

# 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: 319383

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	231375	72.444369
1	[Java, ByteCode, Method, Member]	13187	4.128899
2	[Java, ByteCode, Parameter]	12968	4.060329
3	[Git, Commit]	11686	3.658930
4	[File, Git]	10578	3.312011
5	[Java, ByteCode, Bound, ParameterizedType]	7154	2.239944
6	[Java, ByteCode, Bound]	7094	2.221158
7	[Java, ByteCode, Member, Field]	3483	1.090540
8	[Java, ByteCode, Bound, WildcardType]	2902	0.908627
9	[Java, Value, ByteCode, Annotation]	2813	0.880761
10	[Xml, Element]	2144	0.671294
11	[Java, ByteCode, Constructor, Method, Member]	2036	0.637479
12	[Xml, Text]	1436	0.449617
13	[Java, ByteCode, Bound, TypeVariable]	1094	0.342535
14	[Java, ByteCode, Method, Member, Lambda]	931	0.291500
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	899	0.281480
16	[Type, File, Java, ByteCode, Class]	858	0.268643
17	[Type, File, Java, ByteCode, JavaType]	746	0.233575
18	[Java, Value, ByteCode, Primitive]	647	0.202578
19	[Java, ByteCode, Method, Member, GenericDeclar...	567	0.177530
20	[Json, Key]	555	0.173773
21	[Value, Json, Scalar]	539	0.168763
22	[Type, File, Java, ByteCode, ExternalType]	396	0.123989
23	[Author, Git, Person]	289	0.090487
24	[Value, Array]	267	0.083599
25	[Committer, Git, Person]	243	0.076084
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.073892
27	[Value, Property]	202	0.063247
28	[Type, File, Java, ByteCode, Interface]	186	0.058237
29	[Java, Value, ByteCode, Class]	170	0.053228

