

# 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`.

	nodeLabels	nodesWithThatLabels	nodesWithThatLabelsPercent
0	[Git, Change]	245572	73.488027
1	[Java, ByteCode, Method, Member]	13202	3.950731
2	[Java, ByteCode, Parameter]	13000	3.890282
3	[Git, Commit]	12038	3.602401
4	[File, Git]	10675	3.194520
5	[Java, ByteCode, Bound, ParameterizedType]	7166	2.144443
6	[Java, ByteCode, Bound]	7112	2.128284
7	[Java, ByteCode, Member, Field]	3494	1.045588
8	[Java, ByteCode, Bound, WildcardType]	2906	0.869628
9	[Java, Value, ByteCode, Annotation]	2821	0.844191
10	[Xml, Element]	2144	0.641597
11	[Java, ByteCode, Constructor, Method, Member]	2040	0.610475
12	[Xml, Text]	1436	0.429727
13	[Java, ByteCode, Bound, TypeVariable]	1096	0.327981
14	[Java, ByteCode, Method, Member, Lambda]	936	0.280100
15	[Type, File, Java, ByteCode, ResolvedDuplicate...	900	0.269327
16	[Type, File, Java, ByteCode, Class]	861	0.257656
17	[Type, File, Java, ByteCode, JavaType]	746	0.223242
18	[Java, Value, ByteCode, Primitive]	650	0.194514
19	[Java, ByteCode, Method, Member, GenericDeclar...	569	0.170275
20	[Json, Key]	555	0.166085
21	[Value, Json, Scalar]	539	0.161297
22	[Type, File, Java, ByteCode, ExternalType]	396	0.118504
23	[Author, Git, Person]	293	0.087681
24	[Value, Array]	267	0.079900
25	[Committer, Git, Person]	248	0.074215
26	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.070624
27	[Value, Property]	202	0.060449
28	[Type, File, Java, ByteCode, Interface]	187	0.055960
29	[Java, Value, ByteCode, Class]	172	0.051471

