

# SpotBugs Report

## Project Information

Project:

SpotBugs version: 3.1.10

Code analyzed:

- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleException\$CorruptedIndexFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/SimpleFeature.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/bed/FullBEDFeature.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/bed/SimpleBEDFeature.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/bed/BEDFeature.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/bed/FullBEDFeature\$Exon2.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/bed/FullBEDFeature\$Exon.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/bed/BEDCodec\$StartOffset.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/bed/BEDCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleException\$UnableToReadIndexFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/CloseableTribbleIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/AbstractFeatureReader\$EmptyIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/ParsingUtils.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/HTTPHelper\$WrapperInputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/TabixUtils\$TIntv.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/MathUtils.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/URLHelper.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/TabixUtils\$TPair64.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/LittleEndianInputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/TabixUtils\$TIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/FTPHelper.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/HTTPHelper.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/LittleEndianOutputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/TabixUtils.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/RemoteURLHelper.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/MathUtils\$RunningStat.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/util/popgen/HardyWeinbergCalculation.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/AbstractFeatureCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleIndexedFeatureReader\$WFIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/Feature.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/BinaryFeatureCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/example/IndexToTable.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/example/IndicesAreEqual.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/example/CountRecords.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/example/ExampleBinaryCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/example/ProfileIndexReading.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/FeatureCodecHeader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleException\$FeatureFileDoesntExist.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/annotation/Strand.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/AsciiFeatureCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/FeatureReader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleIndexedFeatureReader\$BlockStreamWrapper.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/Tribble.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/AbstractFeatureReader\$ComponentMethods.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/NameAwareCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleIndexedFeatureReader\$QueryIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleException\$InternalCodecException.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleException\$InvalidDecodeLine.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TribbleException\$TabixReaderFailure.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TabixFeatureReader\$FeatureIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/TabixFeatureReader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/FeatureCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/tabix/TabixIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/tabix/TabixIndexCreator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/tabix/TabixFormat.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/tabix/TabixIndexCreator\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/tabix/TabixIndexCreator\$TabixFeature.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/ChrIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/Index.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/AbstractIndex\$IndexType.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/DynamicIndexCreator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/IndexFactory\$IndexBalanceApproach.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/IndexFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/Block.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/interval/IntervalTree\$Node.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/interval/IntervalTreeIndex\$ChrIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/interval/IntervalTreeIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/interval/Interval.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/interval/IntervalTreeIndex\$ChrIndex\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/interval/MutableInterval.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/interval/IntervalIndexCreator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/interval/IntervalTree.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/tribble/index/linear/LinearIndex\$ChrIndex.class







- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/writer/GenotypesWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/writer/BCF2FieldEncoder\$Flag.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/writer/VariantContextWriterBuilder\$OutputType.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/writer/AsyncVariantContextWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/writer/VariantContextWriterBuilder.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/GenotypeLikelihoods.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/LazyGenotypesContext.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/filter/VariantContextFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/filter/FilteringIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/filter/SnpFilter.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/VariantContext\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/GenotypeType.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/JEXLMap.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/GenotypeJEXLContext.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/variant/variantcontext/Allele.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SecondaryOrSupplementarySkippingIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMFormatException.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMSequenceRecord.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMQueryMultipleIntervalsIteratorFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMFileReader\$BAMFileIndexUnmappedIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/BaseCategory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/QualityScoreTreatmentType.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/Binning.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/BaseCategoryType.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/PreservationPolicy.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/ReadCategory.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/QualityScorePreservation\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/ReadCategoryType.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/QualityScorePreservation\$3.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/QualityScorePreservation.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/lossy/QualityScorePreservation\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/ref/InMemoryReferenceSequenceFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/ref/ReferenceSource.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/ref/EnaRefService.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/ref/EnaRefService\$GaveUpException.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/ref/CRAMReferenceSource.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/ref/ReferenceRegion.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/ref/ReferenceTracks.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/CRAIIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/SERIES\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$Digester.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/SERIES\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/AbstractSerialDigest.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/SERIES.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$KNOWN\_DIGESTS\$6.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$KNOWN\_DIGESTS.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/Crc32Hasher.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/MessageDigestHasher.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$KNOWN\_DIGESTS\$4.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$KNOWN\_DIGESTS\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$KNOWN\_DIGESTS\$5.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/Combine.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/IntegerSumCombine.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ByteSumCombine.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$KNOWN\_DIGESTS\$3.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/digest/ContentDigests\$KNOWN\_DIGESTS\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/BitInputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/CRC32OutputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/CramIntArray.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/ITF8.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/BitOutputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/DefaultBitInputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/CountingInputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/CramInt.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/ExposedByteArrayOutputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/DefaultBitOutputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/InputStreamUtils.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/CRC32InputStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/io/LTF8.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/encoding/reader/CramRecordReader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/encoding/reader/MultiRefSliceAlignmentSpanReader.class





- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/Decoding\$AriDecoder.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/RANS\$ORDER.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/Encoding\$RansEncSymbol.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/D04.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/Frequencies.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/Decoding\$FC.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/RANS\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/Decoding.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/E14.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/Utils.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/rans/D14.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/ExternalCompressor\$5.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/compression/ExternalCompression.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/CRAIEntry\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/CRAMException.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/CompressionHeaderFactory\$EncodingDetails.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/ContainerFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/ContainerParser.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/Sam2CramRecordFactory\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/CramNormalizer.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/CompressionHeaderFactory\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/CramSpanContainerIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/Sam2CramRecordFactory.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/CompressionHeaderFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/CramSpanContainerIterator\$Boundary.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/CompressionHeaderFactory\$CompressionHeaderBuilder.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/Cram2SamRecordFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/build/CramIO.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/structure/SliceIO\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/structure/ContainerIO.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/structure/CompressionHeader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/structure/EncodingID.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/cram/structure/SliceIO.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/BlockCompressedInputStream.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/QualityEncodingDetector\$1.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/Lazy\$LazyInitializer.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/EdgingRecordAndOffset\$Type.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/GZIIndex\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/IntervalTree\$OverlapIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/SequenceUtil\$SequenceListsDifferException.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/Locus.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/SamRecordIntervalIteratorFactory\$StopAfterFilteringIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/nio/DeleteOnExitPathHook.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/AbstractProgressLogger.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/SamRecordTrackingBuffer.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/ProgressLoggerInterface.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/CollectionUtil\$DefaultingMap\$Factory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/AbstractLocusIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/SortingLongCollection\$FileValueIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/IterableOnceIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/LocusComparator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/QualityEncodingDetector.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/TempStreamFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/DiskBackedQueue.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/Tuple.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/AbstractAsyncWriter\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/IntervalListReferenceSequenceMask.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/IntervalTree.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/BlockCompressedInputStream\$FileTermination.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/AbstractAsyncWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/BlockGunzipper.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/EdgingRecordAndOffset\$StartEdgingRecordAndOffset.class



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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/CollectionUtil\$DefaultingMap.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/util/AbstractAsyncWriter\$WriterRunnable.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CoordinateSortedPairInfoMap\$MapIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SQTagUtil\$SQBase.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CRAMFileReader\$CRAMIntervalIterator.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileHeaderMerger\$HeaderRecordFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFlagField\$4.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileHeaderMerger\$3.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/TextualBAMIndexWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/PathInputResource.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CRAMFileReader\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileHeaderMerger.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/liftover/LiftOver\$PartialLiftOver.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/liftover/Chain.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/liftover/Chain\$ContinuousBlock.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/liftover/LiftOver\$TargetIntersection.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/liftover/Chain\$1.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMRecordQueryHashComparator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMFileReader\$BAMStartingAtIteratorFilter.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/example/PrintReadsExample.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DuplicateScoringStrategy\$Attr.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamPairUtil\$PairOrientation.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DuplicateSetIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/IndexFileBufferFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFlagField\$3.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFlagField\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DuplicateScoringStrategy\$ScoringStrategy.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMRecordDuplicateComparator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/HighAccuracyDownsamplingIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMRecord\$SAMTagAndValue.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileValidator\$InMemoryPairEndInfoMap.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CigarOperator\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/AsyncSAMFileWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SBIIndex\$Header.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BinList\$BinIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CustomReaderFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMFileHeader\$GroupOrder.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BinningIndexBuilder\$FeatureToBeIndexed.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BinaryTagCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/sra/SRAAccession.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/sra/SRALazyRecord\$LazyField\$8.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/sra/SRAUnalignmentIterator.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/sra/SRALazyRecord\$LazyField\$7.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/sra/SRALazyRecord\$LazyFlag\$2.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/sra/SRAAlignmentIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/sra/SRALazyRecord\$LazyAttribute\$1.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/sra/SRALazyRecord\$LazyFlag\$6.class

