

# SpotBugs Report

## Project Information

Project:

SpotBugs version: 3.1.10

Code analyzed:

- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/TestDataProviders.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/AsciiFeatureCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/AbstractFeatureReaderTest\$SkippingByteChannel.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/bed/BEDCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/util/ftp/FTPUtilsTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/util/ftp/FTPClientTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/util/ParsingUtilsTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/util/popgen/HardyWeinbergCalculationTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/AsciiFeatureCodecTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/AbstractFeatureReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/TribbleTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/AbstractFeatureReaderTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/annotation/StrandTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/AbstractFeatureReaderTest\$VcfRedirectCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/index/tabix/TabixIndexTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/index/IndexTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/index/interval/IntervalTreeTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/index/linear/LinearIndexTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/index/IndexTest\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/index/IndexFactoryTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/index/IndexTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/readers/PositionalBufferedStreamTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/readers/LongLineBufferedReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/readers/BlockCompressedAsciiLineReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/readers/ReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/readers/TabixReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/readers/AsciiLineReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/readers/SynchronousLineReaderUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/BinaryFeaturesTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/TribbleIndexFeatureReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/FeatureReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/tribble/TestUtils.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/utils/TestNGUtilsTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/utils/TestNGUtils.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/utils/ClassFinderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/VariantBaseTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2EncoderDecoderUnitTest\$EncodeMe.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2UtilsUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2EncoderDecoderUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2EncoderDecoderUnitTest\$3.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2EncoderDecoderUnitTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2EncoderDecoderUnitTest\$BCF2TypedValue.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2UtilsUnitTest\$HeaderOrderTestCase.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2EncoderDecoderUnitTest\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2WriterUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/bcf2/BCF2EncoderDecoderUnitTest\$4.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/utils/SAMSequenceDictionaryExtractorTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/utils/VCFHeaderReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/PrintVariantsExampleTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFHeaderUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFStandardHeaderLinesUnitTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/IndexFactoryUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/AbstractVCFCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFHeaderLineUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFIteratorTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFHeaderLineTranslatorUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFStandardHeaderLinesUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFStandardHeaderLinesUnitTest\$RepairHeaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFFileReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFEncoderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/vcf/VCFCompoundHeaderLineUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/GenotypesContextUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/GenotypesContextUnitTest\$lazyMaker.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextUnitTest\$SubContextTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextTestProvider\$VariantContextIOTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextTestProvider\$VariantContextContainer.class

- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextUnitTest\$GetAllelesTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/GenotypesContextUnitTest\$ContextMaker.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextBuilderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextUnitTest\$SitesAndGenotypesVC.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/GenotypeLikelihoodsUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/GenotypeUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantJEXLContextUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/GenotypesContextUnitTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextUnitTest\$SampleNamesTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextTestProvider\$VariantContextTestData.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/GenotypeBuilderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/AlleleUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextTestProvider.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/writer/TabixOnTheFlyIndexCreationTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/writer/VariantContextWritersUnitTest\$BCFIOTester.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/writer/AsyncVariantContextWriterUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/writer/VariantContextWritersUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/writer/VariantContextWritersUnitTest\$VCFIOTester.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/writer/VCFWriterUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/writer/VariantContextWriterBuilderUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/writer/VariantContextWritersUnitTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextTestProvider\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/PassingVariantFilterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/HeterozygosityFilterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/SnpFilterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/AllFailFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/JavascriptVariantFilterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/GenotypeQualityFilterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/AllPassFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/FilteringVariantContextIteratorTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/filter/CompoundFilterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextTestProvider\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/GenotypesContextUnitTest\$GenotypesContextProvider.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextUnitTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/variant/variantcontext/VariantContextTestProvider\$VCIterable.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/HtsjdkTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/ValidateSamFileTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/SamFileHeaderMergerTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/CRAMFileWriterWithIndexTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/SequenceNameTruncationAndValidationTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/CRAMSliceMD5Test\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/CRAIEntryTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/lossy/QualityScorePreservationTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/ref/EnaRefServiceTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/ref/ReferenceSourceTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/CRAIIIndexTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/LosslessRoundTripTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/io/IOTestCases.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/io/InputStreamUtilsTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/io/ITF8Test.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/io/LTF8Test.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/io/CramIntTest.class
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- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/DataSeriesWriterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/CramRecordTestHelper.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/ByteArrayLenCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/core/HuffmanTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/core/SubexponentialIntegerCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/core/GammaIntegerCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/core/BetaIntegerEncodingTest.class
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- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/core/GammaIntegerEncodingTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/CramRecordWriterReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/DataSeriesReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/ReadFeaturesTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/MultiRefSliceAlignmentSpanReaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/external/ExternalIntegerCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/external/ExternalLongCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/external/ExternalByteCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/external/ByteArrayStopCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/external/ByteArrayStopEncodingTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/external/ExternalEncodingTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/external/ExternalByteArrayCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/encoding/ByteArrayLenEncodingTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/compression/ExternalCompressionTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/compression/rans/RansTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/build/CompressionHeaderFactoryTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/build/ContainerFactoryTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/build/CramIOTest.class

- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/build/ContainerParserTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/build/Sam2CramRecordFactoryTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/build/CompressionHeaderFactoryTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/structure/SubstitutionMatrixTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/structure/SliceTests.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/structure/CramCompressionRecordTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/structure/ReadTagTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/structure/BlockTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/structure/ReadTagTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/structure/DataSeriesTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/cram/VersionTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/AbstractBAMFileIndexTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/BAMCigarOverflowTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/BAMIndexValidatorTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/SAMUtilsTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/MetricBaseTest\$B.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/MetricsFileTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/MetricBaseTest\$A.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/VersionHeaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/MetricsFileTest\$TestMetric.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/MetricsFileTest\$FloatingPointMetric.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/StringHeaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/MetricsFileTest\$TestEnum.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/MetricBaseTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/metrics/MetricBaseTest\$TestMetric.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/CRAMContainerStreamWriterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/CRAMFileWriterWithIndexTest\$TabuError.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/MergingSamRecordIteratorGroupCollisionTest\$ProgramGroupAdapter.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/TextTagCodecTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/DuplicateScoringStrategyTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/BAMIndexWriterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/SAMRecordQueryNameComparatorTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/BinTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/SAMFileHeaderTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/MergingSamRecordIteratorTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/SAMBinaryTagAndValueUnitTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/ValidateSamFileTest\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/SamReaderFactoryTest\$TestReaderFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/SamIndexesTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/CRAMSliceMD5Test.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/BAMRemoteFileTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/CRAMTestUtils.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/BAMQueryMultipleIntervalsIteratorFilterTest.class
- /Users/tom/workspace/htsjdk/build/classes/java/test/htsjdk/samtools/BAMFileIndexTest.class
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# Metrics

25815 lines of code analyzed, in 384 classes, in 40 packages.

Metric	Total	Density*
High Priority Warnings	135	5.23
Medium Priority Warnings		0.00
<b>Total Warnings</b>	<b>135</b>	<b>5.23</b>

(\* Defects per Thousand lines of non-commenting source statements)

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## Summary

Warning Type	Number
<a href="#">Bad practice Warnings</a>	4
<a href="#">Correctness Warnings</a>	10
<a href="#">Internationalization Warnings</a>	107
<a href="#">Malicious code vulnerability Warnings</a>	3
<a href="#">Dodgy code Warnings</a>	11
<b>Total</b>	<b>135</b>

## Warnings

Click on a warning row to see full context information.

### Bad practice Warnings

#### Code Warning

- DMI** Random object created and used only once in htsjdk.samtools.seekablestream.SeekableStreamTest.getRandomSeekableStream(int)  
**DMI** Random object created and used only once in htsjdk.samtools.util.CoordSpanInputSteamTest.test\_3\_ranges\_byte\_single\_read()  
**DMI** Random object created and used only once in htsjdk.samtools.util.CoordSpanInputSteamTest.test\_first\_3\_bytes()  
**DMI** Random object created and used only once in htsjdk.samtools.util.CoordSpanInputSteamTest.test\_range\_read()