## 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)

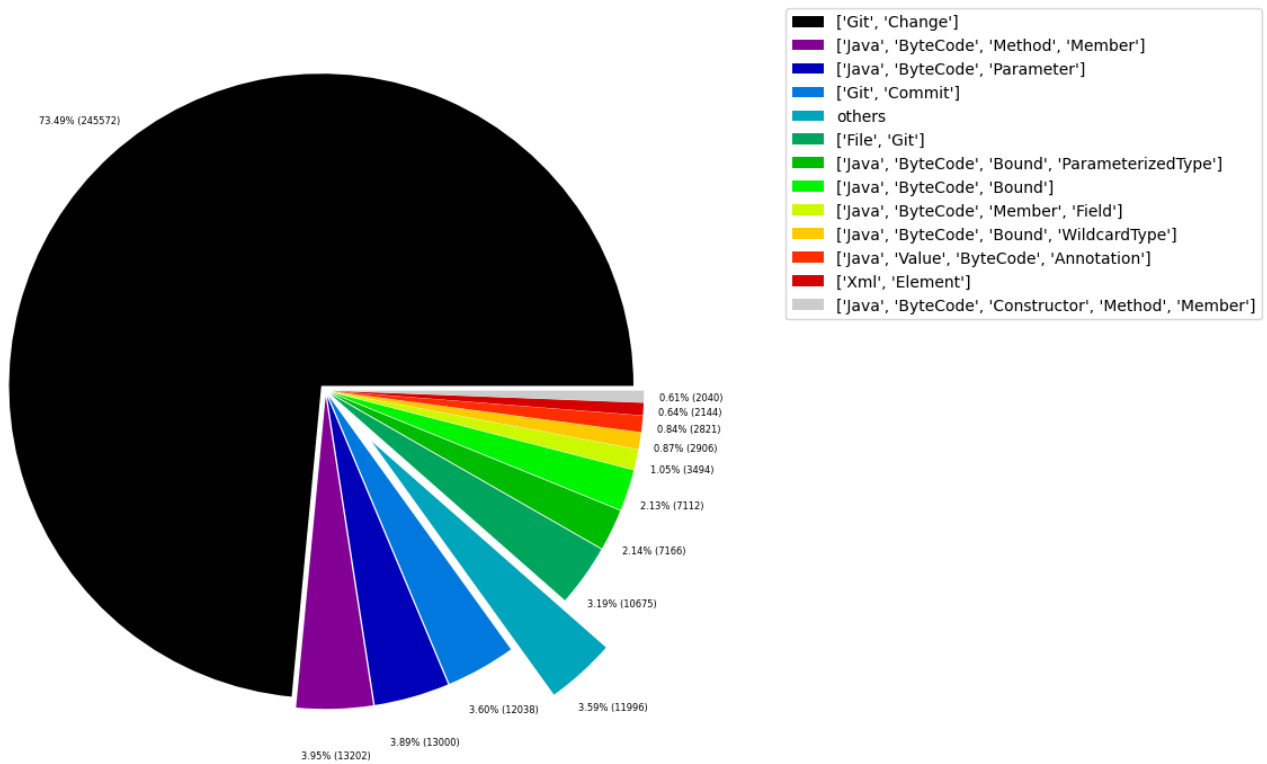


Table 1b - Lowest node count by label combination

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	0.000299
1	[Repository, File, Git]	1	0.000299
2	[File, Json]	2	0.000599
3	[File]	3	0.000898
4	[Java, ByteCode, Constructor, Method, Member, ...]	4	0.001197
5	[Maven, Exclusion]	5	0.001496
6	[Value, Array, Json]	6	0.001796
7	[File, Maven, Xml, Pom, Document]	9	0.002693
8	[Type, File, Java, ByteCode, Void]	9	0.002693
9	[Java, ManifestSection]	9	0.002693
10	[File, Java, Manifest]	9	0.002693
11	[Artifact, File, Jar, Archive, Zip, Java]	9	0.002693
12	[File, Java, ServiceLoader]	10	0.002993
13	[File, Java, Properties]	12	0.003591
14	[Maven, ExecutionGoal]	16	0.004788
15	[Maven, PluginExecution]	16	0.004788
16	[Xml, Attribute]	18	0.005387
17	[jQAssistant, Rule, Concept]	19	0.005686
18	[Maven, Plugin]	21	0.006284
19	[Maven, Configuration]	21	0.006284
20	[Git, Branch]	27	0.008080
21	[Type, File, Java, ByteCode, Enum]	28	0.008379
22	[Type, File, Java, ByteCode, PrimitiveType]	29	0.008678
23	[Xml, Namespace]	36	0.010773
24	[Type, File, Java, ByteCode, Annotation]	43	0.012868
25	[File, Directory]	44	0.013167
26	[Type, File, Java, ByteCode, GenericDeclaratio...	85	0.025436
27	[Artifact, Maven]	92	0.027531
28	[Type, File, Java, ByteCode, ExternalType, Ext...	93	0.027830
29	[Value, ManifestEntry]	120	0.035910