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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMTextReader\$1.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileValidator\$MaxOutputExceededException.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/seekablestream/SeekableStreamFactory.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/seekablestream/SeekableFTPStream.class
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- /Users/tom/workspace/htsjdk/build/classes/java/main/ArraySeekableStream/ByteArraySeekableStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/seekablestream/SeekableStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/seekablestream/SeekableBufferedStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/seekablestream/SeekableFileStream.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMSequenceDictionaryCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DuplicateScoringStrategy\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamPairUtil.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileHeaderMerger\$HeaderRecordAndFileHeader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/QueryInterval.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CSIIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMTextHeaderCodec\$ParsedHeaderLine.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SRAFileReader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/Defaults.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/InputResource.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMFileWriterFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMLLineParser.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/MergingSamRecordIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileValidator\$InMemoryPairEndInfoMap\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DuplicateSet.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/MemoryMappedFileBuffer.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileValidator\$PairEndInfo.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DownsamplingIteratorFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/TextTagCodec\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SRAIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMValidationError\$Severity.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMRecordQueryNameComparator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReaderFactory\$Option\$4.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileValidator\$CoordinateSortedPairEndInfoMap\$Codec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReader\$ReaderImplementation.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMFileReader\$AbstractBamIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/InputResource\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SRAInputResource.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/ConstantMemoryDownsamplingIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReader\$Type.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SBIIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMTextWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/TextTagCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMIndexer\$BAMIndexBuilder.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/TagValueAndUnsignedArrayFlag.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMUtils\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DiskBasedBAMFileIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BinaryCigarCodec.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMSortOrderChecker.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReaderFactory\$Option\$3.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMFileHeader\$PgIdGenerator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CRAMContainerStreamWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/MergingSamRecordIterator\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReaderFactory\$Option\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/SecondaryAlignmentFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/FilteringIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/TagFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/SolexaNoiseFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/SamRecordFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/AggregateFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/MappingQualityFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/AlignedFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/IntervalFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/InsertSizeFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/ReadNameFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/DuplicateReadFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/JavascriptSamRecordFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/WholeReadClippedFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/AbstractJavascriptFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/IntervalKeepPairFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/FilteringSamIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/FailsVendorReadQualityFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/NotPrimaryAlignmentFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/OverclippedReadFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/filter/SecondaryOrSupplementaryFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SBIIndexWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMIndexer\$BAMIndexBuilder\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMIndexer.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DownsamplingIteratorFactory\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMFileWriterImpl.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMFileReader\$EmptyBamIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMUtils.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/Cigar.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/Cigar\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/ValidationStringency.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/RandomAccessFileBuffer.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DuplicateScoringStrategy.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMSequenceDictionary.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReaderFactory\$SamReaderFactoryImpl.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BinningIndexContent\$BinList\$BinIterator.class

- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/FastqWriterFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/FastqReader\$LineType.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/FastqRecord.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/AsyncFastqWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/FastqConstants\$FastqExtensions.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/FastqWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/BasicFastqWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/FastqReader.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/FastqEncoder.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/fastq/FastqConstants.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMIteratorFilter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMTextHeaderCodec\$HeaderRecordType.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CRAMCRAIIndexer.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/apps/TimeRandomAccessFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/apps/TimeChannel.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReader\$AssertingIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMIndexContent.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BinningIndexContent\$BinList.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamReaderFactory\$Option\$5.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMFlag.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMTextHeaderCodec\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMIteratorFilter\$IntervalComparison.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/InputStreamInputResource.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMHeaderRecordComparator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamPairUtil\$SetMateInfoIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileValidator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMRecordFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMFileSource.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMRecordSetBuilder\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/ReferenceSequenceFileFactory\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/FastaSequenceIndexCreator\$FaiEntryBuilder.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/ReferenceSequenceFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/ReferenceSequence.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/BlockCompressedIndexedFastaSequenceFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/AbstractFastaSequenceFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/ReferenceSequenceFileFactory.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/FastaSequenceIndexCreator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/SamLocusAndReferenceIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/FastaSequenceIndexEntry.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/SamLocusAndReferenceIterator\$SAMLocusAndReference.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/FastaSequenceFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/FastaSequenceIndexCreator\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/FastaSequenceIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/AbstractIndexedFastaSequenceFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/IndexedFastaSequenceFile.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/reference/ReferenceSequenceFileWalker.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamStreams.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileValidator\$ValidationMetrics.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/AbstractBAMFileIndex.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/ComparableSamRecordIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/CigarElement.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/Chunk.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/UrlInputResource\$1.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMValidationError.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/BAMIndexWriter.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/DownsamplingIterator.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SamFileValidator\$CoordinateSortedPairEndInfoMap.class
- /Users/tom/workspace/htsjdk/build/classes/java/main/htsjdk/samtools/SAMFileSpan.class