### Correctness Warnings

#### Code Warning

- GC** VCFContigHeaderLine is incompatible with expected argument type VCFFilterHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddContigLine()  
**GC** VCFContigHeaderLine is incompatible with expected argument type VCFFormatHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddContigLine()  
**GC** VCFContigHeaderLine is incompatible with expected argument type VCFInfoHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddContigLine()  
**GC** VCFFilterHeaderLine is incompatible with expected argument type VCFContigHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddFilterLine()  
**GC** VCFFilterHeaderLine is incompatible with expected argument type VCFFormatHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddFilterLine()  
**GC** VCFFilterHeaderLine is incompatible with expected argument type VCFInfoHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddFilterLine()  
**GC** VCFFormatHeaderLine is incompatible with expected argument type VCFContigHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddFormatLine()  
**GC** VCFFormatHeaderLine is incompatible with expected argument type VCFFilterHeaderLine in

htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddFormatLine()

**GC** VCFInfoHeaderLine is incompatible with expected argument type VCFCContigHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddInfoLine()

**GC** VCFInfoHeaderLine is incompatible with expected argument type VCFFilterHeaderLine in  
htsjdk.variant.vcf.VCFHeaderUnitTest.testVCFHeaderAddInfoLine()

## Internationalization Warnings

### Code Warning

- Dm** Found reliance on default encoding in htsjdk.samtools.BAMFileWriterTest.testBAMReadBases(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.BAMFileWriterTest.testHelper(SAMRecordSetBuilder, SAMFileHeader\$SortOrder, boolean): new java.io.FileReader(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.BAMFileWriterTest.testHelper(SAMRecordSetBuilder, SAMFileHeader\$SortOrder, boolean): new java.io.PrintWriter(OutputStream)
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.CompressionHeaderFactoryTest.testGetDataForTag(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.CompressionHeaderFactoryTest.test\_getByteSizeRangeOfTagValues(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.CompressionHeaderFactoryTest.test\_getBestExternalCompressor(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.CompressionHeaderFactoryTest.test\_getTagType(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.ContainerFactoryTest.testMapped(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.ContainerFactoryTest.testMultiref(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.ContainerFactoryTest.testUnmapped(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.ContainerParserTest.testMappedAndUnmappedContainer(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.ContainerParserTest.testMultirefContainer(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.ContainerParserTest.testSingleRefContainer(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.ContainerParserTest.testUnmappedContainer(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.Sam2CramRecordFactoryTest.buildMatchOrMismatchReadFeatures(String, String, String): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.Sam2CramRecordFactoryTest.testReadBaseNormalization(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.compression.ExternalCompressionTest.<static initializer for ExternalCompressionTest>(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.compression.ExternalCompressionTest.testBZip2Decompression(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.encoding.CramRecordTestHelper.createRecords(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.encoding.MultiRefSliceAlignmentSpanReaderTest.initSpanRecords(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.LosslessRoundTripTest.test\_MD\_NM(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.lossy.QualityScorePreservationTest.buildSAMRecord(String, String): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.ref.ReferenceSourceTest.testReferenceSourceUpperCasesBases(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.BlockTest.rtProvider(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.BlockTest.testExternalBlockRoundTrips(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.BlockTest.uncompressedTest(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.CramCompressionRecordTest.test\_getAlignmentEnd(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.ReadTagTest.test(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.SliceTests.test\_validateRef(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.VersionTest.test\_V3(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.CRAMBAIIndexerTest.createRecord(int, int, int): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.CRAMCRAIIIndexerTest.createSAMRecord(SAMFileHeader, int, int, int): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.CRAMEdgeCasesTest.testNullsAndBeyondRef(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.CRAMFileWriterWithIndexTest.addRandomSequence(SAMFileHeader, int, InMemoryReferenceSequenceFile): String.getBytes()
- Dm** Found reliance on default encoding in new htsjdk.samtools.CRAMSliceMD5Test\$CramTestCase(): new String(byte[])
- Dm** Found reliance on default encoding in new htsjdk.samtools.CRAMSliceMD5Test\$CramTestCase(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.liftover.LiftOverTest.testWriteChain(): new java.io.PrintWriter(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.metrics.MetricsFileTest.writeThenReadBack(MetricsFile): new java.io.FileReader(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.metrics.MetricsFileTest.writeThenReadBack(MetricsFile): new java.io.FileWriter(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.reference.FastaSequenceFileTest.testIntermediateWhitespace(): new java.io.PrintWriter(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.reference.FastaSequenceFileTest.testStream(): new java.io.PrintWriter(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.reference.FastaSequenceFileTest.testTrailingWhitespace(): new java.io.PrintWriter(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.reference.ReferenceSequenceTests.<static initializer for ReferenceSequenceTests>(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.reference.ReferenceSequenceTests.makeRandomReference(int, int): new java.io.FileWriter(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.SamFileHeaderMergerTest.testProgramGroupAndReadGroupMerge(File[], File): new java.io.FileReader(File)
- Dm** Found reliance on default encoding in htsjdk.samtools.SAMFileWriterFactoryTest.inMemorySam(): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.SAMIntegerTagTest.createSamForIntAttr(long): new java.io.PrintStream(OutputStream)
- Dm** Found reliance on default encoding in htsjdk.samtools.SAMIntegerTagTest.testRoundtripIntegerAttribute(Number, SAMIntegerTagTest\$FORMAT, ValidationStringency): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.SamReaderFactoryTest.addHeader(SeekableByteChannel): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.SAMTextReaderTest.createSamFileReader(String): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.SAMUtilsTest.testClippingOfRecordWithDeletion(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.SAMUtilsTest.testClippingOfRecordWithInsertion(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.SAMUtilsTest.testClippingOfRecordWithMateAtSamePosition(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.SAMUtilsTest.testClippingOfRecordWithSoftClipBasesAtTheEnd(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.SAMUtilsTest.testCompressedBasesToBytes(): new String(byte[])