## 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)

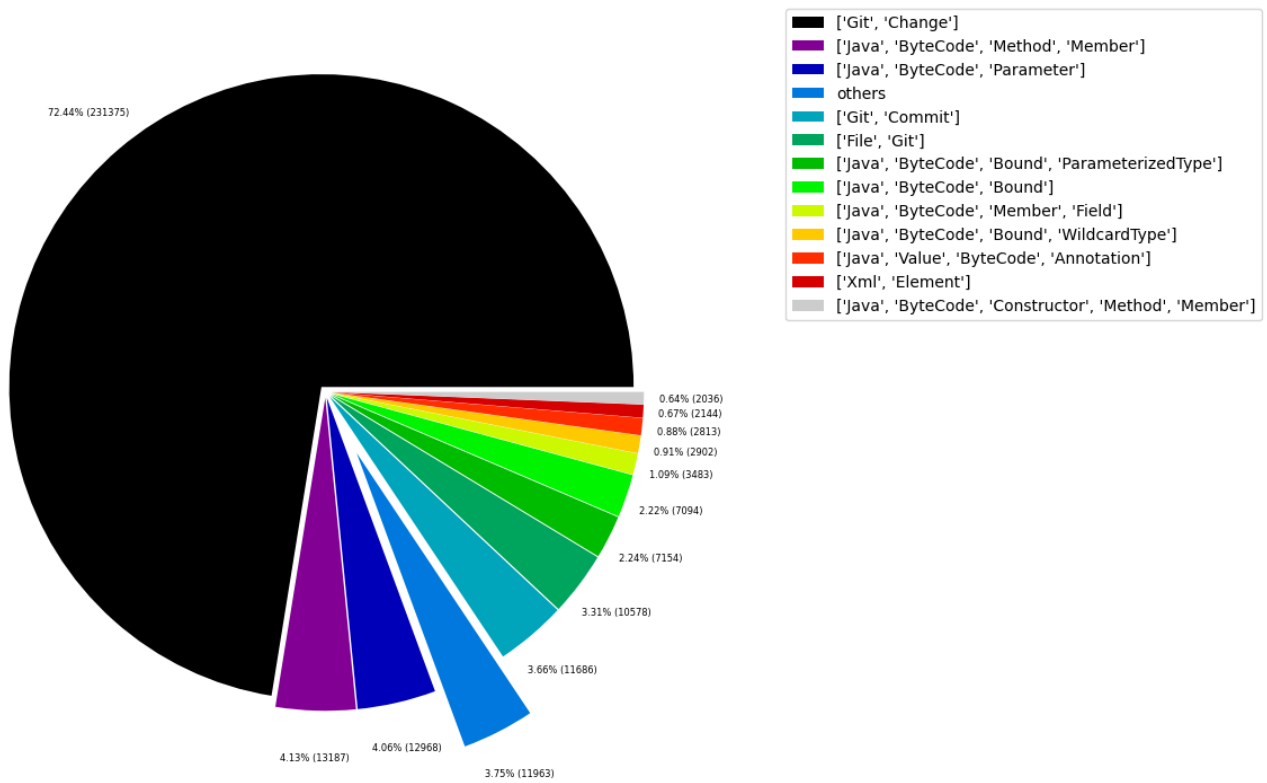


Table 1b - Lowest node count by label combination

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	0.000626
3	[File]	3	0.000939
4	[Java, ByteCode, Constructor, Method, Member, ...]	4	0.001252
5	[Maven, Exclusion]	5	0.001566
6	[Value, Array, Json]	6	0.001879
7	[File, Maven, Xml, Pom, Document]	9	0.002818
8	[Type, File, Java, ByteCode, Void]	9	0.002818
9	[Java, ManifestSection]	9	0.002818
10	[File, Java, Manifest]	9	0.002818
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002818
12	[File, Java, ServiceLoader]	10	0.003131
13	[File, Java, Properties]	12	0.003757
14	[Maven, ExecutionGoal]	16	0.005010
15	[Maven, PluginExecution]	16	0.005010
16	[Xml, Attribute]	18	0.005636
17	[jQAssistant, Rule, Concept]	19	0.005949
18	[Maven, Plugin]	21	0.006575
19	[Maven, Configuration]	21	0.006575
20	[Git, Branch]	25	0.007828
21	[Type, File, Java, ByteCode, Enum]	28	0.008767
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.009080
23	[Xml, Namespace]	36	0.011272
24	[Type, File, Java, ByteCode, Annotation]	43	0.013463
25	[File, Directory]	44	0.013777
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.026614
27	[Artifact, Maven]	92	0.028806
28	[Type, File, Java, ByteCode, ExternalType, Ext...	93	0.029119
29	[Value, ManifestEntry]	120	0.037572