## Metrics

45593 lines of code analyzed, in 981 classes, in 53 packages.

Metric	Total	Density*
High Priority Warnings	138	3.03
Medium Priority Warnings		0.00
<b>Total Warnings</b>	<b>138</b>	<b>3.03</b>

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

## Contents

- [Bad practice Warnings](#)
- [Correctness Warnings](#)
- [Internationalization Warnings](#)



- [Malicious code vulnerability Warnings](#)
- [Multithreaded correctness Warnings](#)
- [Performance Warnings](#)
- [Dodgy code Warnings](#)
- [Details](#)

## Summary

Warning Type	Number
<a href="#">Bad practice Warnings</a>	8
<a href="#">Correctness Warnings</a>	5
<a href="#">Internationalization Warnings</a>	84
<a href="#">Malicious code vulnerability Warnings</a>	13
<a href="#">Multithreaded correctness Warnings</a>	1
<a href="#">Performance Warnings</a>	20
<a href="#">Dodgy code Warnings</a>	7
<b>Total</b>	<b>138</b>

## Warnings

Click on a warning row to see full context information.

### Bad practice Warnings

#### Code Warning

- CN** htsjdk.samtools.cram.structure.CramHeader defines clone() but doesn't implement Cloneable
- CN** htsjdk.samtools.SAMFileHeader defines clone() but doesn't implement Cloneable
- HE** htsjdk.samtools.cram.encoding.readfeatures.Substitution defines equals and uses Object.hashCode()
- HE** htsjdk.samtools.cram.structure.CramCompressionRecord defines equals and uses Object.hashCode()
- HE** htsjdk.samtools.reference.FastaSequenceIndex defines equals and uses Object.hashCode()
- HE** htsjdk.variant.variantcontext.GenotypeLikelihoods defines equals and uses Object.hashCode()
- Se** htsjdk.samtools.MergingSamRecordIterator\$MergedSequenceDictionaryCoordinateOrderComparator is serializable but also an inner class of a non-serializable class
- Se** htsjdk.samtools.util.SortingCollection\$PeekFileRecordIteratorComparator is serializable but also an inner class of a non-serializable class

### Correctness Warnings

#### Code Warning

- ICAST** Integral value cast to double and then passed to Math.ceil in htsjdk.samtools.util.AsyncBlockCompressedInputStream.<static initializer for AsyncBlockCompressedInputStream>()
- INT** Bad comparison of nonnegative value with -1 in htsjdk.samtools.cram.compression.rans.E14.compress(ByteBuffer, Encoding\$RansEncSymbol[[[]], ByteBuffer)
- RCN** Nullcheck of content at line 76 of value previously dereferenced in htsjdk.samtools.TextualBAMIndexWriter.writeReference(BAMIndexContent)
- RV** new htsjdk.tribble.TribbleException(String, Throwable) not thrown in htsjdk.tribble.readers.PositionalBufferedStream.close()
- UR** contentId isn't initialized in htsjdk.samtools.cram.structure.block.ExternalBlock.getContentId() when invoked from constructor for superclass

