

# 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: 68852

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Java, ByteCode, Parameter]	11184	16.243537
1	[Java, ByteCode, Method, Member]	10648	15.465055
2	[File, Git, Log]	7804	11.334457
3	[Git, Commit, Log]	7618	11.064312
4	[Java, ByteCode, Bound, ParameterizedType]	6537	9.494278
5	[Java, ByteCode, Bound]	6308	9.161680
6	[Java, ByteCode, Member, Field]	2849	4.137861
7	[Java, ByteCode, Bound, WildcardType]	2722	3.953407
8	[Java, Value, ByteCode, Annotation]	2225	3.231569
9	[Java, ByteCode, Constructor, Method, Member]	1651	2.397897
10	[Xml, Element]	1534	2.227967
11	[Xml, Text]	1016	1.475629
12	[Java, ByteCode, Bound, TypeVariable]	988	1.434962
13	[Java, ByteCode, Method, Member, Lambda]	767	1.113984
14	[Type, File, Java, ByteCode, Class]	699	1.015221
15	[Type, File, Java, ByteCode, JavaType]	596	0.865625
16	[Type, File, Java, ByteCode, ResolvedDuplicate...	542	0.787196
17	[Java, ByteCode, Method, Member, GenericDeclar...	525	0.762505
18	[Java, Value, ByteCode, Primitive]	467	0.678266
19	[Git, Author, Log]	260	0.377622
20	[Type, File, Java, ByteCode, Class, GenericDec...	215	0.312264
21	[Type, File, Java, ByteCode, ExternalType]	194	0.281764
22	[Type, File, Java, ByteCode, Interface]	166	0.241097
23	[Java, ByteCode, Bound, GenericArrayType]	144	0.209144
24	[Java, Value, ByteCode, Enum]	142	0.206239
25	[Maven, Dependency]	116	0.168477
26	[Value, Property]	109	0.158311
27	[Package, File, Directory, Java]	107	0.155406
28	[Value, Array]	104	0.151049
29	[Value, ManifestEntry]	91	0.132168