## 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)

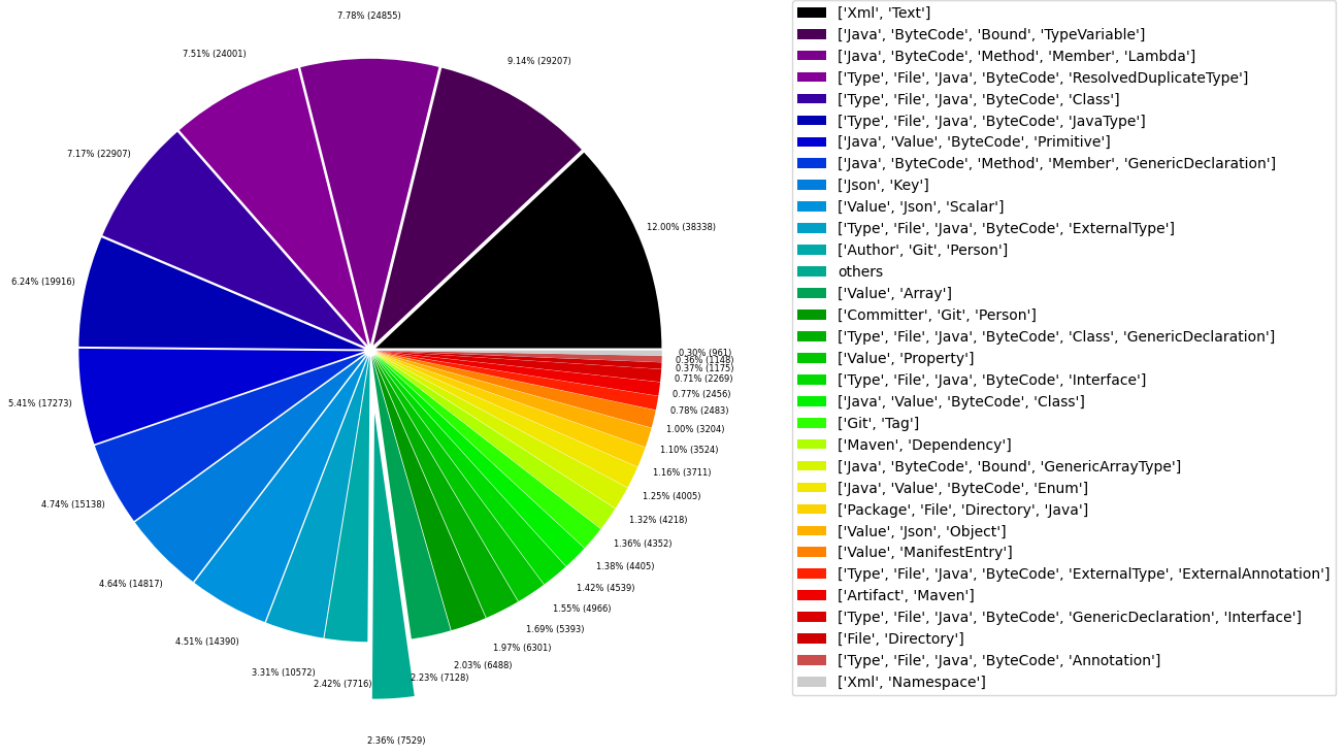


Table 1c - Highest node count by single label

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.