### Internationalization Warnings

#### Code Warning

- Dm** Found reliance on default encoding in htsjdk.samtools.AbstractBAMFileIndex.verifyIndexMagicNumber(String): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.BAMFileConstants.<static initializer for BAMFileConstants>(): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.CramIO.readCramHeader(InputStream): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.build.CramIO.toByteArray(SAMFileHeader): new java.io.OutputStreamWriter(OutputStream)
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.CRAIEntry.writeToStream(OutputStream): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.encoding.readfeatures.Bases.toString(): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.encoding.readfeatures.Insertion.toString(): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.encoding.readfeatures.Scores.toString(): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.encoding.readfeatures.SoftClip.toString(): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.CompressionHeader.internalRead(InputStream): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.CompressionHeader.internalWrite(OutputStream): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.CramCompressionRecord.toString(): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.CramHeader.<static initializer for CramHeader>(): String.getBytes()
- Dm** Found reliance on default encoding in new htsjdk.samtools.cram.structure.CramHeader(Version, String, SAMFileHeader): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.CramHeader.setID(String): String.getBytes()
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.ReadTag.intToNameType3Bytes(int): new String(byte[])
- Dm** Found reliance on default encoding in htsjdk.samtools.cram.structure.ReadTag.intToNameType4Bytes(int): new String(byte[])
- Found reliance on default encoding in htsjdk.samtools.cram.structure.Slice.getBrief(int, int, byte[], int): new String(byte[])

<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.cram.structure.Slice.setRefMD5(byte[]): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.cram.structure.SubstitutionMatrix.toString(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.CRAMContainerStreamWriter.flushContainer(): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.CRAMContainerStreamWriter.flushContainer(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.CRAMCRAIIndexer.readIndex(InputStream): new java.util.Scanner(InputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.CSIIndex.verifyIndexMagicNumber(String): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in new htsjdk.samtools.fastq.BasicFastqWriter(File, boolean): new java.io.PrintStream(OutputStream)
<b>Dm</b>	Found reliance on default encoding in new htsjdk.samtools.filter.AbstractJavascriptFilter(File, Object): new java.io.FileReader(File)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.metrics.MetricsFile.areMetricsAndHistogramsEqual(File, File): new java.io.FileReader(File)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.metrics.MetricsFile.areMetricsEqual(File, File): new java.io.FileReader(File)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.metrics.MetricsFile.readHeaders(File): new java.io.FileReader(File)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.metrics.MetricsFile.write(File): new java.io.FileWriter(File)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.reference.FastaSequenceIndex.parseIndexFile(InputStream): new java.util.Scanner(InputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.reference.FastaSequenceIndex.write(Path): new java.io.PrintStream(OutputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.SamIndexes.<static initializer for SamIndexes>(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.SAMSequenceDictionary.md5(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.SBIIndex.<static initializer for SBIIndex>(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.SBIIndex.readHeader(BinaryCodec): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.seekablestream.SeekableFTPStream.main(String[]): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.sra.SRAAccession.isValid(String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.sra.SRAIndexedSequenceFile.getSubsequenceAt(String, long, long): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.sra.SRALazyRecord.getReadBasesImpl(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.TextCigarCodec.<static initializer for TextCigarCodec>(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in new htsjdk.samtools.TextualBAMIndexWriter(int, File): new java.io.PrintWriter(File)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.BlockCompressedInputStream.readLine(): java.io.ByteArrayOutputStream.toString()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.BufferedLineReader.fromString(String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.ftp.FTPClient.connect(String): new java.io.InputStreamReader(InputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.ftp.FTPClient.connect(String): new java.io.PrintStream(OutputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.IOUtil.openFileForBufferedReading(Path): new java.io.InputStreamReader(InputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.IOUtil.openFileForBufferedWriting(File, boolean): new java.io.OutputStreamWriter(OutputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.IOUtil.readFully(InputStream): new java.io.InputStreamReader(InputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.Md5CalculatingInputStream.close(): new java.io.FileWriter(File)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.ProcessExecutor.execute(String[], String): new java.io.OutputStreamWriter(OutputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.ProcessExecutor.interleaveProcessOutput(Process): new java.io.InputStreamReader(InputStream)
<b>Dm</b>	Found reliance on default encoding in new htsjdk.samtools.util.ProcessExecutor\$ProcessOutputReader(InputStream): new java.io.InputStreamReader(InputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.QualityEncodingDetector\$QualityRecordAggregator.add(SAMRecord, boolean): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.QualityEncodingDetector\$QualityRecordAggregator.add(FastqRecord): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.SequenceUtil.<static initializer for SequenceUtil>(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in new htsjdk.samtools.util.SnappyLoader(boolean): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in new htsjdk.samtools.util.StringLineReader(String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.samtools.util.StringUtil.levenshteinDistance(String, String, int, int, int, int): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.tribble.example.IndexToTable.main(String[]): new java.io.PrintStream(OutputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.tribble.readers.PositionalBufferedStream.readFileByLine(String, InputStream): new java.io.InputStreamReader(InputStream)
<b>Dm</b>	Found reliance on default encoding in new htsjdk.tribble.readers.SynchronousLineReader(InputStream): new java.io.InputStreamReader(InputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.tribble.readers.TabixReader.readIndex(SeekableStream): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.tribble.util.LittleEndianInputStream.readString(): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.tribble.util.TabixUtils.getSequenceDictionary(File): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.bcf2.BCF2Decoder.decodeLiteralString(int): new String(byte[], int, int)
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.bcf2.BCFVersion.<static initializer for BCFVersion>(): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in new htsjdk.variant.variantcontext.Allele(String, boolean): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in new htsjdk.variant.variantcontext.Allele(byte[], boolean): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.Allele.acceptableAlleleBases(String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.Allele.acceptableAlleleBases(String, boolean): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.Allele.basesMatch(String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.Allele.create(String, boolean): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.Allele.getBaseString(): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.Allele.getDisplayString(): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.Allele.wouldBeSymbolicAllele(byte[]): new String(byte[])
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.VariantContext.getAllele(String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.writer.BCF2Encoder.encodeRawString(String, int): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.writer.BCF2Encoder.encodeTypedString(String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.writer.BCF2Encoder.stringToBytes(String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.variantcontext.writer.BCF2Writer.writeHeader(VCFHeader): new java.io.OutputStreamWriter(OutputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.vcf.AbstractVCFCodec.isVCFStream(InputStream, String): String.getBytes()
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.vcf.VCFRecordCodec.setInputStream(InputStream): new java.io.InputStreamReader(InputStream)
<b>Dm</b>	Found reliance on default encoding in htsjdk.variant.vcf.VCFRecordCodec.setOutputStream(OutputStream): new java.io.PrintStream(OutputStream)



