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	[Java, ByteCode, Member, Method]	13287	20.322418
1	[Java, ByteCode, Parameter]	13029	19.927808
2	[Java, ByteCode, ParameterizedType, Bound]	7176	10.975666
3	[Java, ByteCode, Bound]	7118	10.886955
4	[Java, ByteCode, Member, Field]	3511	5.370062
5	[Java, ByteCode, Bound, WildcardType]	2908	4.447775
6	[Java, Value, ByteCode, Annotation]	2822	4.316239
7	[Xml, Element]	2144	3.279240
8	[Java, ByteCode, Member, Constructor, Method]	2067	3.161469
9	[Xml, Text]	1436	2.196357
10	[Java, ByteCode, Bound, TypeVariable]	1096	1.676328
11	[Java, ByteCode, Member, Method, Lambda]	942	1.440786
12	[Type, File, Java, ByteCode, ResolvedDuplicate...	877	1.341368
13	[Type, File, Java, ByteCode, Class]	810	1.238892
14	[Java, Value, ByteCode, Primitive]	652	0.997232
15	[Type, File, Java, ByteCode, JavaType]	644	0.984996
16	[Java, ByteCode, Member, Method, GenericDeclar...	569	0.870283
17	[Json, Key]	568	0.868754
18	[Value, Json, Scalar]	551	0.842752
19	[Type, File, Java, ByteCode, ExternalType]	380	0.581209
20	[Value, Array]	267	0.408376
21	[Type, File, Java, ByteCode, Class, GenericDec...	236	0.360961
22	[Value, Property]	202	0.308958
23	[Type, File, Java, ByteCode, Interface]	188	0.287545
24	[Java, Value, ByteCode, Class]	172	0.263073
25	[Maven, Dependency]	163	0.249308
26	[Java, ByteCode, Bound, GenericArrayType]	158	0.241660
27	[Java, Value, ByteCode, Enum]	150	0.229424
28	[Package, File, Directory, Java]	139	0.212600
29	[Value, Json, Object]	135	0.206482

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)

Legend:
- ['Java', 'ByteCode', 'Member', 'Method']
- ['Java', 'ByteCode', 'Parameter']
- ['Java', 'ByteCode', 'ParameterizedType', 'Bound']
- ['Java', 'ByteCode', 'Bound']
- ['Java', 'ByteCode', 'Member', 'Field']
- ['Java', 'ByteCode', 'Bound', 'WildcardType']
- ['Java', 'Value', 'ByteCode', 'Annotation']
- others
- ['Xml', 'Element']
- ['Java', 'ByteCode', 'Member', 'Constructor', 'Method']
- ['Xml', 'Text']
- ['Java', 'ByteCode', 'Bound', 'TypeVariable']
- ['Java', 'ByteCode', 'Member', 'Method', 'Lambda']
- ['Type', 'File', 'Java', 'ByteCode', 'ResolvedDuplicateType']
- ['Type', 'File', 'Java', 'ByteCode', 'Class']
- ['Java', 'Value', 'ByteCode', 'Primitive']
- ['Type', 'File', 'Java', 'ByteCode', 'JavaType']
- ['Java', 'ByteCode', 'Member', 'Method', 'GenericDeclaration']
- ['Json', 'Key']
- ['Value', 'Json', 'Scalar']
- ['Type', 'File', 'Java', 'ByteCode', 'ExternalType']

