

# 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: 68849

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Java, ByteCode, Parameter]	11184	16.244245
1	[Java, ByteCode, Method, Member]	10645	15.461372
2	[File, Git, Log]	7804	11.334950
3	[Git, Commit, Log]	7618	11.064794
4	[Java, ByteCode, Bound, ParameterizedType]	6537	9.494691
5	[Java, ByteCode, Bound]	6308	9.162079
6	[Java, ByteCode, Member, Field]	2849	4.138041
7	[Java, ByteCode, Bound, WildcardType]	2722	3.953580
8	[Java, Value, ByteCode, Annotation]	2225	3.231710
9	[Java, ByteCode, Constructor, Method, Member]	1651	2.398001
10	[Xml, Element]	1534	2.228064
11	[Xml, Text]	1016	1.475693
12	[Java, ByteCode, Bound, TypeVariable]	988	1.435024
13	[Java, ByteCode, Method, Member, Lambda]	767	1.114032
14	[Type, File, Java, ByteCode, Class]	699	1.015265
15	[Type, File, Java, ByteCode, JavaType]	596	0.865663
16	[Type, File, Java, ByteCode, ResolvedDuplicate...	542	0.787230
17	[Java, ByteCode, Method, Member, GenericDeclar...	525	0.762538
18	[Java, Value, ByteCode, Primitive]	467	0.678296
19	[Git, Author, Log]	260	0.377638
20	[Type, File, Java, ByteCode, Class, GenericDec...	215	0.312278
21	[Type, File, Java, ByteCode, ExternalType]	194	0.281776
22	[Type, File, Java, ByteCode, Interface]	166	0.241107
23	[Java, ByteCode, Bound, GenericArrayType]	144	0.209153
24	[Java, Value, ByteCode, Enum]	142	0.206248
25	[Maven, Dependency]	116	0.168485
26	[Value, Property]	109	0.158317
27	[Package, File, Directory, Java]	107	0.155413
28	[Value, Array]	104	0.151055
29	[Value, ManifestEntry]	91	0.132173