## Malicious code vulnerability Warnings

Code	Warning
<b>MS</b>	htsjdk.samtools.cram.CRAIEntry.byStartDesc isn't final but should be
<b>MS</b>	htsjdk.samtools.reference.ReferenceSequenceFileFactory.FASTA_EXTENSIONS is a mutable collection
<b>MS</b>	htsjdk.samtools.SamReaderFactory\$Option.DEFAULTS isn't final but should be
<b>MS</b>	htsjdk.samtools.SAMRecord.TAGS_TO_REVERSE isn't final but should be
<b>MS</b>	htsjdk.samtools.SAMRecord.TAGS_TO_REVERSE_COMPLEMENT isn't final but should be
<b>MS</b>	htsjdk.samtools.util.ftp.FTPClient.READ_TIMEOUT isn't final but should be
<b>MS</b>	htsjdk.samtools.util.IOUtil.VCF_EXTENSIONS is a mutable array
<b>MS</b>	htsjdk.samtools.util.TestUtil.RANDOM_SEED isn't final but should be
<b>MS</b>	htsjdk.tribble.index.interval.IntervalIndexCreator.DEFAULT_FEATURE_COUNT isn't final but should be
<b>MS</b>	htsjdk.tribble.index.linear.LinearIndexCreator.DEFAULT_BIN_WIDTH isn't final but should be
<b>MS</b>	htsjdk.tribble.index.tabix.TabixFormat.BED isn't final but should be
<b>MS</b>	htsjdk.tribble.index.tabix.TabixFormat.VCF isn't final but should be
<b>MS</b>	htsjdk.tribble.util.ParsingUtils.colorCache isn't final but should be

## Multithreaded correctness Warnings

Code	Warning
<b>SC</b>	new htsjdk.samtools.util.AbstractAsyncWriter(int) invokes Thread.start()