Pie chart values:
- 19.93% (13029)
- 20.32% (13287)
- 10.98% (7176)
- 10.89% (7118)
- 5.37% (3511)
- 4.45% (2908)
- 4.32% (2822)
- 4.27% (2794)
- 3.28% (2144)
- 3.16% (2067)
- 2.20% (1436)
- 1.68% (1096)
- 1.44% (942)
- 1.34% (877)
- 1.24% (810)
- 1.00% (652)
- 0.98% (644)
- 0.87% (569)
- 0.87% (568)
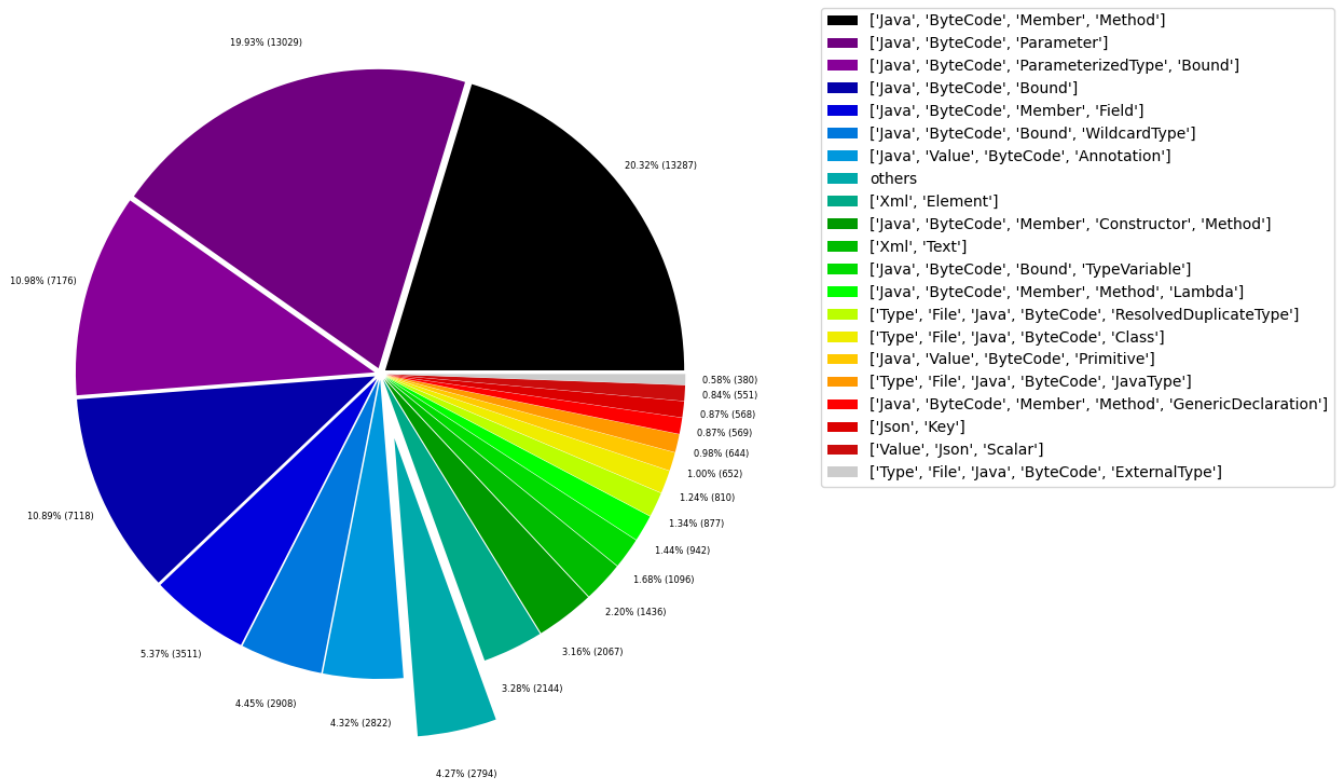- 0.84% (551)
- 0.58% (380)

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	0.001529
1	[Package, File, Json, NPM]	1	0.001529
2	[File, TS, Scan]	1	0.001529
3	[Repository, File, Git]	1	0.001529
4	[Git, Tag]	1	0.001529
5	[Author, Git, Person]	1	0.001529
6	[Committer, Git, Person]	1	0.001529
7	[Git, Branch]	1	0.001529
8	[Git, Commit]	1	0.001529
9	[File, Json]	2	0.003059
10	[File]	3	0.004588
11	[Java, ByteCode, Member, Constructor, Method, ...	4	0.006118
12	[Maven, Exclusion]	5	0.007647
13	[Value, Json, Array]	6	0.009177
14	[Dependency, NPM]	7	0.010706
15	[Artifact, File, Jar, Archive, Zip, Java]	9	0.013765
16	[File, Java, Manifest]	9	0.013765
17	[Type, File, Java, ByteCode, Void]	9	0.013765
18	[File, Maven, Xml, Pom, Document]	9	0.013765
19	[Java, ManifestSection]	9	0.013765
20	[File, Java, ServiceLoader]	10	0.015295
21	[File, Java, Properties]	12	0.018354
22	[Maven, ExecutionGoal]	16	0.024472
23	[Maven, PluginExecution]	16	0.024472
24	[Type, File, Java, ByteCode, Throwable, Extern...	16	0.024472
25	[Xml, Attribute]	18	0.027531
26	[jQAssistant, Rule, Concept]	19	0.029060
27	[Maven, Plugin]	21	0.032119
28	[Maven, Configuration]	21	0.032119
29	[Type, File, Java, ByteCode, Throwable, Resolv...	22	0.033649

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)