Dm Found reliance on default encoding in htsjdk.samtools.SAMUtilsTest.testOtherCanonicalAlignments(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.SAMUtilsTest.testSimpleClippingOfRecord(): String.getBytes()

Dm Found reliance on default encoding in new htsjdk.samtools.seekablestream.ByteArraySeekableStreamTest(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.seekablestream.SeekableFTPStreamTest.<static initializer for SeekableFTPStreamTest>(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.seekablestream.SeekableMemoryStreamTest.test\_getSource(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.seekablestream.SeekableMemoryStreamTest.test\_reset(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.sra.SRAReferenceTest.testReference(String, String, int, int, String): new String(byte[])

Dm Found reliance on default encoding in htsjdk.samtools.sra.SRAReferenceTest\$1.run(): new String(byte[])

Dm Found reliance on default encoding in htsjdk.samtools.sra.SRATest.checkSAMRecord(SAMRecord, int, String, String, String, int, String, String, int, boolean, boolean, boolean): new String(byte[])

Dm Found reliance on default encoding in htsjdk.samtools.sra.SRATest.testRowsOverrideValues(String, int, int, String, String, String, int, String, String, int, boolean, boolean, boolean): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedInputStreamTest.testCustomInflater(BlockCompressedInputStreamTest\$CheckedExceptionInputStreamSupplier, List, int, InflaterFactory): new java.io.InputStreamReader(InputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedInputStreamTest.writeTempBlockCompressedFileForInflaterTest(File): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedOutputStreamTest.testBasic(): new java.io.InputStreamReader(InputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedOutputStreamTest.testBasic(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedOutputStreamTest.testCustomDeflater(): new java.io.InputStreamReader(InputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedOutputStreamTest.testCustomDeflater(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedOutputStreamTest.testDevNull(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedOutputStreamTest.testSeekReadExceptions(String, Class, String, boolean, boolean, boolean, int): new java.io.InputStreamReader(InputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedTerminatorTest.getValidCompressedFile(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.EdgeReadIteratorTest.createIntervalList(String): new java.io.InputStreamReader(InputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.EdgeReadIteratorTest.createIntervalList(String): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.IOUtilTest.gzipTests(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.IOUtilTest.testFileReadingAndWriting(): new java.io.InputStreamReader(InputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.IOUtilTest.testFileReadingAndWriting(): new java.io.OutputStreamWriter(OutputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.LogTest.testLogToFile(): new java.io.PrintStream(OutputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.SequenceUtilTest.testIUPAC\_CODES\_STRING(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.SequenceUtilTest.testToBamReadBases(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.util.SnappyLoaderUnitTest.testCanLoadAndRoundTripWithSnappy(): new java.io.OutputStreamWriter(OutputStream)

Dm Found reliance on default encoding in htsjdk.samtools.util.SortingCollectionTest\$StringCodec.decode(): new String(byte[])