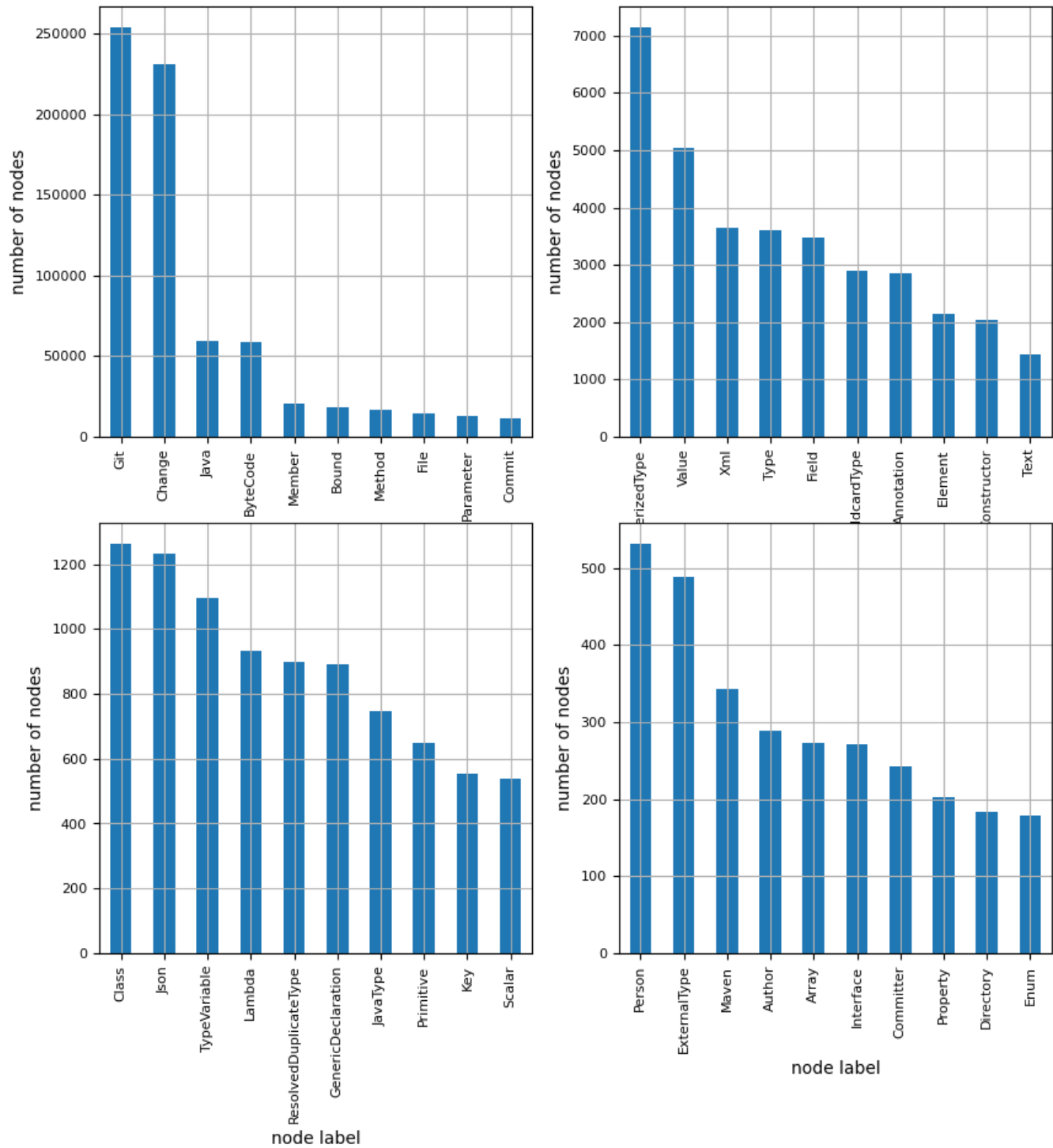
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	254361	79.641371
1	Change	231375	72.444369
2	Java	59154	18.521336
3	ByteCode	58966	18.462473
4	Member	20208	6.327200
5	Bound	18402	5.761734
6	Method	16725	5.236659
7	File	14424	4.516208
8	Parameter	12968	4.060329
9	Commit	11686	3.658930
10	ParameterizedType	7154	2.239944
11	Value	5046	1.579921
12	Xml	3643	1.140637
13	Type	3608	1.129678
14	Field	3483	1.090540
15	WildcardType	2902	0.908627
16	Annotation	2856	0.894224
17	Element	2144	0.671294
18	Constructor	2040	0.638732
19	Text	1436	0.449617
20	Class	1264	0.395763
21	Json	1234	0.386370
22	TypeVariable	1094	0.342535
23	Lambda	931	0.291500
24	ResolvedDuplicateType	899	0.281480
25	GenericDeclaration	892	0.279289
26	JavaType	746	0.233575
27	Primitive	647	0.202578
28	Key	555	0.173773
29	Scalar	539	0.168763
30	Person	532	0.166571
31	ExternalType	489	0.153108
32	Maven	343	0.107395
33	Author	289	0.090487
34	Array	273	0.085477
35	Interface	271	0.084851
36	Committer	243	0.076084
37	Property	202	0.063247
38	Directory	183	0.057298
39	Enum	178	0.055732