## 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)

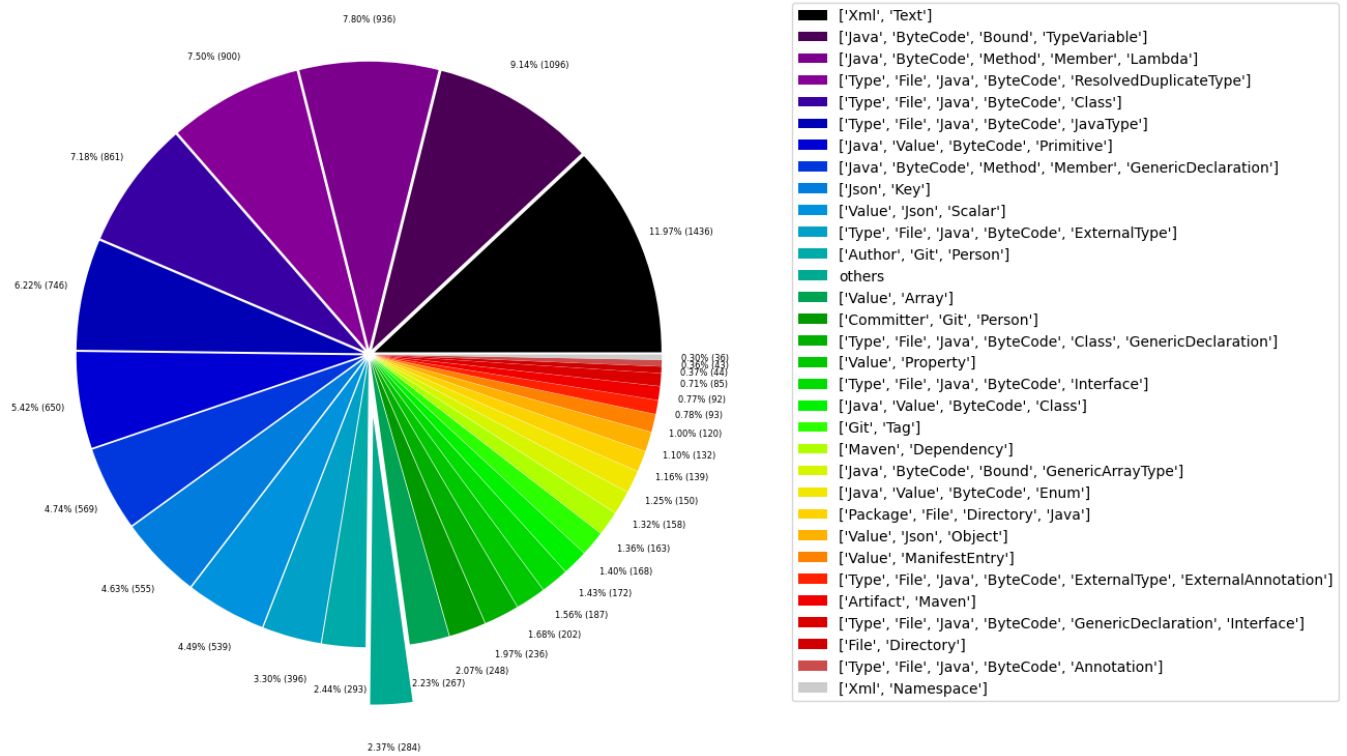


Table 1c - Highest node count by single label

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.