Dm Found reliance on default encoding in htsjdk.samtools.util.SortingCollectionTest\$StringCodec.encode(String): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.ValidateSamFileTest.executeValidationWithErrorIgnoring(SamReader, ReferenceSequenceFile, BamIndexValidator\$IndexValidationStringency, Collection, boolean): new java.io.FileReader(File)

Dm Found reliance on default encoding in htsjdk.samtools.ValidateSamFileTest.executeValidationWithErrorIgnoring(SamReader, ReferenceSequenceFile, BamIndexValidator\$IndexValidationStringency, Collection, boolean): new java.io.PrintWriter(File)

Dm Found reliance on default encoding in htsjdk.samtools.ValidateSamFileTest.tagCorrectlyProcessData(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.samtools.ValidateSamFileTest.testHeaderVersion(String, boolean): new java.io.PrintWriter(File)

Dm Found reliance on default encoding in htsjdk.samtools.ValidateSamFileTest.validateBamFileTerminationTest(File, SAMValidationError\$type, int, int): new java.io.PrintWriter(OutputStream)

Dm Found reliance on default encoding in htsjdk.tribble.index.interval.IntervalTreeTest.testBed(): new java.io.FileReader(String)

Dm Found reliance on default encoding in htsjdk.tribble.readers.AsciiLineReaderTest,voidTestLineEndingLength(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.tribble.readers.AsciiLineReaderTest,voidTestLineEndingLengthAtEof(): String.getBytes()

Dm Found reliance on default encoding in htsjdk.tribble.readers.BlockCompressedAsciiLineReaderTest.populateMultiBlockCompressedFile(File): String.getBytes()

Dm Found reliance on default encoding in htsjdk.tribble.readers.LongLineBufferedReaderTest.testReadLines(): new java.io.InputStreamReader(InputStream)

Dm Found reliance on default encoding in htsjdk.tribble.readers.ReaderTest.testLineReader(String): String.getBytes()

Dm Found reliance on default encoding in htsjdk.tribble.readers.ReaderTest.testStream(String): String.getBytes()

Dm Found reliance on default encoding in htsjdk.tribble.readers.SynchronousLineReaderUnitTest.testLineReaderIterator\_readerConstructor(): new java.io.InputStreamReader(InputStream)

Dm Found reliance on default encoding in htsjdk.tribble.readers.SynchronousLineReaderUnitTest.testLineReaderIterator\_streamConstructor(): new

	java.io.InputStreamReader(InputStream)
Dm	Found reliance on default encoding in htsjdk.tribble.util.ftp.FTPClientTest.<static initializer for FTPClientTest>(): String.getBytes()
Dm	Found reliance on default encoding in htsjdk.tribble.util.ParsingUtilsTest.testFileOpenInputStream(): new java.io.OutputStreamWriter(OutputStream)
Dm	Found reliance on default encoding in htsjdk.variant.variantcontext.AlleleUnitTest.testConstructors1(): String.getBytes()
Dm	Found reliance on default encoding in htsjdk.variant.variantcontext.AlleleUnitTest.testCreatingIndelAlleles(): String.getBytes()
Dm	Found reliance on default encoding in htsjdk.variant.variantcontext.AlleleUnitTest.testExtend(): String.getBytes()
Dm	Found reliance on default encoding in htsjdk.variant.variantcontext.AlleleUnitTest.testInsConstructors(): String.getBytes()
	Found reliance on default encoding in htsjdk.variant.variantcontext.writer.VariantContextWriterBuilderUnitTest.lambda\$demonstrateTestWriteToPipeDoesNotHang_2\$1(String): String.getBytes()
Dm	Found reliance on default encoding in htsjdk.variant.vcf.VCFHeaderUnitTest.checkMD5ofHeaderFile(VCFHeader, String): new java.io.PrintWriter(File)

## Malicious code vulnerability Warnings

Code	Warning
MS	htsjdk.tribble.TestTools.DATA_DIR isn't final but should be
MS	htsjdk.variant.vcf.VCFHeaderUnitTest.VCF4headerStrings isn't final but should be
MS	htsjdk.variant.vcf.VCFHeaderUnitTest.VCF4headerStrings_with_negativeOne isn't final but should be