## Performance Warnings

Code	Warning
<b>Bx</b>	Boxing/unboxing to parse a primitive new htsjdk.samtools.cram.common.Version(String)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.samtools.cram.compression.ExternalCompression.<static initializer for ExternalCompression>()
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.samtools.reference.FastaSequenceIndex.parseIndexFile(InputStream)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.samtools.reference.FastaSequenceIndex.parseIndexFile(InputStream)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.samtools.TextTagCodec.convertStringToObject(String, String)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.tribble.example.CountRecords.main(String[])
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.tribble.example.ProfileIndexReading.main(String[])
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.tribble.index.linear.LinearIndex.<static initializer for LinearIndex>()
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.tribble.readers.PositionalBufferedStream.main(String[])
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.variant.variantcontext.CommonInfo.getAttributeAsInt(String, int)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.variant.variantcontext.Genotype.getAttributeAsInt(String, int)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.variant.variantcontext.VariantContext.validateChromosomeCounts()
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.variant.vcf.AbstractVCFCodec.createGenotypeMap(String, List, String, int)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.variant.vcf.AbstractVCFCodec.oneAllele(String, List)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.variant.vcf.AbstractVCFCodec.parseVCFLine(String[], boolean)
<b>Bx</b>	Boxing/unboxing to parse a primitive new htsjdk.variant.vcf.VCFCompoundHeaderLine(String, VCFHeaderVersion, VCFCompoundHeaderLine\$SupportedHeaderLineType)
<b>Bx</b>	Boxing/unboxing to parse a primitive htsjdk.variant.vcf.VCFContigHeaderLine.getSAMSequenceRecord()
<b>Dm</b>	htsjdk.samtools.util.FileAppendStreamLRUCache\$Functor.makeValue(File) forces garbage collection; extremely dubious except in benchmarking code
<b>Dm</b>	htsjdk.samtools.util.SortingCollection.add(Object) forces garbage collection; extremely dubious except in benchmarking code
<b>Dm</b>	htsjdk.samtools.util.SortingCollection\$MergingIterator.checkMemoryAndAdjustBuffer(int) forces garbage collection; extremely dubious except in benchmarking code

## Dodgy code Warnings

Code	Warning
<b>FE</b>	Test for floating point equality in htsjdk.samtools.util.Histogram.trimByTailLimit(int)
<b>FE</b>	Test for floating point equality in htsjdk.tribble.index.linear.LinearIndex\$ChrIndex.getNFeaturesOfMostDenseBlock(double)
<b>IA</b>	Potentially ambiguous invocation of either an outer or inherited method htsjdk.samtools.util.AbstractIterator.hasNext() in new htsjdk.tribble.readers.AsciiLineReaderIterator\$TupleIterator(AsciiLineReaderIterator)
<b>NS</b>	Potentially dangerous use of non-short-circuit logic in htsjdk.samtools.util.CigarUtil.elementStraddlesClippedRead(List, CigarElement, int, int)
<b>RCN</b>	Redundant nullcheck of htsjdk.variant.vcf.AbstractVCFCodec.header, which is known to be non-null in htsjdk.variant.vcf.AbstractVCFCodec.decodeLine(String, boolean)
<b>ST</b>	Write to static field htsjdk.tribble.util.HTTPHelper.proxy from instance method new htsjdk.tribble.util.HTTPHelper(URL)
<b>UC</b>	Useless condition: it's known that $i3 > -1$ at this point

## Details

### DM\_BOXED\_PRIMITIVE\_FOR\_PARSING: Boxing/unboxing to parse a primitive

A boxed primitive is created from a String, just to extract the unboxed primitive value. It is more efficient to just call the static parseXXX method.

### CN\_IMPLEMENTES\_CLONE\_BUT\_NOT\_CLONEABLE: Class defines clone() but doesn't implement Cloneable

This class defines a clone() method but the class doesn't implement Cloneable. There are some situations in which this is OK (e.g., you want to control how subclasses can clone themselves), but just make sure that this is what you intended.

## **DM\_GC: Explicit garbage collection; extremely dubious except in benchmarking code**

Code explicitly invokes garbage collection. Except for specific use in benchmarking, this is very dubious.

In the past, situations where people have explicitly invoked the garbage collector in routines such as close or finalize methods has led to huge performance black holes. Garbage collection can be expensive. Any situation that forces hundreds or thousands of garbage collections will bring the machine to a crawl.

## **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.

## **FE\_FLOATING\_POINT\_EQUALITY: Test for floating point equality**

This operation compares two floating point values for equality. Because floating point calculations may involve rounding, calculated float and double values may not be accurate. For values that must be precise, such as monetary values, consider using a fixed-precision type such as BigDecimal. For values that need not be precise, consider comparing for equality within some range, for example: `if ( Math.abs(x - y) < .0000001 )`. See the Java Language Specification, section 4.2.4.

