Item 54
git_comments:

1. * Holds statistics for a DocValues field.
2. * * Called after #{@link DocValuesStats#accumulate(int)} was processed and verified that the document has a value for * the field. Implementations should update the statistics based on the value of the current document. * * @param count * the updated number of documents with value for this field.
3. * The number of documents which have a value of the field.
4. * The maximum value of the field. Undefined when {@link #count} is zero.
5. * Returns whether the given document has a value for the requested DocValues field.
6. * The field for which these stats were computed.
7. * Licensed to the Apache Software Foundation (ASF) under one or more * contributor license agreements. See the NOTICE file distributed with * this work for additional information regarding copyright ownership. * The ASF licenses this file to You under the Apache License, Version 2.0 * (the "License"); you may not use this file except in compliance with * the License. You may obtain a copy of the License at * * http://www.apache.org/licenses/LICENSE-2.0 * * Unless required by applicable law or agreed to in writing, software * distributed under the License is distributed on an "AS IS" BASIS, * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. * See the License for the specific language governing permissions and * limitations under the License.
8. * The mean of all values of the field. Undefined when {@link #count} is zero.
9. * Holds DocValues statistics for a numeric field storing {@code double} values.
10. * * Initializes this object with the given reader context. Returns whether stats can be computed for this segment (i.e. * it does have the requested DocValues field).
11. * Holds DocValues statistics for a numeric field storing {@code long} values.
12. * Holds statistics for a numeric DocValues field.
13. * The minimum value of the field. Undefined when {@link #count} is zero.
14. **comment:** * The number of documents which do not have a value of the field.
    label: documentation
15. All matching documents in this reader are missing a value
16. * A {@link Collector} which computes statistics for a DocValues field.
17. * Licensed to the Apache Software Foundation (ASF) under one or more * contributor license agreements. See the NOTICE file distributed with * this work for additional information regarding copyright ownership. * The ASF licenses this file to You under the Apache License, Version 2.0 * (the "License"); you may not use this file except in compliance with * the License. You may obtain a copy of the License at * * http://www.apache.org/licenses/LICENSE-2.0 * * Unless required by applicable law or agreed to in writing, software * distributed under the License is distributed on an "AS IS" BASIS, * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. * See the License for the specific language governing permissions and * limitations under the License.
18. * Creates a collector to compute statistics for a DocValues field using the given {@code stats}.
19. Stats cannot be computed for this segment, therefore consider all matching documents as a 'miss'.
20. * Licensed to the Apache Software Foundation (ASF) under one or more * contributor license agreements. See the NOTICE file distributed with * this work for additional information regarding copyright ownership. * The ASF licenses this file to You under the Apache License, Version 2.0 * (the "License"); you may not use this file except in compliance with * the License. You may obtain a copy of the License at * * http://www.apache.org/licenses/LICENSE-2.0 * * Unless required by applicable law or agreed to in writing, software * distributed under the License is distributed on an "AS IS" BASIS, * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. * See the License for the specific language governing permissions and * limitations under the License.
21. 20% of cases delete some docs
22. * Unit tests for {@link DocValuesStatsCollector}.
23. not all documents have a value

git_commits:

1. **summary:** LUCENE-7590: add DocValuesStatsCollector
   message: LUCENE-7590: add DocValuesStatsCollector

github_issues:

github_issues_comments:

github_pulls:

github_pulls_comments:

github_pulls_reviews:

jira_issues:

1. **summary:** Add DocValues statistics helpers
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jira_issues_comments:

1. **body:** First patch adds numeric statistics. I'd appreciate comments about it before I add support for sorted-numeric (including, whether we should!). Note that I chose to take either a field or {{ValueSource}}. The latter gives some flexibility by allowing users to pass an arbitrary VS over e.g. an {{Expression}} over a numeric DV field. This, as far as I could tell, does not apply to {{SortedNumericDV}}, or at least I couldn't find an existing {{ValueSource}} implementation (like {{LongFieldSource}}) for {{SortedNumericDV}}. If this approach looks good, I'd like to refactor the class so that it's easy to share/reuse code between Long and Double NDV fields.
   label: code-design
2. Thanks [~shaie]. Maybe instead of a new stepping-stone class that the user must invoke, {{DocsAndContexts}}, you could just define a functional interface: {noformat} (LeafReaderContext ctx) -> DocIdSetIterator {noformat} And then maybe instead of a new class that computes stats in its ctor, {{NumericLongDocValuesStats}}, you could offer a static method instead, taking a top-level reader and the above function, that computes the stats and returns a results class holding the min/max/mean/etc.? Seems like that might be a simpler way to expose the functionality...
3. I would not even define an own functional interface, just use {{java.util.function.Function<LeafReaderContext,DocIdSetIterator>}}: https://docs.oracle.com/javase/8/docs/api/java/util/function/Function.html This only works if the function does not throw checked exceptions. Otherwise a new functional interface is needed.
4. Thanks [~mikemccand] and [~thetaphi], I changed to a static class and removed {{DocsAndContexts}} in favor of a new {{Function<LeafReaderContext,DocIdSetIterator>}}. Maybe {{BitsDocIdSetIterator}} can go in separately (i.e. a separate issue)? As I think it's a useful utility to have anyway.
5. Thanks [~shaie] the patch looks great!
6. **body:** bq. Maybe BitsDocIdSetIterator can go in separately (i.e. a separate issue)? It took us a lot of efforts to remove slow iterators so I'd like to not add them back. Let's implement the computation of these stats by writing a Collector and use a MatchAllDocsQuery? Why is {{missing}} undefined when {{count}} is zero?
   label: code-design
7. **body:** bq. Let's implement the computation of these stats by writing a Collector and use a MatchAllDocsQuery? At first I thought this is an overkill, but a {{Collector}} will allow computing them for documents that match another query. I will explore that option. bq. Why is missing undefined when count is zero? I thought that if you have no documents in the index at all, then {{missing}} is undefined, but now that you ask the question, I guess in that case it's fine if it's {{0}}, like {{count}}. I'll change the docs.
   label: documentation
8. **body:** Patch implements a {{DocValuesStatsCollector}}. Note some key design decisions: A {{DocValuesStats}} is responsible for providing the specific {{DocValuesIterator}} for a {{LeafReaderContext}}. It then accumulates the value, computes missing and other statistics. It computes {{missing}} and {{count}}, leaving {{min}} and {{max}} to the actual implementation. Also, this stats

does not define a {{mean}}, as at least for now I'm not sure how the mean value of a {{SortedSetDocValues}} is defined. An abstract {{NumericDocValuesStats}} implementation for single-numeric DV fields, which also adds a {{mean}} statistic, with two concrete implementations: {{LongNumericDocValuesStats}} and {{DoubleNumericDocValuesStats}}. This hierarchy should allow us to add further statistics for {{SortedSet}} and {{SortedNumeric}} DV fields. I did not implement them yet, as I'm not sure about some of the statistics (e.g. should the {{mean}} stat of a {{SortedNumeric}} be the mean across all values, or the minimum per document or ...). Let's discuss that separately. Also, note that I had to make {{DocValuesIterator}} public in order to declare it in this collector. If you're OK with the design and implementation, I want to separate {{DovValuesStats}} to its own file, for clarity. I did not do it yet though.
label: code-design