## 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)

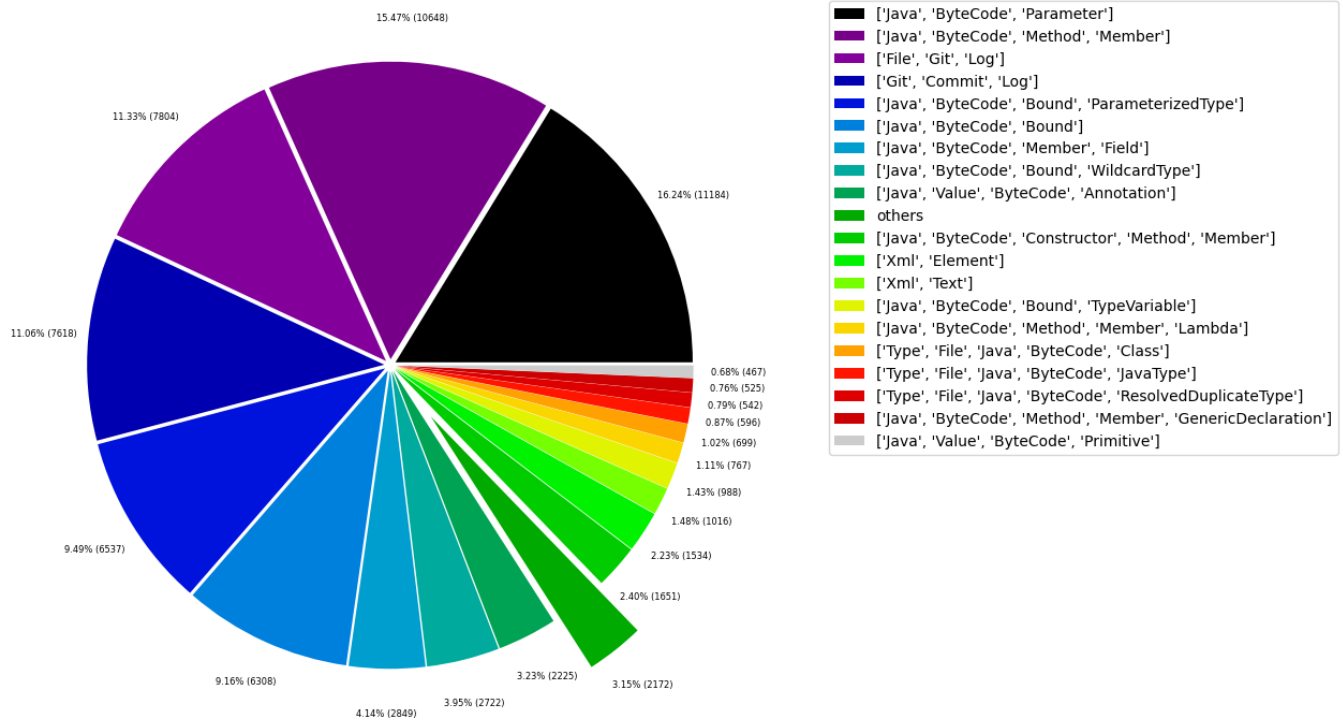


Table 1b - Lowest node count by label combination

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	0.001452
1	[Analyze, Task, jQAssistant]	1	0.001452
2	[Maven, Exclusion]	1	0.001452
3	[Java, ByteCode, Constructor, Method, Member, ...]	3	0.004357
4	[File, Maven, Xml, Pom, Document]	6	0.008714
5	[Type, File, Java, ByteCode, Void]	6	0.008714
6	[Java, ManifestSection]	6	0.008714
7	[File, Java, Manifest]	6	0.008714
8	[Artifact, File, Jar, Archive, Zip, Java]	6	0.008714
9	[File, Java, Properties]	8	0.011619
10	[File, Java, ServiceLoader]	9	0.013072
11	[Xml, Attribute]	12	0.017429
12	[Maven, ExecutionGoal]	14	0.020333
13	[Maven, PluginExecution]	14	0.020333
14	[Maven, Plugin]	16	0.023238
15	[Maven, Configuration]	16	0.023238
16	[jQAssistant, Rule, Concept]	19	0.027595
17	[Type, File, Java, ByteCode, PrimitiveType]	21	0.030500
18	[Xml, Namespace]	24	0.034857
19	[Type, File, Java, ByteCode, Enum]	25	0.036310
20	[Java, Value, ByteCode, Class]	28	0.040667
21	[File, Directory]	29	0.042119
22	[Type, File, Java, ByteCode, Annotation]	40	0.058096
23	[Type, File, Java, ByteCode, ExternalType, Ext...	65	0.094405
24	[Artifact, Maven]	69	0.100215
25	[Type, File, Java, ByteCode, GenericDeclaratio...	79	0.114739
26	[Value, ManifestEntry]	91	0.132168
27	[Value, Array]	104	0.151049
28	[Package, File, Directory, Java]	107	0.155406
29	[Value, Property]	109	0.158311