Legend:
- ['Value', 'Array']
- ['Type', 'File', 'Java', 'ByteCode', 'Class', 'GenericDeclaration']
- ['Value', 'Property']
- ['Type', 'File', 'Java', 'ByteCode', 'Interface']
- ['Java', 'Value', 'ByteCode', 'Class']
- ['Maven', 'Dependency']
- ['Java', 'ByteCode', 'Bound', 'GenericArrayType']
- ['Java', 'Value', 'ByteCode', 'Enum']
- ['Package', 'File', 'Directory', 'Java']
- ['Value', 'Json', 'Object']
- ['Value', 'ManifestEntry']
- ['Type', 'File', 'Java', 'ByteCode', 'Throwable', 'JavaType']
- ['Type', 'File', 'Java', 'ByteCode', 'ExternalAnnotation', 'ExternalType']
- ['Artifact', 'Maven']
- ['Type', 'File', 'Java', 'ByteCode', 'GenericDeclaration', 'Interface']
- ['Type', 'File', 'Java', 'ByteCode', 'Class', 'Throwable']
- ['File', 'Directory']
- ['Type', 'File', 'Java', 'ByteCode', 'Annotation']
- ['Xml', 'Namespace']
- others
- ['Type', 'File', 'Java', 'ByteCode', 'PrimitiveType']
- ['Type', 'File', 'Java', 'ByteCode', 'Enum']
- ['Type', 'File', 'Java', 'ByteCode', 'Throwable', 'ResolvedDuplicateType']
- ['Maven', 'Plugin']
- ['Maven', 'Configuration']
- ['jQAssistant', 'Rule', 'Concept']
- ['Xml', 'Attribute']
- ['Maven', 'ExecutionGoal']
- ['Type', 'File', 'Java', 'ByteCode', 'Throwable', 'ExternalType']
- ['Maven', 'PluginExecution']
- ['File', 'Java', 'Properties']
- ['File', 'Java', 'ServiceLoader']
- ['File', 'Java', 'Manifest']
- ['Type', 'File', 'Java', 'ByteCode', 'Void']
- ['File', 'Maven', 'Xml', 'Pom', 'Document']
- ['Java', 'ManifestSection']
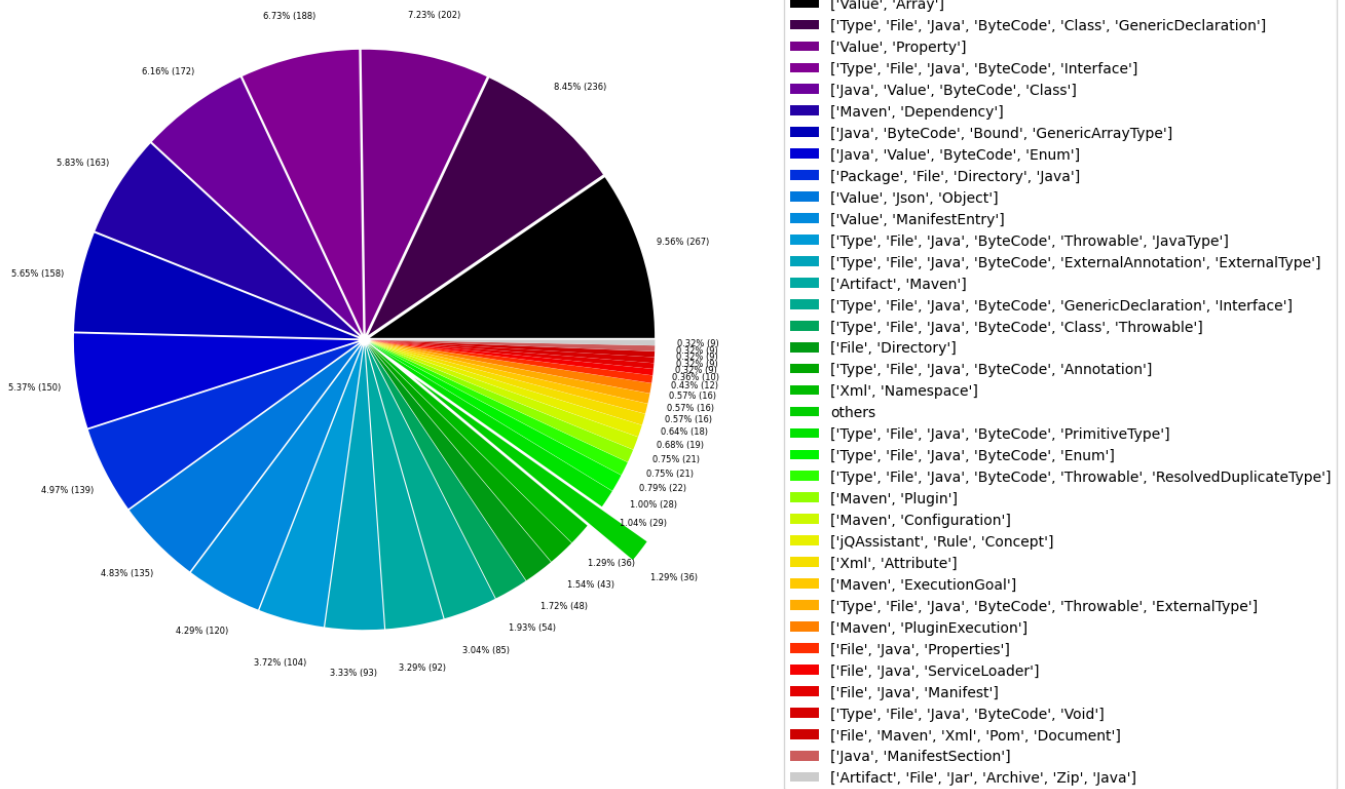- ['Artifact', 'File', 'Jar', 'Archive', 'Zip', 'Java']