9. Added tests for {{DoubleNumericDocValuesStats}}. Now that I review the class names, how do you feel about removing {{Numeric}} from the concrete classes, so they're called {{Long/DoubleDocValuesStats}}?
10. Instead of using a NOOP_COLLECTOR, you could throw a CollectionTerminatedException, which will skip the segment entirely. By the way, in such cases I think we should still increase the missing count? Can we avoid making {{DocValuesIterator}} public?
11. bq. how do you feel about removing Numeric from the concrete classes, so they're called Long/DoubleDocValuesStats? Fine with me.
12. **body:** bq. Instead of using a NOOP_COLLECTOR, you could throw a CollectionTerminatedException OK, good idea. bq. By the way, in such cases I think we should still increase the missing count? I am not sure? I mean, {{missing}} represents all the documents that matched the query and did not have a value for that DV field. But when {{getLeafCollector}} is called, we don't know yet that any documents will be matched by the query at all (I think?) and therefore updating missing might be confusing? I.e., I'd expect that if anyone chained {{TotalHitsCollector}} with {{DocValuesStatsCollector}}, then {{totalHits = stats.count() + stats.missing()}}? I am open to discuss it, just not sure I always want to update missing with {{context.reader().numDocs()}} ... bq. Can we avoid making DocValuesIterator public? I did not find a way, since it's part of {{DocValuesStats.init()}} API and I think users should be able to provide their own {{Stats}} impl, e.g. if they want to compute something on a {{BinaryDocValues}} field? Here too, I'd love to get more ideas though. I tried to avoid implementing N collectors, one for each DV type, where they share a large portion of the code. But if you have strong opinions about making {{DVI}} public, maybe that's what we should do ...
label: code-design
13. **body:** [~jpountz] I accept your proposal about missing, only in case a reader does not have the requested DV field, the collector returns a {{LeafCollector}} which updates {{missing}} for every hit document. I also renamed the classes as proposed earlier, as well extracted {{DocValuesStats}} and friends to its own class. I still didn't address changing {{DocValuesIterator}} to public. BTW, I noticed that {{SimpleTextDocValuesReader}} defines a private class named {{DocValuesIterator}} with exactly the same signature, I assume because the other one is package-private. So I feel that changing {{DVI}} to public is beneficial beyond the scope of this issue alone. What do you think?
label: code-design
14. **body:** Thanks, the missing change and the rename look good to me. Regarding DocValuesIterator, I think in the simple text case, it is really an impl detail, and the one in core is only really used to share the declaration of {{advanceExact}}. My feeling is that making it public is only useful here because the way stats are computed is very abstracted with generics and inheritance, so I am not convinced this use-case requires that we make DocValuesIterator public. I would rather either avoid abstracting so much or define a functional interface in the stats package that only defines an advanceExact method and use method references to be able to share computation across the various doc value types. Maybe we can also make the collector pkg-private, it does not seem to need to be public, does it?
label: code-design
15. Patch changes {{DocValuesIterator}} package-private again and adds an API to {{DocValuesStats}} to help in determining whether a document has or does not have a value for the field. The Collector needs to be public because you're supposed to initialize it and run a search with it.
16. +1
17. Commit ad7152ad4739a47aa2b45405ba1682b3dda18923 in lucene-solr's branch refs/heads/master from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=ad7152a] LUCENE-7590: add DocValuesStatsCollector
18. Commit 43f4f7a279553913aadfdd684d9cdcff0a5f4220 in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=43f4f7a] LUCENE-7590: add