## 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>

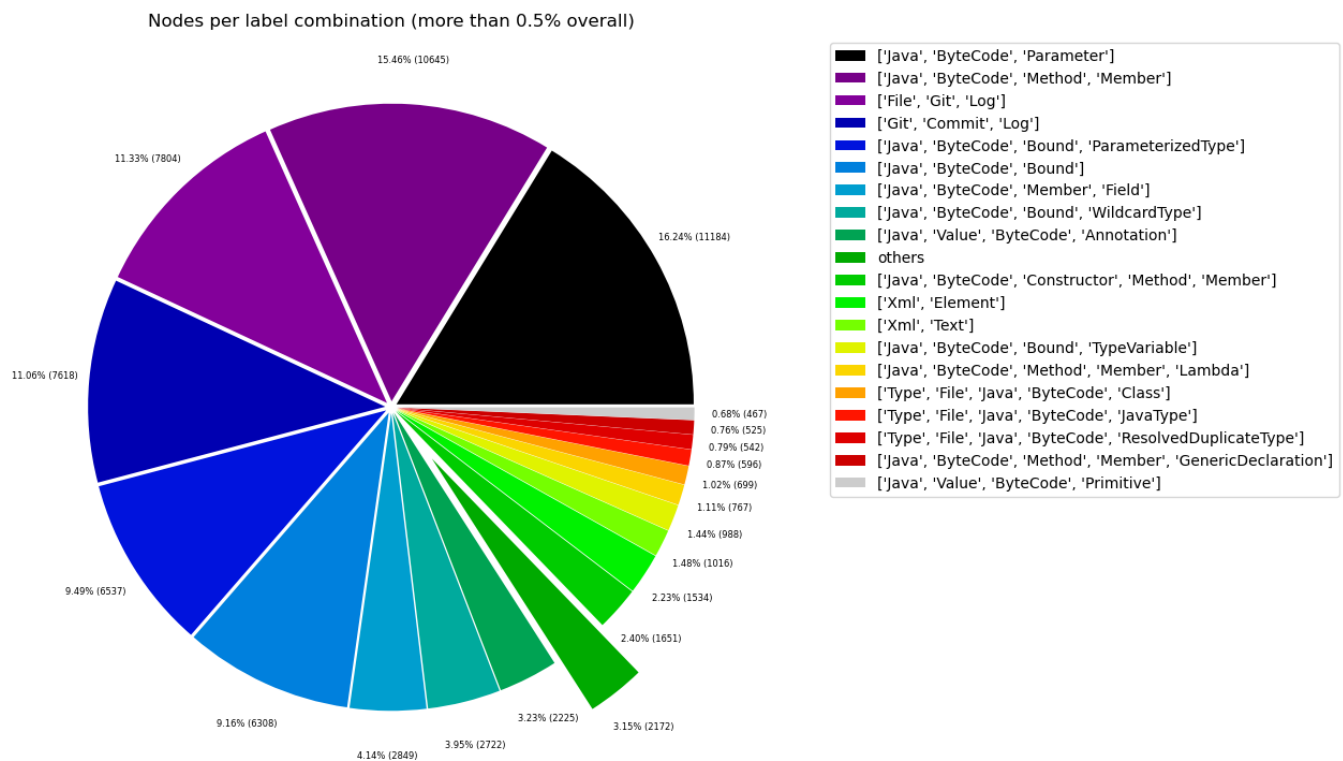


Table 1b - Lowest node count by label combination

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	0.008715
5	[Type, File, Java, ByteCode, Void]	6	0.008715
6	[Java, ManifestSection]	6	0.008715
7	[File, Java, Manifest]	6	0.008715
8	[Artifact, File, Jar, Archive, Zip, Java]	6	0.008715
9	[File, Java, Properties]	8	0.011620
10	[File, Java, ServiceLoader]	9	0.013072
11	[Xml, Attribute]	12	0.017429
12	[Maven, ExecutionGoal]	14	0.020334
13	[Maven, PluginExecution]	14	0.020334
14	[Maven, Plugin]	16	0.023239
15	[Maven, Configuration]	16	0.023239
16	[jQAssistant, Rule, Concept]	19	0.027597
17	[Type, File, Java, ByteCode, PrimitiveType]	21	0.030502
18	[Xml, Namespace]	24	0.034859
19	[Type, File, Java, ByteCode, Enum]	25	0.036311
20	[Java, Value, ByteCode, Class]	28	0.040669
21	[File, Directory]	29	0.042121
22	[Type, File, Java, ByteCode, Annotation]	40	0.058098
23	[Type, File, Java, ByteCode, ExternalType, Ext...	65	0.094410
24	[Artifact, Maven]	69	0.100219
25	[Type, File, Java, ByteCode, GenericDeclaratio...	79	0.114744
26	[Value, ManifestEntry]	91	0.132173
27	[Value, Array]	104	0.151055
28	[Package, File, Directory, Java]	107	0.155413
29	[Value, Property]	109	0.158317