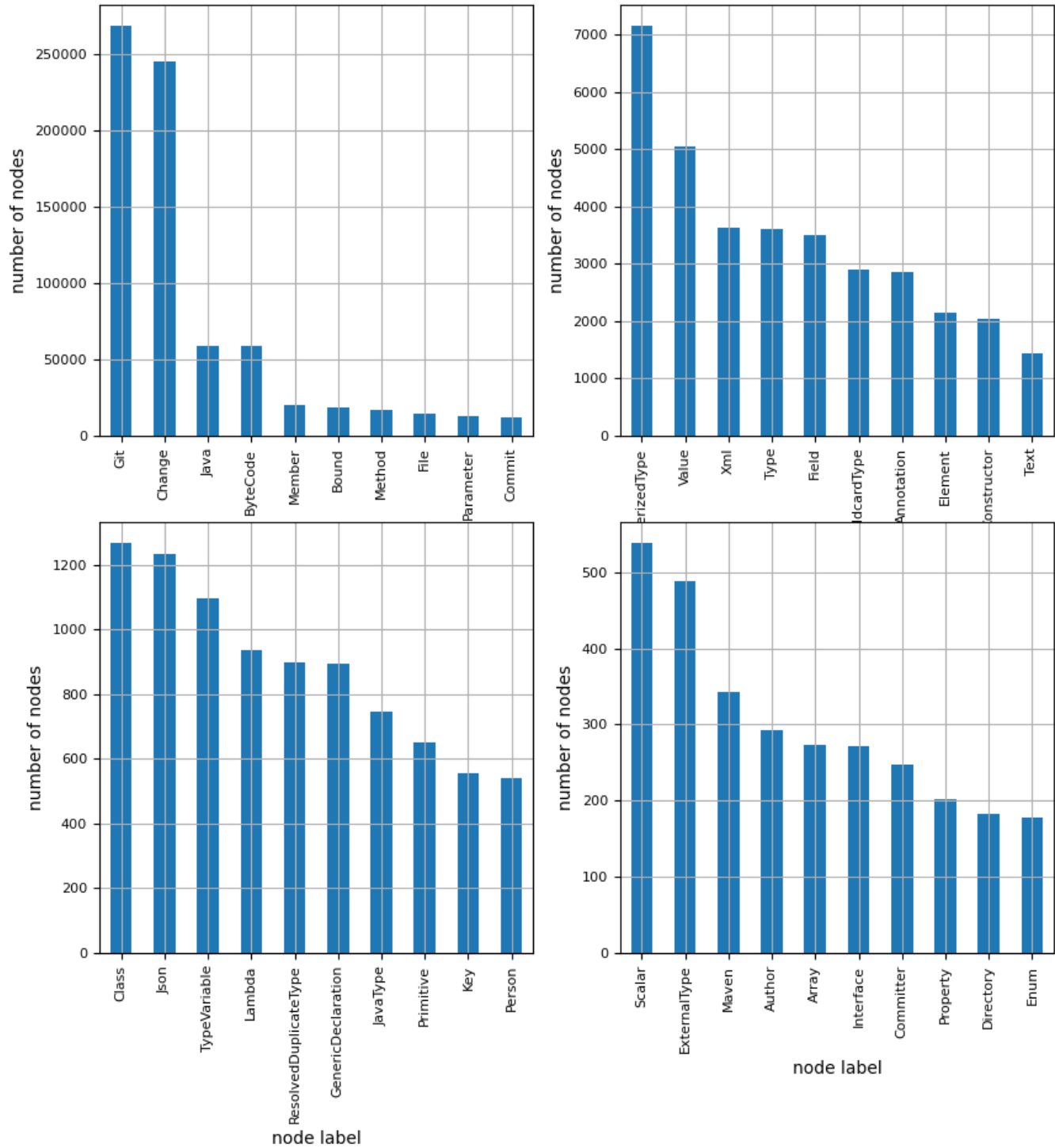
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Git	269022	80.505497
1	Change	245572	73.488027
2	Java	59277	17.738789
3	ByteCode	59089	17.682529
4	Member	20245	6.058366
5	Bound	18438	5.517617
6	Method	16751	5.012778
7	File	14526	4.346941
8	Parameter	13000	3.890282
9	Commit	12038	3.602401
10	ParameterizedType	7166	2.144443
11	Value	5059	1.513918
12	Xml	3643	1.090177
13	Type	3613	1.081199
14	Field	3494	1.045588
15	WildcardType	2906	0.869628
16	Annotation	2864	0.857059
17	Element	2144	0.641597
18	Constructor	2044	0.611672
19	Text	1436	0.429727
20	Class	1269	0.379751
21	Json	1234	0.369278
22	TypeVariable	1096	0.327981
23	Lambda	936	0.280100
24	ResolvedDuplicateType	900	0.269327
25	GenericDeclaration	894	0.267532
26	JavaType	746	0.223242
27	Primitive	650	0.194514
28	Key	555	0.166085
29	Person	541	0.161896
30	Scalar	539	0.161297
31	ExternalType	489	0.146334
32	Maven	343	0.102644
33	Author	293	0.087681
34	Array	273	0.081696
35	Interface	272	0.081397
36	Committer	248	0.074215
37	Property	202	0.060449
38	Directory	183	0.054763
39	Enum	178	0.053267

## 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: 1036637

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	CONTAINS_CHANGE	245572	23.689295
1	MODIFIES	245572	23.689295
2	UPDATES	158949	15.333140
3	CREATES	59718	5.760744
4	DELETES	37194	3.587948
5	INVOKES	35575	3.431770
6	COMMITTED	24076	2.322510
7	DEPENDS_ON	21873	2.109996
8	OF_TYPE	21347	2.059255
9	DECLARES	20686	1.995491
10	OF_RAW_TYPE	17077	1.647346
11	HAS_PARENT	14638	1.412066
12	HAS	14094	1.359589
13	RETURNS	12547	1.210356
14	HAS_COMMIT	12038	1.161255
15	HAS_FILE	10675	1.029772
16	RENAMES	10289	0.992536
17	READS	9076	0.875523
18	HAS_ACTUAL_TYPE_ARGUMENT	8276	0.798351
19	HAS_NEW_NAME	6198	0.597895
20	OF_GENERIC_TYPE	5902	0.569341
21	RESOLVES_TO	5207	0.502297
22	SIMILAR	3968	0.382776
23	CONTAINS	3806	0.367149
24	WRITES	3803	0.366859
25	RETURNS_GENERIC	3543	0.341778
26	ANNOTATED_BY	2809	0.270972
27	REQUIRES	2173	0.209620
28	HAS_FIRST_CHILD	2144	0.206823
29	HAS_LAST_CHILD	2144	0.206823