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.
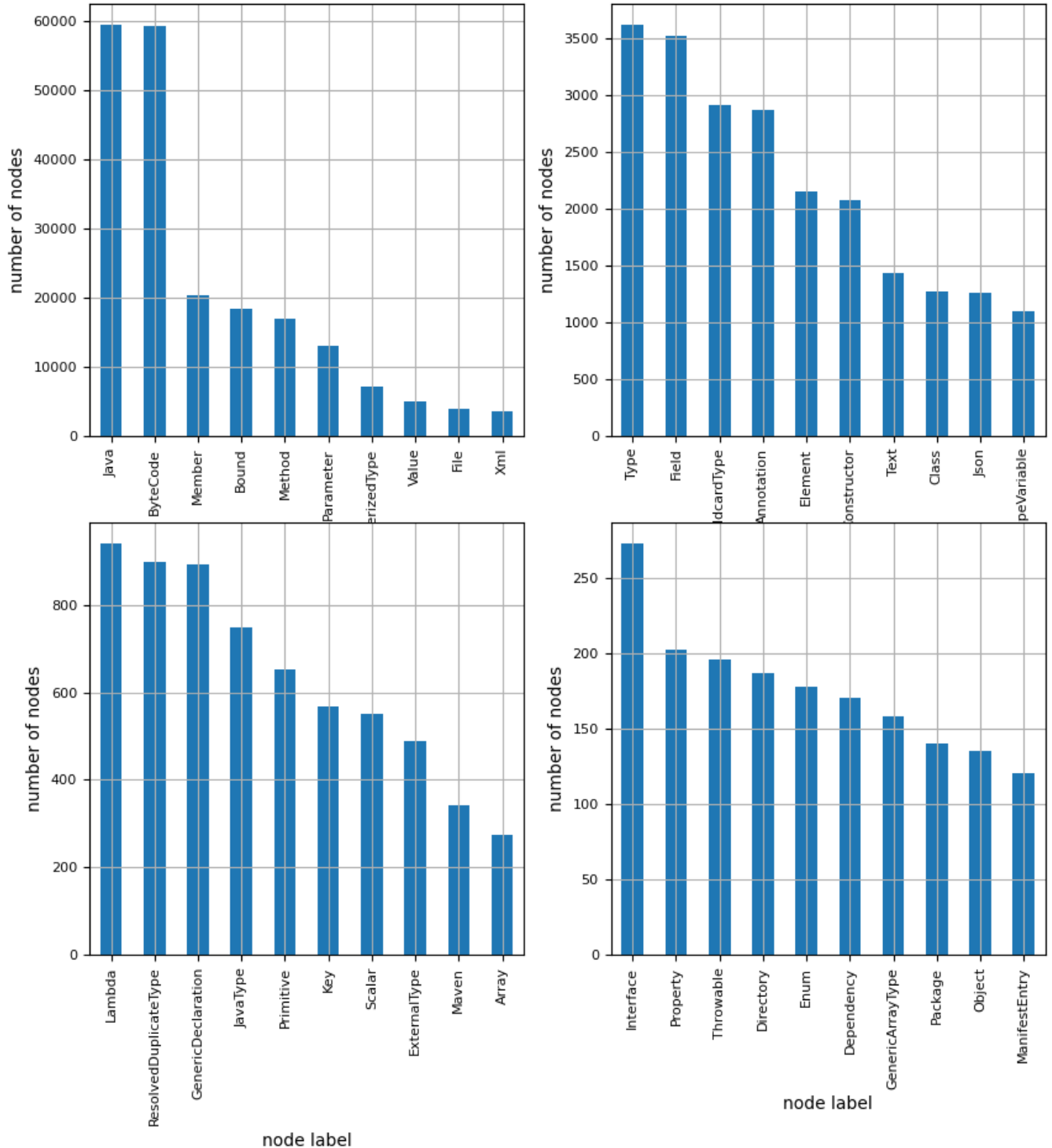
	nodeLabel	nodesWithThatLabel	nodesWithThatLabelPercent
0	Java	59467	90.954559
1	ByteCode	59279	90.667013
2	Member	20380	31.171135
3	Bound	18456	28.228384
4	Method	16869	25.801074
5	Parameter	13029	19.927808
6	ParameterizedType	7176	10.975666
7	Value	5077	7.765253
8	File	3862	5.906915
9	Xml	3643	5.571955
10	Type	3618	5.533718
11	Field	3511	5.370062
12	WildcardType	2908	4.447775
13	Annotation	2865	4.382007
14	Element	2144	3.279240
15	Constructor	2071	3.167587
16	Text	1436	2.196357
17	Class	1272	1.945519
18	Json	1263	1.931754
19	TypeVariable	1096	1.676328
20	Lambda	942	1.440786
21	ResolvedDuplicateType	899	1.375017
22	GenericDeclaration	894	1.367370
23	JavaType	748	1.144063
24	Primitive	652	0.997232
25	Key	568	0.868754
26	Scalar	551	0.842752
27	ExternalType	489	0.747924
28	Maven	343	0.524617
29	Array	273	0.417552
30	Interface	273	0.417552
31	Property	202	0.308958
32	Throwable	196	0.299781
33	Directory	187	0.286016
34	Enum	178	0.272250
35	Dependency	170	0.260014
36	GenericArrayType	158	0.241660
37	Package	140	0.214129
38	Object	135	0.206482
39	ManifestEntry	120	0.183540