## 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: 968041

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	231375	23.901364
1	MODIFIES	231375	23.901364
2	UPDATES	148248	15.314227
3	CREATES	57638	5.954087
4	INVOKES	35759	3.693955
5	DELETES	35351	3.651808
6	COMMITTED	23372	2.414361
7	DEPENDS_ON	21459	2.216745
8	OF_TYPE	21292	2.199494
9	DECLARES	20647	2.132864
10	OF_RAW_TYPE	17041	1.760359
11	HAS_PARENT	14206	1.467500
12	HAS	14057	1.452108
13	RETURNS	12524	1.293747
14	RENAMES	9862	1.018759
15	READS	9068	0.936737
16	HAS_ACTUAL_TYPE_ARGUMENT	8261	0.853373
17	HAS_NEW_NAME	6163	0.636647
18	OF_GENERIC_TYPE	5892	0.608652
19	RESOLVES_TO	5241	0.541403
20	SIMILAR	3915	0.404425
21	CONTAINS	3797	0.392235
22	WRITES	3796	0.392132
23	RETURNS_GENERIC	3538	0.365480
24	ANNOTATED_BY	2801	0.289347
25	REQUIRES	2172	0.224371
26	HAS_FIRST_CHILD	2144	0.221478
27	HAS_LAST_CHILD	2144	0.221478
28	HAS_ELEMENT	2126	0.219619
29	HAS_UPPER_BOUND	1519	0.156915