## Dodgy code Warnings

Code Warning
DLS Dead store to source in htsjdk.samtools.cram.build.ContainerFactoryTest.testMapped()
DLS Dead store to shouldThrow in htsjdk.samtools.reference.SamLocusAndReferenceIteratorTest.testSamLocusAndReferenceIteratorMismatch()
DLS Dead store to resource in htsjdk.samtools.SamReaderFactoryTest.queryStreamingPathBamWithFileIndex()
DLS Dead store to linesWritten in htsjdk.samtools.util.BlockCompressedOutputStreamTest.testOverflow()
DLS Dead store to element in htsjdk.samtools.util.CigarElementUnitTest.testNegativeLengthCheck()
DLS Dead store to encoder in htsjdk.variant.bcf2.BCF2EncoderDecoderUnitTest.determineBestEncoding(List, BCF2Type)
DLS Dead store to headerline in htsjdk.variant.vcf.VCFCompoundHeaderLineUnitTest.supportsVersionFields()
ST Write to static field htsjdk.samtools.CSIIIndexTest.bai from instance method htsjdk.samtools.CSIIIndexTest.init()
ST Write to static field htsjdk.samtools.CSIIIndexTest.csi from instance method htsjdk.samtools.CSIIIndexTest.init()
ST Write to static field htsjdk.samtools.CSIIIndexTest.mcsi from instance method htsjdk.samtools.CSIIIndexTest.init()
Write to static field htsjdk.samtools.util.BlockCompressedInputStreamTest\$CountingInflater.inflateCalls from instance method
ST htsjdk.samtools.util.BlockCompressedInputStreamTest.testCustomInflater(BlockCompressedInputStreamTest\$CheckedExceptionInputStreamSupplier, List, int, InflaterFactory)

## Details

### DLS\_DEAD\_LOCAL\_STORE: Dead store to local variable

This instruction assigns a value to a local variable, but the value is not read or used in any subsequent instruction. Often, this indicates an error, because the value computed is never used.

Note that Sun's javac compiler often generates dead stores for final local variables. Because SpotBugs is a bytecode-based tool, there is no easy way to eliminate these false positives.

### DM\_DEFAULT\_ENCODING: Reliance on default encoding

Found a call to a method which will perform a byte to String (or String to byte) conversion, and will assume that the default platform encoding is suitable. This will cause the application behaviour to vary between platforms. Use an alternative API and specify a charset name or Charset object explicitly.

### DMI\_RANDOM\_USED\_ONLY\_ONCE: Random object created and used only once

This code creates a java.util.Random object, uses it to generate one random number, and then discards the Random object. This produces mediocre quality random numbers and is inefficient. If possible, rewrite the code so that the Random object is created once and saved, and each time a new random number is required invoke a method on the existing Random object to obtain it.

If it is important that the generated Random numbers not be guessable, you *must* not create a new Random for each random number; the values are too easily guessable. You should strongly consider using a java.security.SecureRandom instead (and avoid allocating a new SecureRandom for each random number needed).

### GC\_UNRELATED\_TYPES: No relationship between generic parameter and method argument

This call to a generic collection method contains an argument with an incompatible class from that of the collection's parameter (i.e., the type of the argument is neither a supertype nor a subtype of the corresponding generic type argument). Therefore, it is unlikely that the collection contains any objects that are equal to the method argument used here. Most likely, the wrong value is being passed to the method.

In general, instances of two unrelated classes are not equal. For example, if the `Foo` and `Bar` classes are not related by subtyping, then an instance of `Foo`

should not be equal to an instance of `Bar`. Among other issues, doing so will likely result in an equals method that is not symmetrical. For example, if you define the `Foo` class so that a `Foo` can be equal to a `String`, your equals method isn't symmetrical since a `String` can only be equal to a `String`.

In rare cases, people do define nonsymmetrical equals methods and still manage to make their code work. Although none of the APIs document or guarantee it, it is typically the case that if you check if a `Collection<String>` contains a `Foo`, the equals method of argument (e.g., the equals method of the `Foo` class) used to perform the equality checks.

## **MS\_SHOULD\_BE\_FINAL: Field isn't final but should be**

This static field public but not final, and could be changed by malicious code or by accident from another package. The field could be made final to avoid this vulnerability.

## **ST\_WRITE\_TO\_STATIC\_FROM\_INSTANCE\_METHOD: Write to static field from instance method**

This instance method writes to a static field. This is tricky to get correct if multiple instances are being manipulated, and generally bad practice.