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: 209889
```

	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	INVOKES	36005	17.154305
1	DEPENDS_ON	21931	10.448856
2	OF_TYPE	21394	10.193007
3	DECLARES	20825	9.921911
4	OF_RAW_TYPE	17093	8.143828
5	HAS	14125	6.729748
6	RETURNS	12578	5.992691
7	READS	9166	4.367070
8	HAS_ACTUAL_TYPE_ARGUMENT	8288	3.948754
9	OF_GENERIC_TYPE	5906	2.813868
10	SIMILAR	3977	1.894811
11	CONTAINS	3824	1.821915
12	WRITES	3818	1.819057
13	RETURNS_GENERIC	3545	1.688988
14	ANNOTATED_BY	2810	1.338803
15	RESOLVES_TO	2619	1.247802
16	REQUIRES	2174	1.035786
17	HAS_FIRST_CHILD	2144	1.021492
18	HAS_LAST_CHILD	2144	1.021492
19	HAS_ELEMENT	2126	1.012916
20	HAS_UPPER_BOUND	1523	0.725622
21	EXTENDS	1498	0.713711
22	HAS_TEXT	1436	0.684171
23	HAS_SIBLING	1418	0.675595
24	THROWS	1357	0.646532
25	DECLARES_TYPE_PARAMETER	1075	0.512175
26	IMPLEMENTS	843	0.401641
27	HAS_KEY	568	0.270619
28	HAS_VALUE	568	0.270619
29	EXTENDS_GENERIC	508	0.242033

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>
```
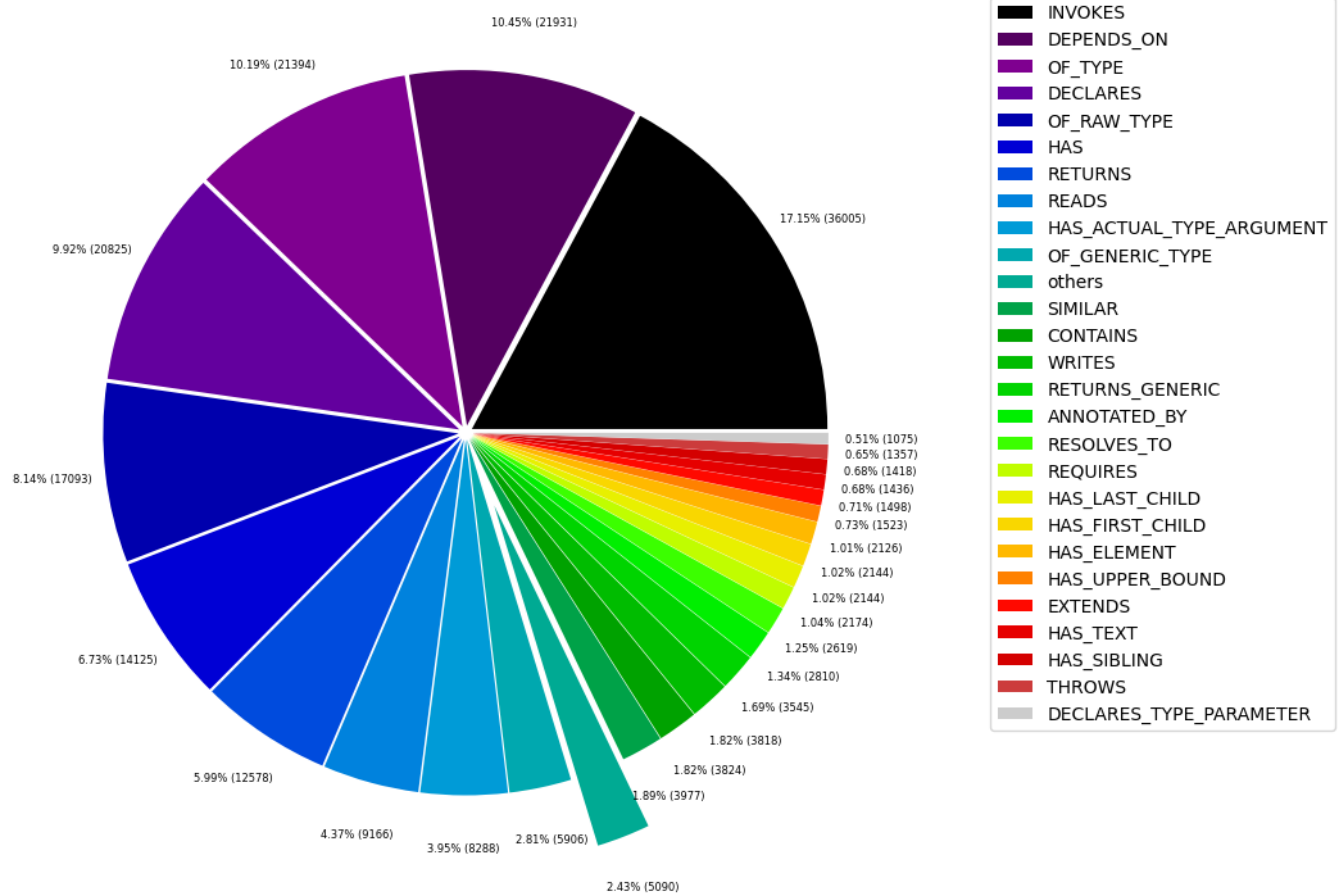
Relationship types (more than 0.5% overall)