## 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)

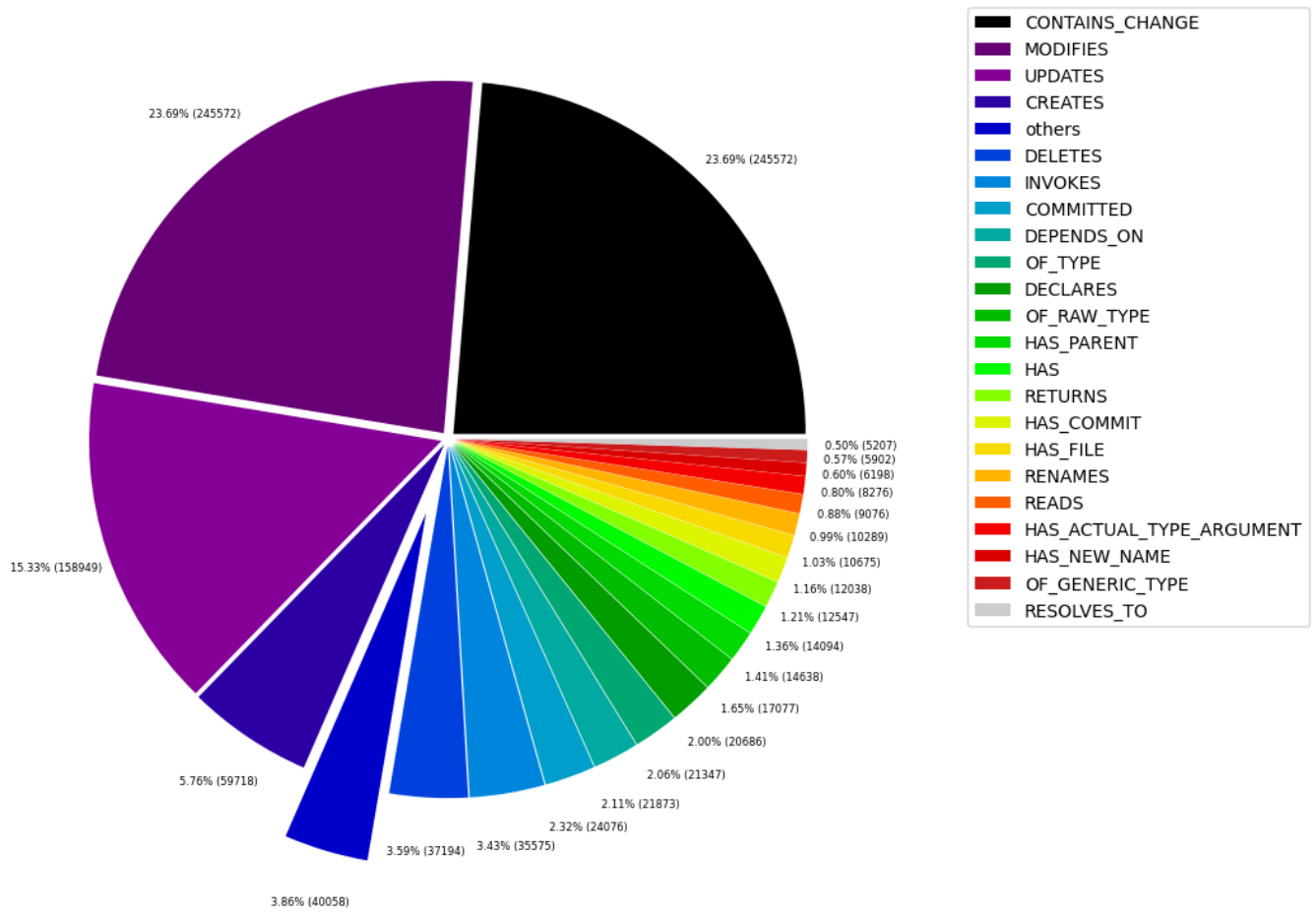


Table 2b - Lowest relationship count by type

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.