## 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)

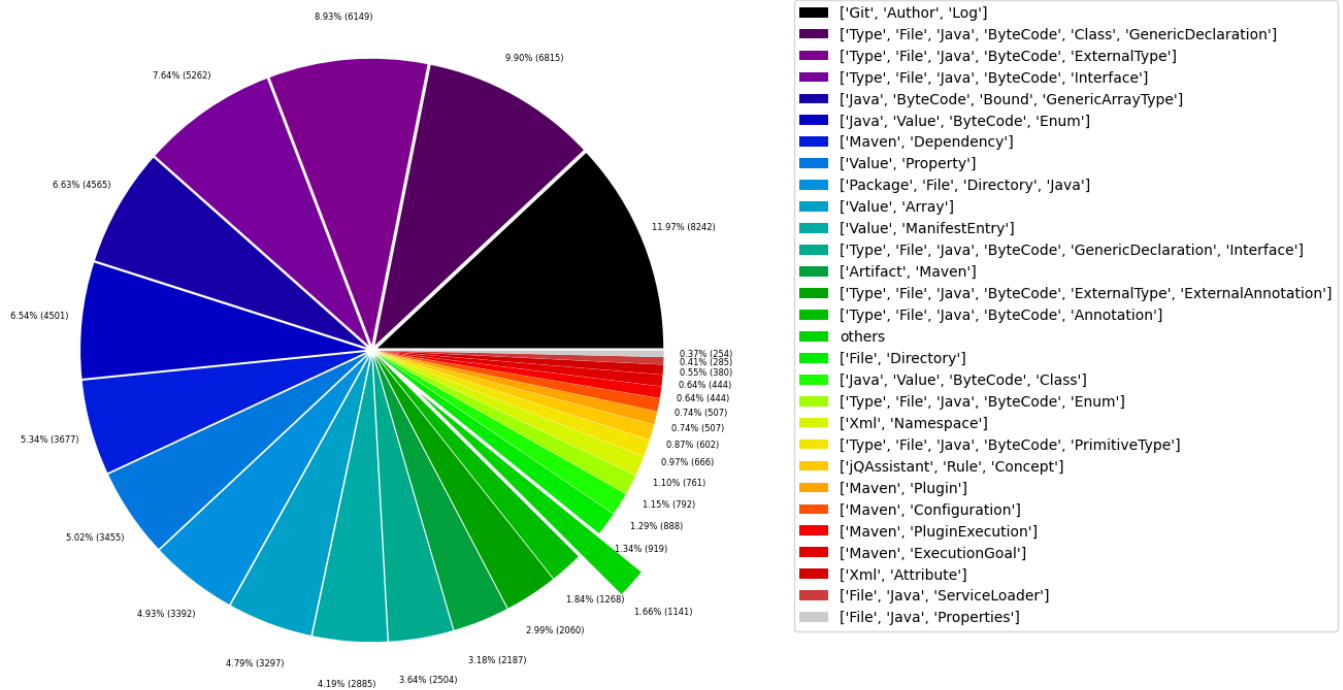


Table 1c - Highest node count by single label

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.

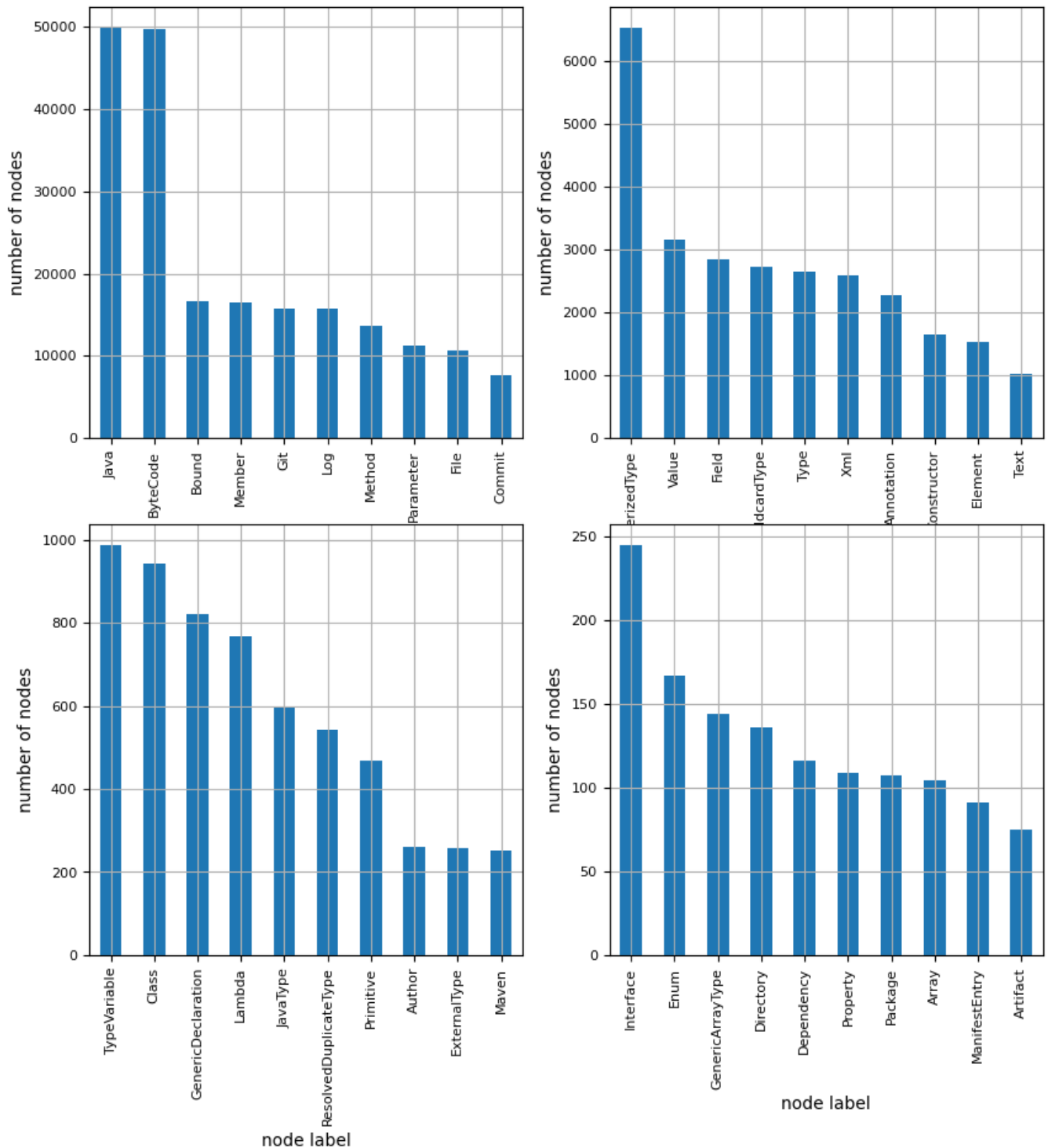
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Java	49975	72.586385
1	ByteCode	49833	72.380136
2	Bound	16699	24.254528
3	Member	16440	23.878342
4	Git	15683	22.778835
5	Log	15682	22.777382
6	Method	13591	19.740301
7	Parameter	11184	16.244245
8	File	10623	15.429418
9	Commit	7618	11.064794
10	ParameterizedType	6537	9.494691
11	Value	3166	4.598469
12	Field	2849	4.138041
13	WildcardType	2722	3.953580
14	Type	2648	3.846098
15	Xml	2592	3.764761
16	Annotation	2265	3.289808
17	Constructor	1654	2.402359
18	Element	1534	2.228064
19	Text	1016	1.475693
20	TypeVariable	988	1.435024
21	Class	942	1.368212
22	GenericDeclaration	822	1.193917
23	Lambda	767	1.114032
24	JavaType	596	0.865663
25	ResolvedDuplicateType	542	0.787230
26	Primitive	467	0.678296
27	Author	260	0.377638
28	ExternalType	259	0.376186
29	Maven	252	0.366018
30	Interface	245	0.355851
31	Enum	167	0.242560
32	GenericArrayType	144	0.209153
33	Directory	136	0.197534
34	Dependency	116	0.168485
35	Property	109	0.158317
36	Package	107	0.155413
37	Array	104	0.151055
38	ManifestEntry	91	0.132173
39	Artifact	75	0.108934