## 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)

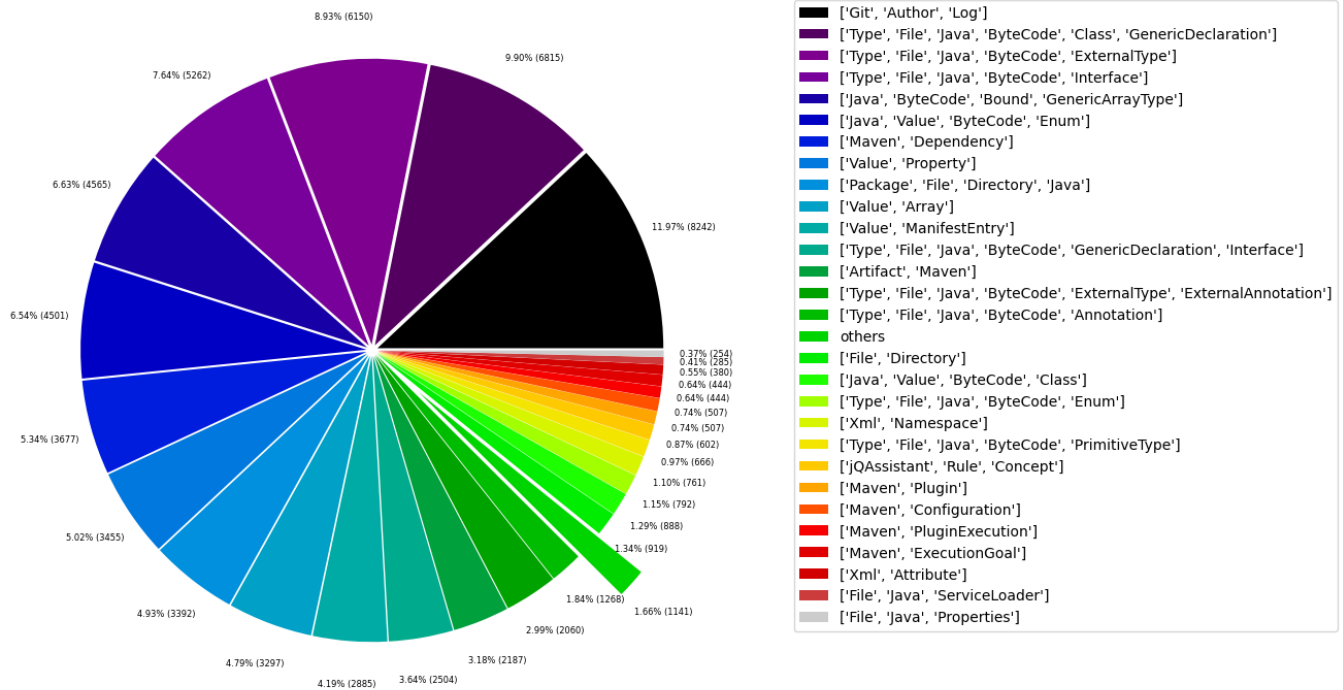


Table 1c - Highest node count by single label

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.

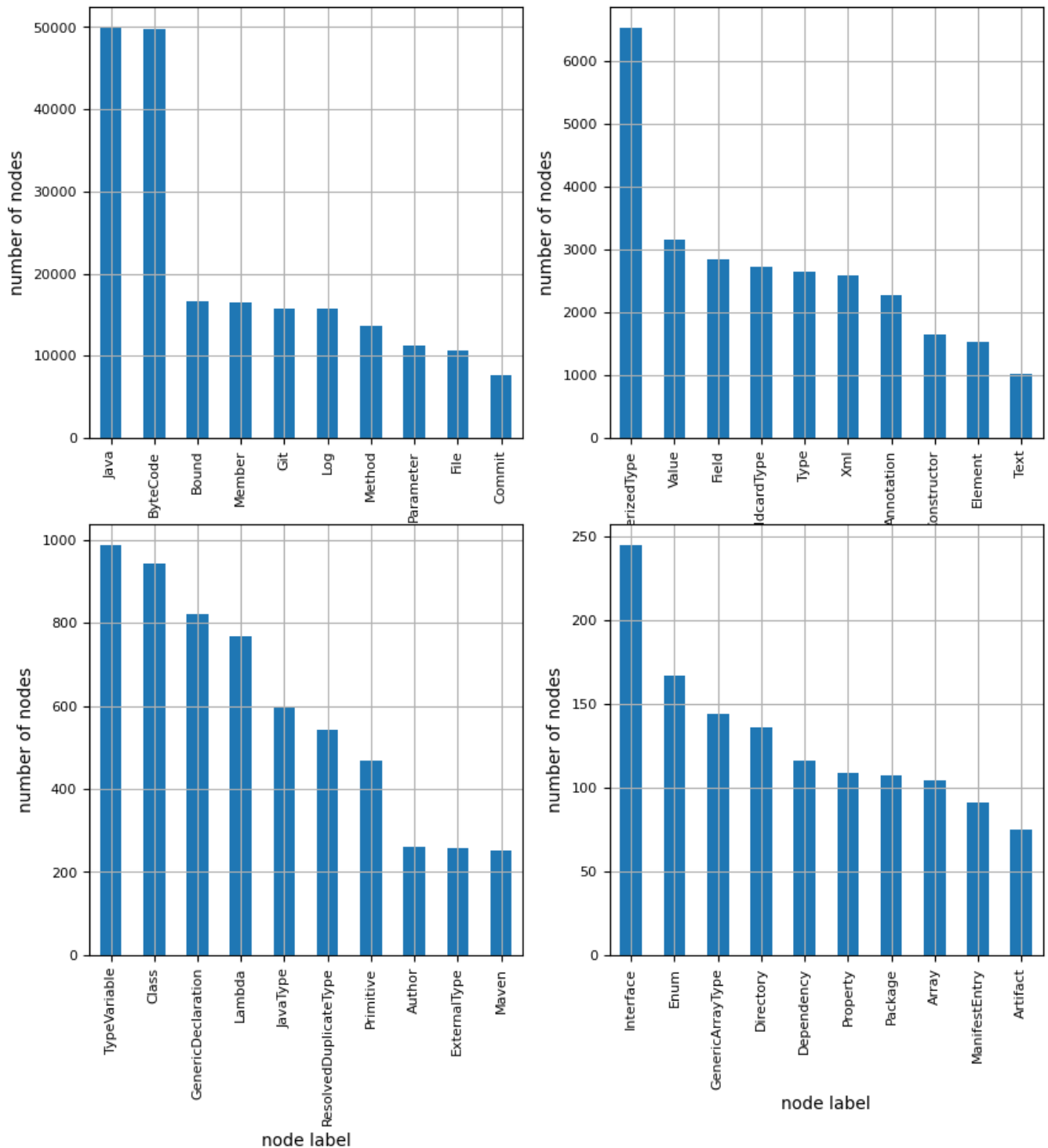
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Java	49978	72.587579
1	ByteCode	49836	72.381340
2	Bound	16699	24.253471
3	Member	16443	23.881659
4	Git	15683	22.777842
5	Log	15682	22.776390
6	Method	13594	19.743798
7	Parameter	11184	16.243537
8	File	10623	15.428746
9	Commit	7618	11.064312
10	ParameterizedType	6537	9.494278
11	Value	3166	4.598269
12	Field	2849	4.137861
13	WildcardType	2722	3.953407
14	Type	2648	3.845930
15	Xml	2592	3.764597
16	Annotation	2265	3.289665
17	Constructor	1654	2.402254
18	Element	1534	2.227967
19	Text	1016	1.475629
20	TypeVariable	988	1.434962
21	Class	942	1.368152
22	GenericDeclaration	822	1.193865
23	Lambda	767	1.113984
24	JavaType	596	0.865625
25	ResolvedDuplicateType	542	0.787196
26	Primitive	467	0.678266
27	Author	260	0.377622
28	ExternalType	259	0.376169
29	Maven	252	0.366002
30	Interface	245	0.355836
31	Enum	167	0.242549
32	GenericArrayType	144	0.209144
33	Directory	136	0.197525
34	Dependency	116	0.168477
35	Property	109	0.158311
36	Package	107	0.155406
37	Array	104	0.151049
38	ManifestEntry	91	0.132168
39	Artifact	75	0.108929