## 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)

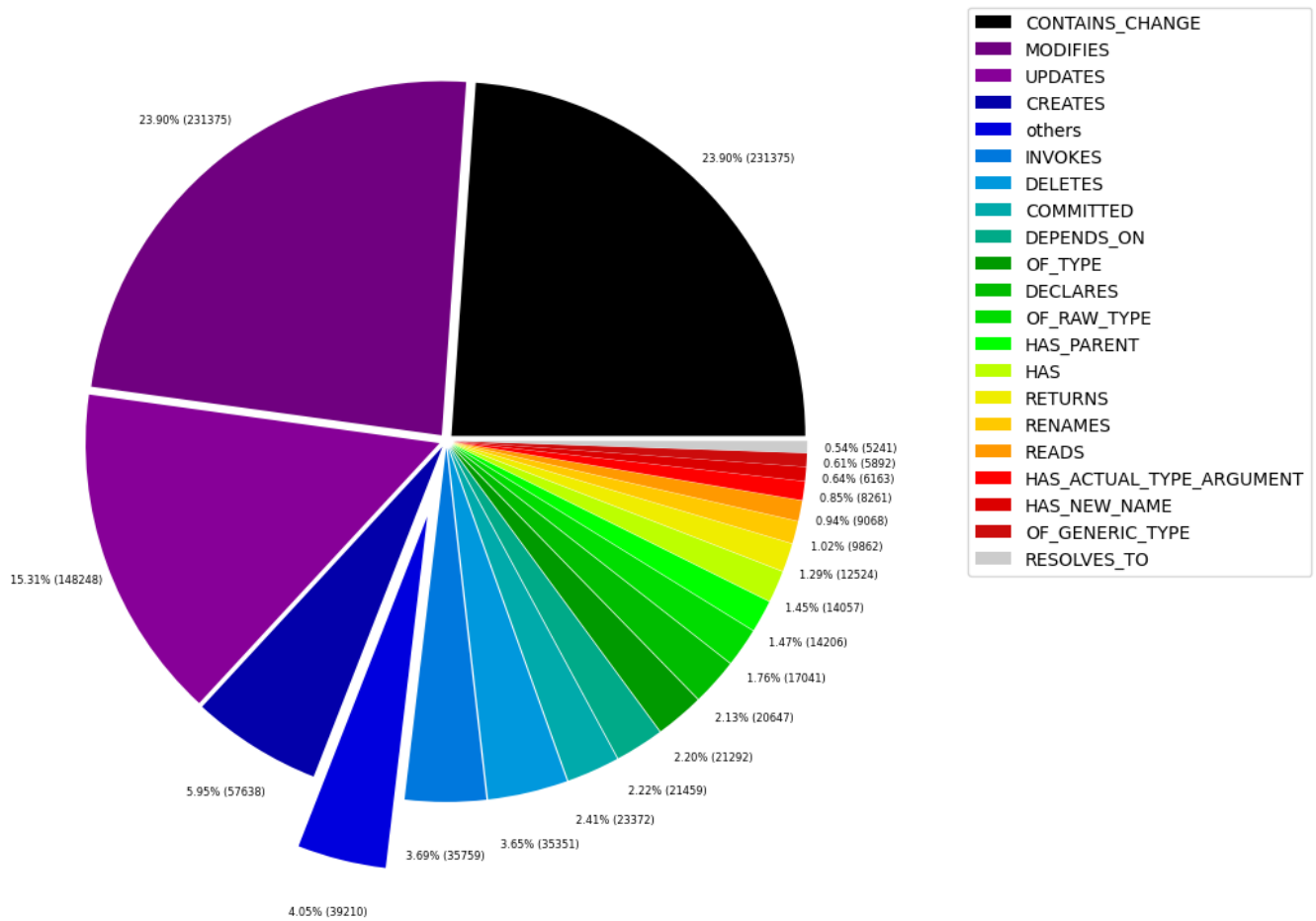


Table 2b - Lowest relationship count by type

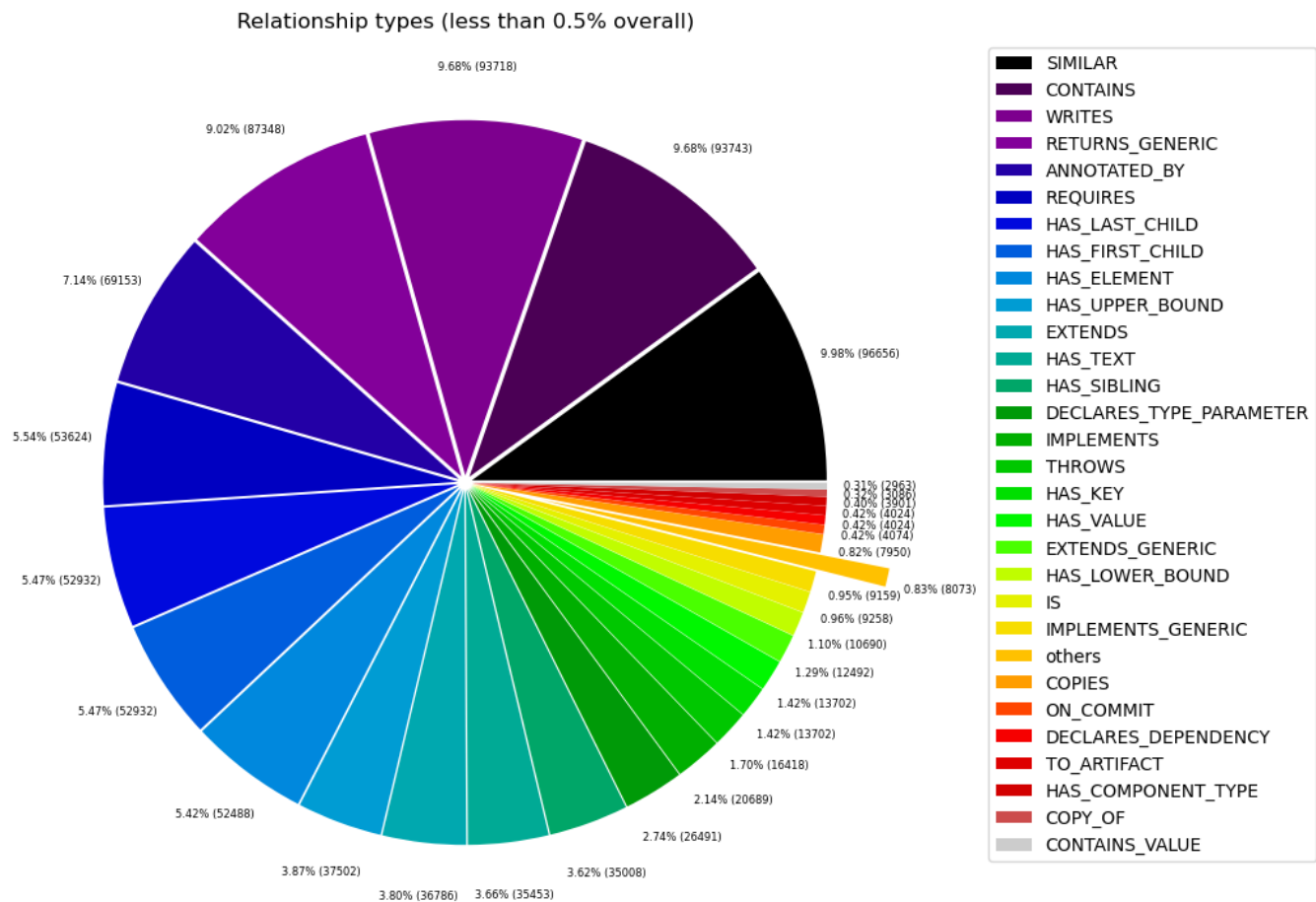
Lists the 30 relationships type with the lowest number of occurrences up to 0.5% of the total node count. This is essentially breaking down the "others" slice from the chart above.