## 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: 247824

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGED	45786	18.475208
1	INVOKES	29652	11.964943
2	OF_TYPE	17618	7.109077
3	DEPENDS_ON	17426	7.031603
4	DECLARES	16802	6.779811
5	OF_RAW_TYPE	15183	6.126525
6	HAS	11884	4.795339
7	RETURNS	10623	4.286510
8	HAS_FILE	7804	3.149009
9	READS	7683	3.100184
10	AUTHORED	7618	3.073956
11	HAS_COMMIT	7618	3.073956
12	HAS_ACTUAL_TYPE_ARGUMENT	7495	3.024324
13	HAS_PARENT	6162	2.486442
14	OF_GENERIC_TYPE	5346	2.157176
15	SIMILAR	3416	1.378398
16	RETURNS_GENERIC	3250	1.311415
17	WRITES	3065	1.236765
18	CONTAINS	3027	1.221431
19	RESOLVES_TO	2913	1.175431
20	ANNOTATED_BY	2213	0.892972
21	HAS_FIRST_CHILD	1534	0.618988
22	HAS_LAST_CHILD	1534	0.618988
23	HAS_ELEMENT	1522	0.614146
24	REQUIRES	1424	0.574601
25	HAS_UPPER_BOUND	1405	0.566935
26	EXTENDS	1267	0.511250
27	HAS_TEXT	1016	0.409968
28	HAS_SIBLING	1004	0.405126
29	DECLARES_TYPE_PARAMETER	971	0.391810