## 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: 247834

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGED	45786	18.474463
1	INVOKES	29656	11.966074
2	OF_TYPE	17618	7.108791
3	DEPENDS_ON	17426	7.031319
4	DECLARES	16805	6.780748
5	OF_RAW_TYPE	15183	6.126278
6	HAS	11884	4.795145
7	RETURNS	10623	4.286337
8	HAS_FILE	7804	3.148882
9	READS	7683	3.100059
10	AUTHORED	7618	3.073832
11	HAS_COMMIT	7618	3.073832
12	HAS_ACTUAL_TYPE_ARGUMENT	7495	3.024202
13	HAS_PARENT	6162	2.486342
14	OF_GENERIC_TYPE	5346	2.157089
15	SIMILAR	3416	1.378342
16	RETURNS_GENERIC	3250	1.311362
17	WRITES	3065	1.236715
18	CONTAINS	3027	1.221382
19	RESOLVES_TO	2916	1.176594
20	ANNOTATED_BY	2213	0.892936
21	HAS_FIRST_CHILD	1534	0.618963
22	HAS_LAST_CHILD	1534	0.618963
23	HAS_ELEMENT	1522	0.614121
24	REQUIRES	1424	0.574578
25	HAS_UPPER_BOUND	1405	0.566912
26	EXTENDS	1267	0.511229
27	HAS_TEXT	1016	0.409952
28	HAS_SIBLING	1004	0.405110
29	DECLARES_TYPE_PARAMETER	971	0.391795