■	INVOKES
■	DEPENDS_ON
■	OF_TYPE
■	DECLARES
■	OF_RAW_TYPE
■	HAS
■	RETURNS
■	READS
■	HAS_ACTUAL_TYPE_ARGUMENT
■	OF_GENERIC_TYPE
■	others
■	SIMILAR
■	CONTAINS
■	WRITES
■	RETURNS_GENERIC
■	ANNOTATED_BY
■	RESOLVES_TO
■	REQUIRES
■	HAS_LAST_CHILD
■	HAS_FIRST_CHILD
■	HAS_ELEMENT
■	HAS_UPPER_BOUND
■	EXTENDS
■	HAS_TEXT
■	HAS_SIBLING
■	THROWS
■	DECLARES_TYPE_PARAMETER

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.
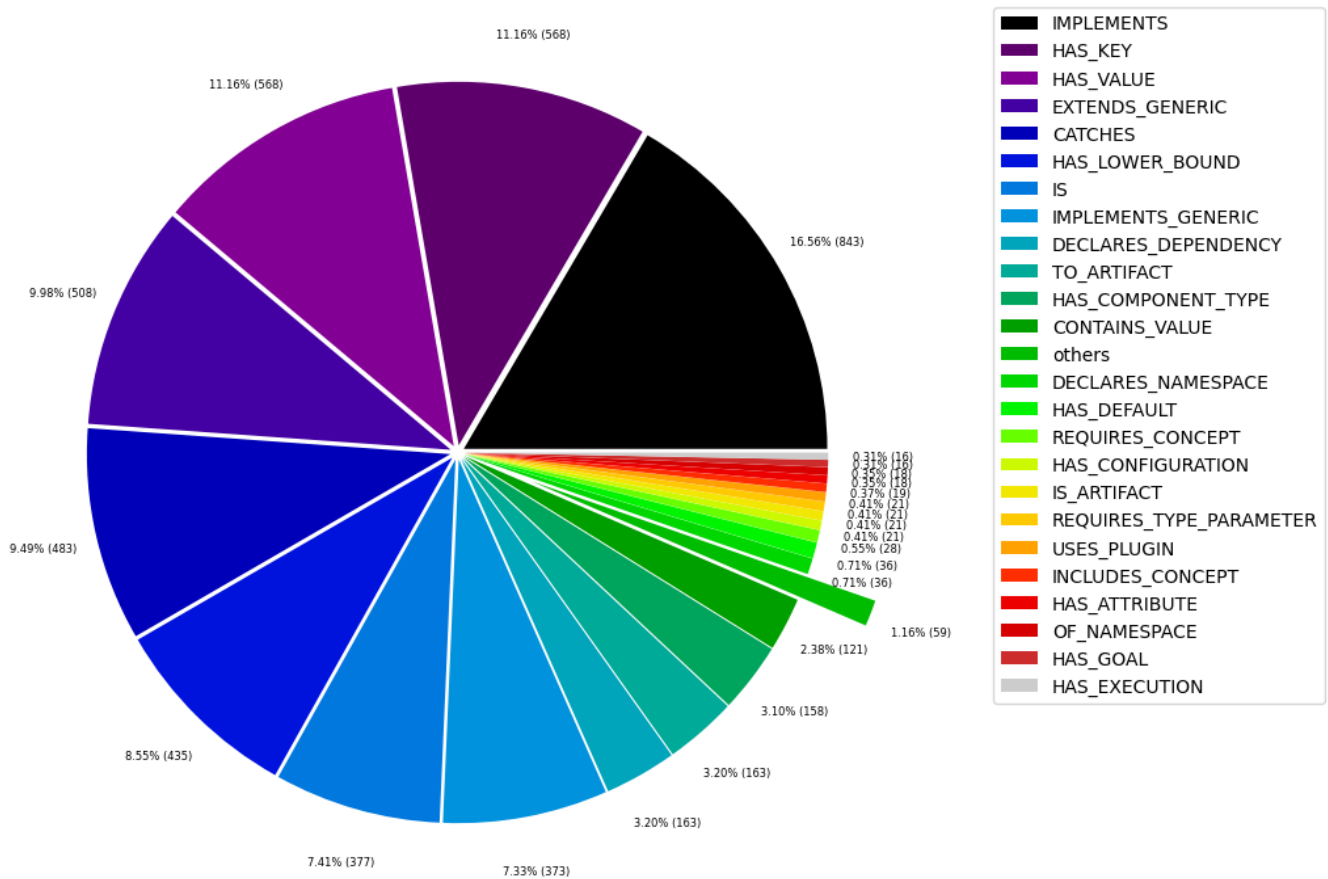
	relationshipType	nodesWithThatRelationshipType	nodesWithThatRelationshipTypePercent
0	ON_COMMIT	1	0.000476
1	HAS_AUTHOR	1	0.000476
2	HAS_BRANCH	1	0.000476
3	HAS_TAG	1	0.000476
4	HAS_COMMITTER	1	0.000476
5	HAS_PROPERTY	1	0.000476
6	HAS_COMMIT	1	0.000476
7	HAS_HEAD	2	0.000953
8	COMMITTED	2	0.000953
9	THROWS_GENERIC	5	0.002382
10	EXCLUDES	5	0.002382
11	DECLARES_DEV_DEPENDENCY	7	0.003335
12	HAS_PARENT	9	0.004288
13	DESCRIBES	9	0.004288
14	HAS_ROOT_ELEMENT	13	0.006194