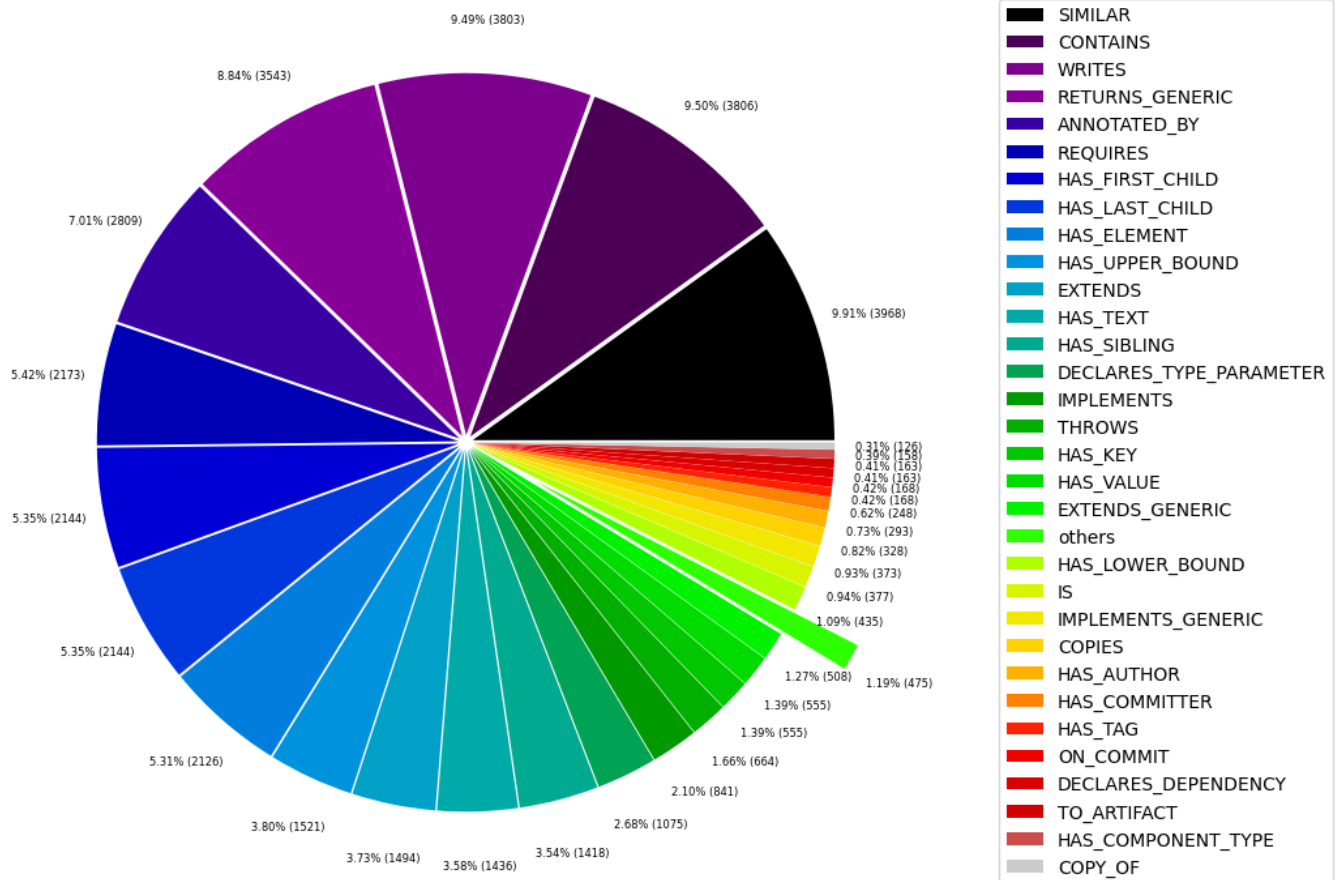
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	HAS_PROPERTY	1	0.000096
1	THROWS_GENERIC	5	0.000482
2	EXCLUDES	5	0.000482
3	HAS_ROOT_ELEMENT	9	0.000868
4	DESCRIBES	9	0.000868
5	HAS_GOAL	16	0.001543
6	HAS_EXECUTION	16	0.001543
7	OF_NAMESPACE	18	0.001736
8	HAS_ATTRIBUTE	18	0.001736
9	INCLUDES_CONCEPT	19	0.001833
10	USES_PLUGIN	21	0.002026
11	REQUIRES_TYPE_PARAMETER	21	0.002026
12	IS_ARTIFACT	21	0.002026
13	HAS_CONFIGURATION	21	0.002026
14	HAS_BRANCH	27	0.002605
15	REQUIRES_CONCEPT	28	0.002701
16	HAS_HEAD	28	0.002701
17	DECLARES_NAMESPACE	36	0.003473
18	HAS_DEFAULT	36	0.003473
19	CONTAINS_VALUE	120	0.011576
20	COPY_OF	126	0.012155
21	HAS_COMPONENT_TYPE	158	0.015242
22	TO_ARTIFACT	163	0.015724
23	DECLARES_DEPENDENCY	163	0.015724
24	ON_COMMIT	168	0.016206
25	HAS_TAG	168	0.016206
26	HAS_COMMITTER	248	0.023924
27	HAS_AUTHOR	293	0.028264
28	COPIES	328	0.031641
29	IMPLEMENTS_GENERIC	373	0.035982