	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	0.001136
5	HAS_GOAL	16	0.001653
6	HAS_EXECUTION	16	0.001653
7	OF_NAMESPACE	18	0.001859
8	HAS_ATTRIBUTE	18	0.001859
9	INCLUDES_CONCEPT	19	0.001963
10	USES_PLUGIN	21	0.002169
11	REQUIRES_TYPE_PARAMETER	21	0.002169
12	IS_ARTIFACT	21	0.002169
13	HAS_CONFIGURATION	21	0.002169
14	HAS_HEAD	25	0.002583
15	REQUIRES_CONCEPT	28	0.002892
16	DECLARES_NAMESPACE	36	0.003719
17	HAS_DEFAULT	36	0.003719
18	CONTAINS_VALUE	120	0.012396
19	COPY_OF	125	0.012913
20	HAS_COMPONENT_TYPE	158	0.016322
21	TO_ARTIFACT	163	0.016838
22	DECLARES_DEPENDENCY	163	0.016838
23	ON_COMMIT	165	0.017045
24	COPIES	322	0.033263
25	IMPLEMENTS_GENERIC	371	0.038325
26	IS	375	0.038738
27	HAS_LOWER_BOUND	433	0.044730
28	EXTENDS_GENERIC	506	0.052271
29	HAS_VALUE	555	0.057332

## 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]	231375	11686	
1	[Git, Change]	MODIFIES	[File, Git]	231375	231375	
2	[Git, Change]	UPDATES	[File, Git]	148248	231375	
3	[Git, Change]	CREATES	[File, Git]	57638	231375	
4	[Git, Change]	DELETES	[File, Git]	35351	231375	
5	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	21885	13071	
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14197	11686	
7	[Author, Git, Person]	COMMITTED	[Git, Commit]	11686	289	
8	[Committer, Git, Person]	COMMITTED	[Git, Commit]	11686	243	
9	[Git, Change]	RENAMES	[File, Git]	9862	231375	
10	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	8290	13071	
11	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	8125	13071	
12	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6335	12968	
13	[File, Git]	HAS_NEW_NAME	[File, Git]	6163	10578	
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	2036	
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]	2106	2036	
23	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2088	13071	
24	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2034	13071	
25	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	2021	2036	
26	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2020	12968	
27	[Java, ByteCode, Method, Member, Lambda]	INVOKES	[Java, ByteCode, Method, Member]	1866	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]	1790	2036	

## Graph Density

```
total_number_of_nodes (vertices): 319383
total_number_of_relationships (edges): 968041
-> total directed graph density: 9.49011596867834e-06
-> total directed graph density in percent: 0.0009490115968678341
```