15	HAS_EXECUTION	16	0.007623
16	HAS_GOAL	16	0.007623
17	OF_NAMESPACE	18	0.008576
18	HAS_ATTRIBUTE	18	0.008576
19	INCLUDES_CONCEPT	19	0.009052
20	USES_PLUGIN	21	0.010005
21	REQUIRES_TYPE_PARAMETER	21	0.010005
22	IS_ARTIFACT	21	0.010005
23	HAS_CONFIGURATION	21	0.010005
24	REQUIRES_CONCEPT	28	0.013340
25	HAS_DEFAULT	36	0.017152
26	DECLARES_NAMESPACE	36	0.017152
27	CONTAINS_VALUE	121	0.057650
28	HAS_COMPONENT_TYPE	158	0.075278
29	TO_ARTIFACT	163	0.077660

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)

Legend:
- IMPLEMENTS
- HAS_KEY
- HAS_VALUE
- EXTENDS_GENERIC
- CATCHES
- HAS_LOWER_BOUND
- IS
- IMPLEMENTS_GENERIC
- DECLARES_DEPENDENCY
- TO_ARTIFACT
- HAS_COMPONENT_TYPE
- CONTAINS_VALUE
- others
- DECLARES_NAMESPACE
- HAS_DEFAULT
- REQUIRES_CONCEPT
- HAS_CONFIGURATION
- IS_ARTIFACT
- REQUIRES_TYPE_PARAMETER
- USES_PLUGIN
- INCLUDES_CONCEPT
- HAS_ATTRIBUTE
- OF_NAMESPACE
- HAS_GOAL
- HAS_EXECUTION