## 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>

Relationship types (less than 0.5% overall)



## 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]	245572		12038
1	[Git, Change]	MODIFIES	[File, Git]	245572		245572
2	[Git, Change]	UPDATES	[File, Git]	158949		245572
3	[Git, Change]	CREATES	[File, Git]	59718		245572
4	[Git, Change]	DELETES	[File, Git]	37194		245572
5	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Method, Member]	21523		13078
6	[Git, Commit]	HAS_PARENT	[Git, Commit]	14629		12038
7	[Repository, File, Git]	HAS_COMMIT	[Git, Commit]	12038		1
8	[Author, Git, Person]	COMMITTED	[Git, Commit]	12038		293
9	[Committer, Git, Person]	COMMITTED	[Git, Commit]	12038		248
10	[Repository, File, Git]	HAS_FILE	[File, Git]	10675		1
11	[Git, Change]	RENAMES	[File, Git]	10289		245572
12	[Java, ByteCode, Method, Member]	HAS	[Java, ByteCode, Parameter]	8297		13078
13	[Java, ByteCode, Method, Member]	READS	[Java, ByteCode, Member, Field]	8100		13078
14	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6360		13000
15	[File, Git]	HAS_NEW_NAME	[File, Git]	6198		10675
16	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3569		7112
17	[Java, ByteCode, Bound, ParameterizedType]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3043		7166
18	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2906		7166
19	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound, ParameterizedType]	2655		13000
20	[Java, ByteCode, Bound, ParameterizedType]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2454		7166
21	[Java, ByteCode, Constructor, Method, Member]	WRITES	[Java, ByteCode, Member, Field]	2426		2040
22	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalType, Ext...	2340		2821
23	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126		2144
24	[Java, ByteCode, Constructor, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2111		2040
25	[Java, ByteCode, Method, Member]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2088		13078
26	[Java, ByteCode, Constructor, Method, Member]	HAS	[Java, ByteCode, Parameter]	2023		2040
27	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2023		13000
28	[Java, ByteCode, Method, Member]	INVOKES	[Java, ByteCode, Constructor, Method, Member]	2007		13078
29	[Java, ByteCode, Method, Member, Lambda]	INVOKES	[Java, ByteCode, Method, Member]	1883		936

## Graph Density

```
total_number_of_nodes (vertices): 334166
total_number_of_relationships (edges): 1036637
-> total directed graph density: 9.283323507321352e-06
-> total directed graph density in percent: 0.0009283323507321352
```