### 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>



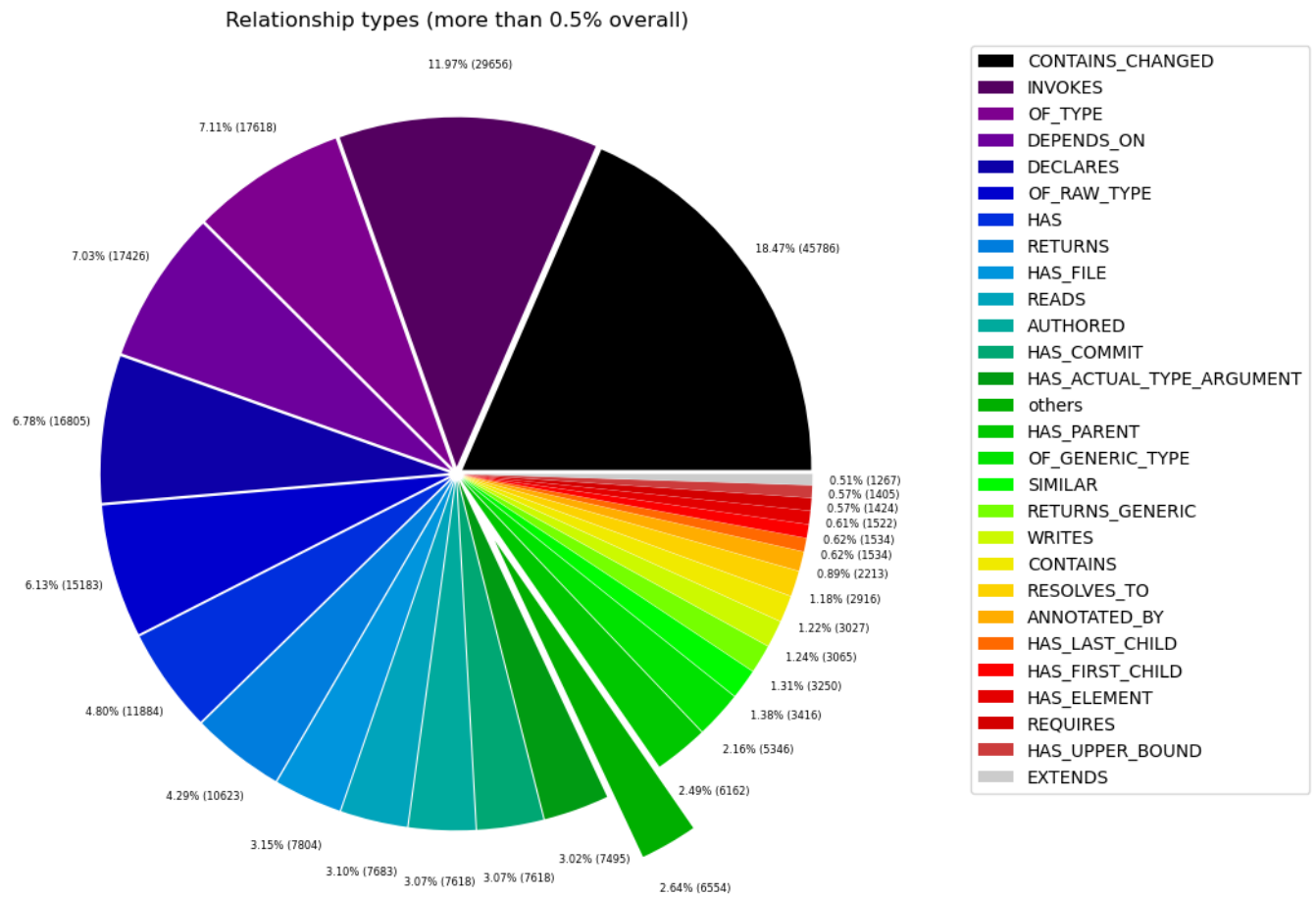


Table 2b - Lowest relationship count by type

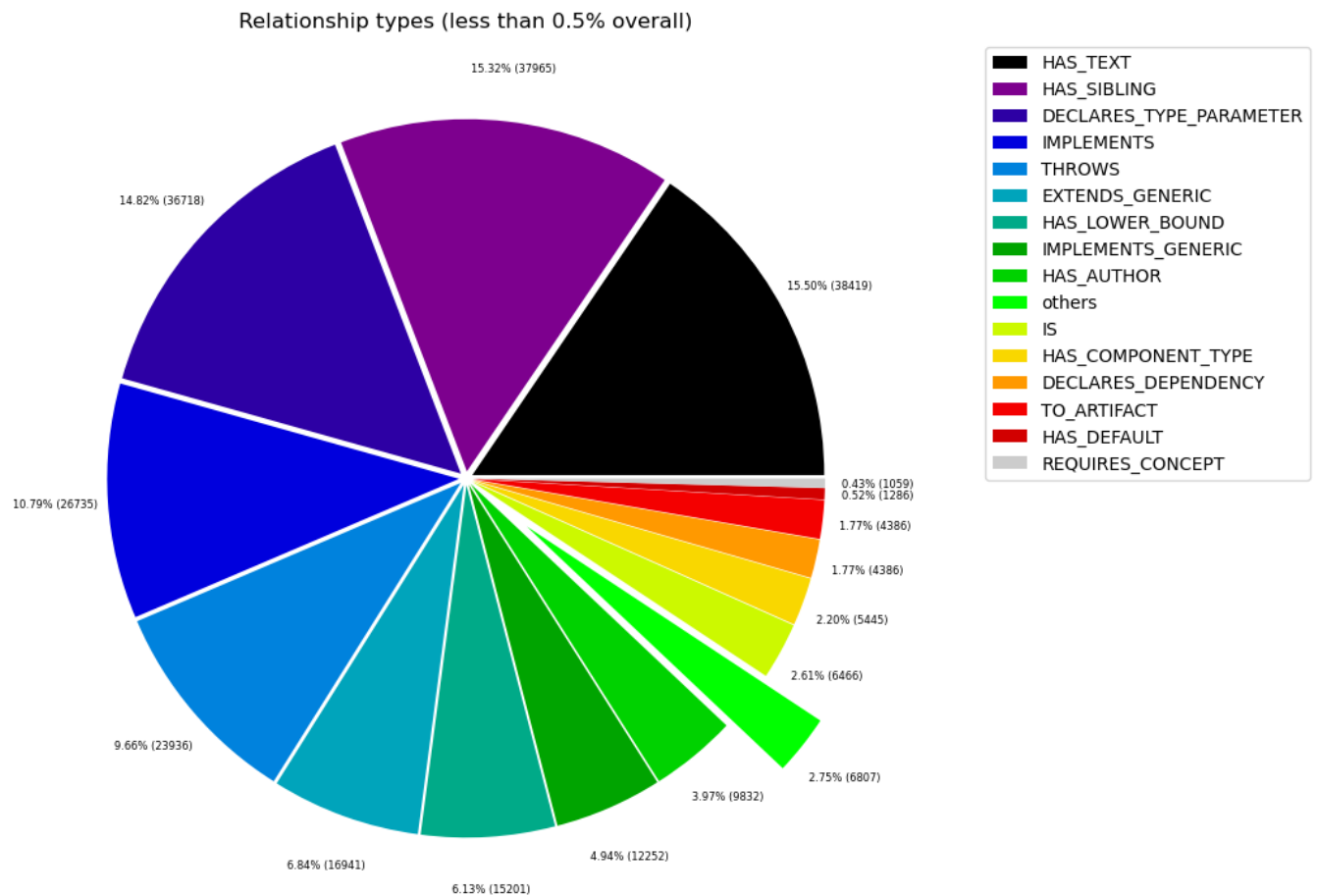
Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	EXCLUDES	1	0.000403
1	THROWS_GENERIC	5	0.002017
2	DESCRIBES	6	0.002421
3	HAS_ROOT_ELEMENT	8	0.003228
4	OF_NAMESPACE	12	0.004842
5	HAS_ATTRIBUTE	12	0.004842
6	HAS_GOAL	14	0.005649
7	HAS_EXECUTION	14	0.005649
8	USES_PLUGIN	16	0.006456
9	IS_ARTIFACT	16	0.006456
10	HAS_CONFIGURATION	16	0.006456
11	REQUIRES_TYPE_PARAMETER	17	0.006859
12	INCLUDES_CONCEPT	19	0.007666
13	DECLARES_NAMESPACE	24	0.009684
14	REQUIRES_CONCEPT	28	0.011298
15	HAS_DEFAULT	34	0.013719
16	TO_ARTIFACT	116	0.046806
17	DECLARES_DEPENDENCY	116	0.046806
18	HAS_COMPONENT_TYPE	144	0.058103
19	IS	171	0.068998
20	HAS_AUTHOR	260	0.104909
21	IMPLEMENTS_GENERIC	324	0.130733
22	HAS_LOWER_BOUND	402	0.162205
23	EXTENDS_GENERIC	448	0.180766
24	THROWS	633	0.255413
25	IMPLEMENTS	707	0.285272
26	DECLARES_TYPE_PARAMETER	971	0.391795
27	HAS_SIBLING	1004	0.405110
28	HAS_TEXT	1016	0.409952

## 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]	18138		10560
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		10560
6	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	6906		10560
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		1651
15	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	1890		10560
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]	1746		1651
19	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	1710		1651
20	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	1707		10560
21	[Java, ByteCode, Parameter]	ANNOTATED_BY	[Java, Value, ByteCode, Annotation]	1594		11184
22	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	1535		1651
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		10560
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		1651

# Graph Density

```
total_number_of_nodes (vertices): 68852
total_number_of_relationships (edges): 247834
-> total directed graph density: 5.2279818830651475e-05
-> total directed graph density in percent: 0.0052279818830651475
```