Pie chart values:
- 16.56% (843)
- 11.16% (568)
- 11.16% (568)
- 9.98% (508)
- 9.49% (483)
- 8.55% (435)
- 7.41% (377)
- 7.33% (373)
- 3.20% (163)
- 3.20% (163)
- 3.10% (158)
- 2.38% (121)
- 1.16% (59)
- 0.71% (36)
- 0.71% (36)
- 0.55% (28)
- 0.41% (21)
- 0.41% (21)
- 0.41% (21)
- 0.41% (21)
- 0.37% (19)
- 0.35% (18)
- 0.35% (18)
- 0.31% (16)

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	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Method]	21955	13195	
1	[Java, ByteCode, Member, Method]	HAS	[Java, ByteCode, Parameter]	8361	13195	
2	[Java, ByteCode, Member, Method]	READS	[Java, ByteCode, Member, Field]	8192	13195	
3	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, JavaType]	6079	13029	
4	[Type, File, Java, ByteCode, Class]	DECLARES	[Java, ByteCode, Member, Method]	5016	760	
5	[Type, File, Java, ByteCode, Class]	DEPENDS_ON	[Type, File, Java, ByteCode, JavaType]	3995	760	
6	[Java, ByteCode, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3427	7118	
7	[Java, ByteCode, ParameterizedType, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, JavaType]	3053	7176	
8	[Java, ByteCode, ParameterizedType, Bound]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, WildcardType]	2908	7176	
9	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, ParameterizedType, Bound]	2657	13029	
10	[Java, ByteCode, ParameterizedType, Bound]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound, TypeVariable]	2454	7176	
11	[Java, ByteCode, Member, Constructor, Method]	WRITES	[Java, ByteCode, Member, Field]	2438	2067	
12	[Java, Value, ByteCode, Annotation]	OF_TYPE	[Type, File, Java, ByteCode, ExternalAnnotatio...]	2341	2822	
13	[Xml, Element]	HAS_ELEMENT	[Xml, Element]	2126	2144	
14	[Java, ByteCode, Member, Constructor, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2123	2067	
15	[Type, File, Java, ByteCode, Class]	DECLARES	[Java, ByteCode, Member, Field]	2090	760	
16	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, JavaType]	2078	13195	
17	[Type, File, Java, ByteCode, Class, GenericDec...]	DECLARES	[Java, ByteCode, Member, Method]	2070	229	
18	[Java, ByteCode, Member, Method]	INVOKES	[Java, ByteCode, Member, Constructor, Method]	2031	13195	
19	[Java, ByteCode, Member, Constructor, Method]	HAS	[Java, ByteCode, Parameter]	2027	2067	
20	[Java, ByteCode, Parameter]	OF_GENERIC_TYPE	[Java, ByteCode, Bound]	2022	13029	
21	[Java, ByteCode, Member, Method, Lambda]	INVOKES	[Java, ByteCode, Member, Method]	1889	942	
22	[Java, ByteCode, Member, Constructor, Method]	INVOKES	[Java, ByteCode, Member, Method]	1817	2067	
23	[Java, ByteCode, ParameterizedType, Bound]	HAS_ACTUAL_TYPE_ARGUMENT	[Java, ByteCode, Bound]	1807	7176	
24	[Java, ByteCode, Member, Method]	RETURNS	[Type, File, Java, ByteCode, Void]	1776	13195	
25	[Java, ByteCode, Parameter]	ANNOTATED_BY	[Java, Value, ByteCode, Annotation]	1731	13029	
26	[Java, ByteCode, Member, Method, GenericDeclar...]	INVOKES	[Java, ByteCode, Member, Method]	1711	557	

	sourceLabels	relationType	targetLabels	numberOfRelationships	numberOfNodesWithSameLabelsAsSource	numberOfNodesWithS
27	[Java, ByteCode, ParameterizedType, Bound]	OF_RAW_TYPE	[Type, File, Java, ByteCode, GenericDeclaratio...]	1535	7176	
28	[Type, File, Java, ByteCode, JavaType]	DECLARES	[Java, ByteCode, Member, Method]	1509	644	
29	[Java, ByteCode, Parameter]	OF_TYPE	[Type, File, Java, ByteCode, ResolvedDuplicate...]	1498	13029	

Graph Density

```
total_number_of_nodes (vertices): 65381
total_number_of_relationships (edges): 209889
-> total directed graph density: 4.910132405115117e-05
-> total directed graph density in percent: 0.004910132405115117
```