes (vertices): 68842
total_number_of_relationships (edges): 247773
-> total directed graph density: 5.228213689317821e-05
-> total directed graph density in percent: 0.0052282136893178205
```