DocValuesStatsCollector
19. Commit e09ef681e4d36adb8987ca0cda6bcb3221830102 in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=e09ef68] Revert "LUCENE-7590: add DocValuesStatsCollector" This reverts commit 43f4f7a279553913aadfdd684d9cdcff0a5f4220.
20. Commit 7269c484a4a0dd147a445a4b676144592f0aa60f in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=7269c48] LUCENE-7590: add DocValuesStatsCollector
21. **body:** Commit 85582dabe4372085e1af5d01ebbfcfd0303b9f12 in lucene-solr's branch refs/heads/master from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=85582da] LUCENE-7590: fix typo in method parameter
    label: documentation
22. There are now few tasks left: * Add more statistics, such as {{sum}} and {{stdev}} (for numeric fields). Should we care about overflow, or only document it? * We can also compute more stats like what Solr gives in [Stats Component|https://cwiki.apache.org/confluence/display/solr/The+Stats+Component#TheStatsComponent-StatisticsSupported]. What do you think? * Add stats for {{SortedDocValues}}. This should be fairly straightforward by comparing the {{BytesRef}} of all matching documents. But I don't think we should have a {{mean}} stat for it? Likewise for {{SortedSetDocValues}}. * What should we do with {{SortedNumericDocValues}}? {{min}} and {{max}} are well defined, but what about {{mean}}? Should it be across all values? I intend to close this issue and handle the rest in follow-on issues, unless you think otherwise. Also, would appreciate your feedback on the above points.
23. Patch adds {{sum}}, {{stdev}} and {{variance}} stats to {{NumericDocValuesStats}}. I also added a CHANGES entry which I forgot to in the previous commit.
24. Commit 295cab7216ca76debaf4d354409741058a8641a1 in lucene-solr's branch refs/heads/master from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=295cab7] LUCENE-7590: add sum, variance and stdev stats to NumericDVStats
25. Commit 2a0814fc34b76d8031938d09e11bedc7f604f543 in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=2a0814f] LUCENE-7590: add sum, variance and stdev stats to NumericDVStats
26. Patch adds DVStats for {{SortedNumericDocValuesField}}.
27. Commit 944b8e07f557b9320895998fe33d71cae5199eee in lucene-solr's branch refs/heads/master from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=944b8e0] LUCENE-7590: add DocValuesStats for SortedNumeric DV fields
28. Commit 63a5cd00173f7e89a478981429d4d5cd38f3cf1d in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=63a5cd0] LUCENE-7590: add DocValuesStats for SortedNumeric DV fields
29. Patch adds {{SortedDocValuesStats}} and {{SortedSetDocValuesStats}} for sorted and sorted-set DV fields. With this patch, I think the issue is ready to be closed. I am not sure that we need a DVStats for a BinaryDVField at this point, but if demand arises, it should be easy to add.
30. Commit 23206caabd09310cb23a2b5302ce41af62b5c9cc in lucene-solr's branch refs/heads/master from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=23206ca] LUCENE-7590: add Sorted(Set)DocValuesStats
31. Commit 47bb32c3bb77a2dfaaf9d1db50e244599cf053a6 in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=47bb32c] LUCENE-7590: add Sorted(Set)DocValuesStats
32. Commit 73b6a29f2d89e2f1ce86b57ad0acec7d157f7e21 in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=73b6a29] LUCENE-7590: move docsWithField to DocValuesStats
33. Committed to master and 6x. This is now complete.
34. Commit 321c6f090f04463a8798d090e5426efeabbdc418 in lucene-solr's branch refs/heads/master from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=321c6f0] LUCENE-7590: make (Sorted)NumericDocValuesStats public
35. Commit f075a673c9629e92c1e9dd1e104a4e602d6fe610 in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=f075a67] LUCENE-7590: make (Sorted)NumericDocValuesStats public
36. Commit 944b8e07f557b9320895998fe33d71cae5199eee in lucene-solr's branch refs/heads/feature/metrics from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=944b8e0] LUCENE-7590: add DocValuesStats for SortedNumeric DV fields

37. Commit 23206caabd09310cb23a2b5302ce41af62b5c9cc in lucene-solr's branch refs/heads/feature/metrics from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=23206ca] LUCENE-7590: add Sorted(Set)DocValuesStats
38. Commit 321c6f090f04463a8798d090e5426efeabbdc418 in lucene-solr's branch refs/heads/feature/metrics from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=321c6f0] LUCENE-7590: make (Sorted)NumericDocValuesStats public
39. Commit c083e81e6015d8d52ccd74ad1e966862936fb926 in lucene-solr's branch refs/heads/branch_6x from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=c083e81] LUCENE-7590: fix test edge case In case all indexed documents were deleted, the test failed to correctly assert the number of expected missing documents.
40. Commit 4d81eee8a141c68b17c2f75cf6534fb352d94473 in lucene-solr's branch refs/heads/master from [~shaie] [https://git-wip-us.apache.org/repos/asf?p=lucene-solr.git;h=4d81eee] LUCENE-7590: fix test edge case In case all indexed documents were deleted, the test failed to correctly assert the number of expected missing documents.
41. **body:** [~shaie] I'm a little confused about the description defined here. {code} public LongDocValuesStats(String description) { super(description, Long.MAX_VALUE, Long.MIN_VALUE); } {code} it was in turn passed to NumericDocValueStats as the name of DV field. Why not use the {{field}} as the name of parameter in LongDocValuesStats?
    label: code-design
42. [~shia] where do you see that? I checked master and there's no {{description}} in the file at all. Here's the code: {code} public LongDocValuesStats(String field) { super(field, Long.MAX_VALUE, Long.MIN_VALUE); } {code}