### 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>



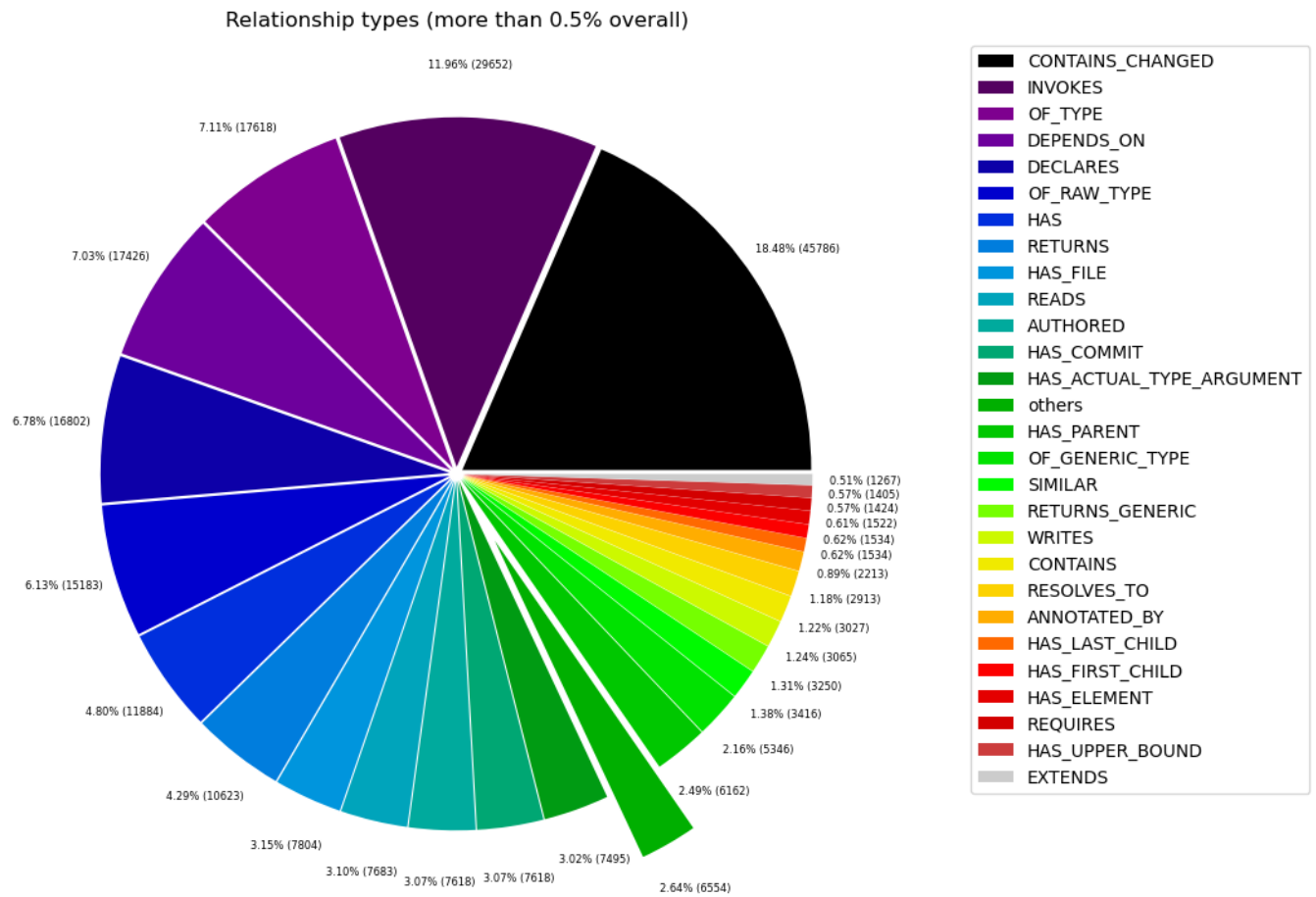


Table 2b - Lowest relationship count by type

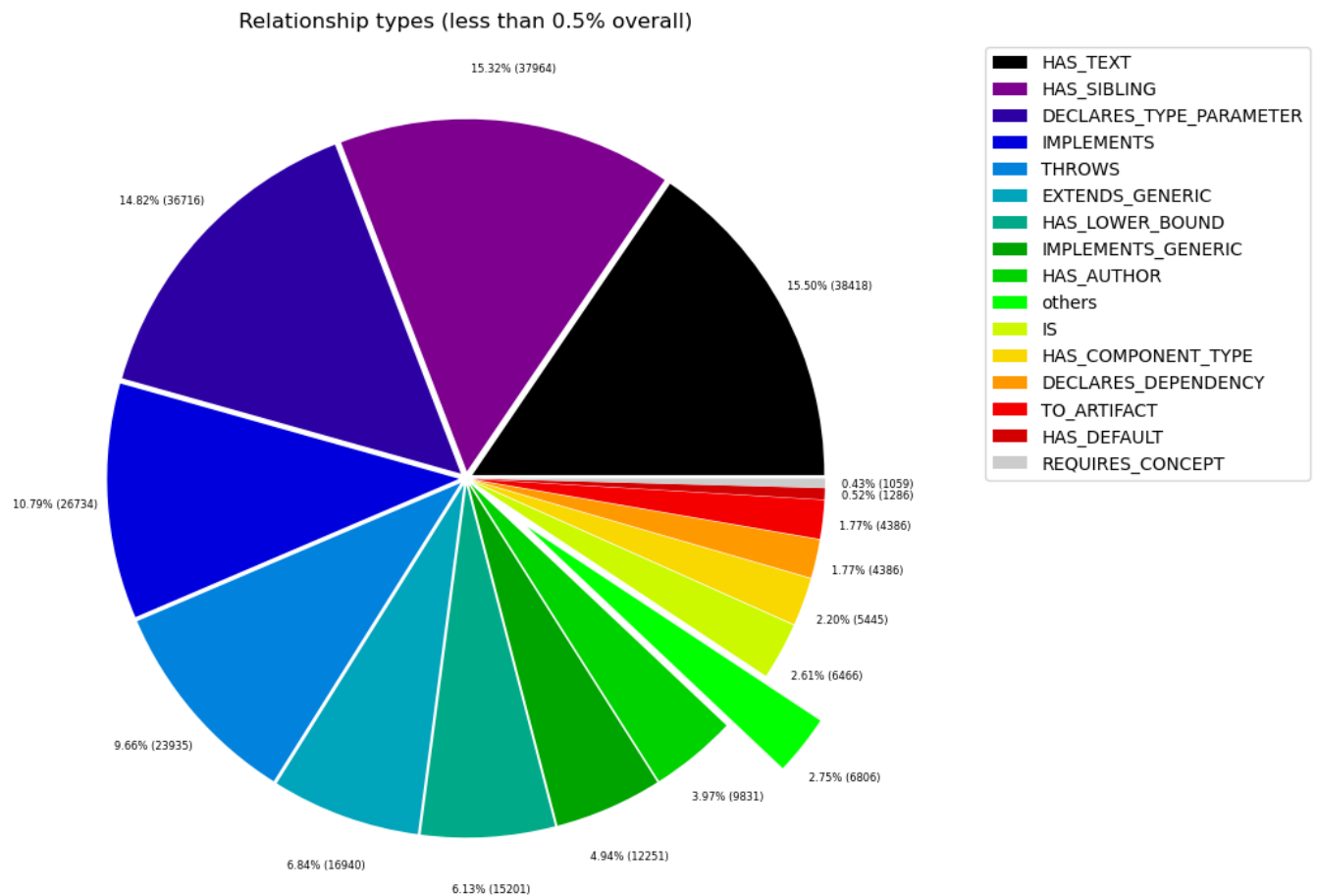
Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	EXCLUDES	1	0.000404
1	THROWS_GENERIC	5	0.002018
2	DESCRIBES	6	0.002421
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	0.006860
12	INCLUDES_CONCEPT	19	0.007667
13	DECLARES_NAMESPACE	24	0.009684
14	REQUIRES_CONCEPT	28	0.011298
15	HAS_DEFAULT	34	0.013719
16	TO_ARTIFACT	116	0.046807
17	DECLARES_DEPENDENCY	116	0.046807
18	HAS_COMPONENT_TYPE	144	0.058106
19	IS	171	0.069001
20	HAS_AUTHOR	260	0.104913
21	IMPLEMENTS_GENERIC	324	0.130738
22	HAS_LOWER_BOUND	402	0.162212
23	EXTENDS_GENERIC	448	0.180773
24	THROWS	633	0.255423
25	IMPLEMENTS	707	0.285283
26	DECLARES_TYPE_PARAMETER	971	0.391810
27	HAS_SIBLING	1004	0.405126
28	HAS_TEXT	1016	0.409968

## 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	10557	
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	10557	
6	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	6906	10557	
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	10557	
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	10557	
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	10557	
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): 68849

total\_number\_of\_relationships (edges): 247824

-> total directed graph density: 5.2282265351638806e-05

-> total directed graph density in percent: 0.005228226535163881