## **HE\_EQUALS\_USE\_HASHCODE: Class defines equals() and uses Object.hashCode()**

This class overrides equals(Object), but does not override hashCode(), and inherits the implementation of hashCode() from java.lang.Object (which returns the identity hash code, an arbitrary value assigned to the object by the VM). Therefore, the class is very likely to violate the invariant that equal objects must have equal hashcodes.

If you don't think instances of this class will ever be inserted into a HashMap/HashTable, the recommended hashCode implementation to use is:

```
public int hashCode() {
    assert false : "hashCode not designed";
    return 42; // any arbitrary constant will do
}
```

## **IA\_AMBIGUOUS\_INVOCATION\_OF\_INHERITED\_OR\_OUTER\_METHOD: Potentially ambiguous invocation of either an inherited or outer method**

An inner class is invoking a method that could be resolved to either a inherited method or a method defined in an outer class. For example, you invoke `foo(17)`, which is defined in both a superclass and in an outer method. By the Java semantics, it will be resolved to invoke the inherited method, but this may not be what you intend.

If you really intend to invoke the inherited method, invoke it by invoking the method on super (e.g., invoke `super.foo(17)`), and thus it will be clear to other readers of your code and to SpotBugs that you want to invoke the inherited method, not the method in the outer class.

If you call `this.foo(17)`, then the inherited method will be invoked. However, since SpotBugs only looks at classfiles, it can't tell the difference between an invocation of `this.foo(17)` and `foo(17)`, it will still complain about a potential ambiguous invocation.

## **ICAST\_INT\_CAST\_TO\_DOUBLE\_PASSED\_TO\_CEIL: Integral value cast to double and then passed to Math.ceil**

This code converts an integral value (e.g., int or long) to a double precision floating point number and then passing the result to the Math.ceil() function, which rounds a double to the next higher integer value. This operation should always be a no-op, since the converting an integer to a double should give a number with no fractional part. It is likely that the operation that generated the value to be passed to Math.ceil was intended to be performed using double precision floating point arithmetic.

## **INT\_BAD\_COMPARISON\_WITH\_NONNEGATIVE\_VALUE: Bad comparison of nonnegative value with negative constant or zero**

This code compares a value that is guaranteed to be non-negative with a negative constant or zero.

## **MS\_MUTABLE\_ARRAY: Field is a mutable array**

A final static field references an array and can be accessed by malicious code or by accident from another package. This code can freely modify the contents of the array.

## **MS\_MUTABLE\_COLLECTION: Field is a mutable collection**

A mutable collection instance is assigned to a final static field, thus can be changed by malicious code or by accident from another package. Consider wrapping this field into Collections.unmodifiableSet/List/Map/etc. to avoid this vulnerability.

## **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.

## **NS\_DANGEROUS\_NON\_SHORT\_CIRCUIT: Potentially dangerous use of non-short-circuit logic**

This code seems to be using non-short-circuit logic (e.g., & or |) rather than short-circuit logic (&& or ||). In addition, it seem possible that, depending on the value of the left hand side, you might not want to evaluate the right hand side (because it would have side effects, could cause an exception or could be expensive).



Non-short-circuit logic causes both sides of the expression to be evaluated even when the result can be inferred from knowing the left-hand side. This can be less efficient and can result in errors if the left-hand side guards cases when evaluating the right-hand side can generate an error.

See [the Java Language Specification](#) for details.

## **RCN\_REDUNDANT\_NULLCHECK\_WOULD\_HAVE\_BEEN\_A\_NPE: Nullcheck of value previously dereferenced**

A value is checked here to see whether it is null, but this value can't be null because it was previously dereferenced and if it were null a null pointer exception would have occurred at the earlier dereference. Essentially, this code and the previous dereference disagree as to whether this value is allowed to be null. Either the check is redundant or the previous dereference is erroneous.

## **RCN\_REDUNDANT\_NULLCHECK\_OF\_NONNULL\_VALUE: Redundant nullcheck of value known to be non-null**

This method contains a redundant check of a known non-null value against the constant null.

## **RV\_EXCEPTION\_NOT\_THROWN: Exception created and dropped rather than thrown**

This code creates an exception (or error) object, but doesn't do anything with it. For example, something like

```
if (x < 0) {
    new IllegalArgumentException("x must be nonnegative");
}
```

It was probably the intent of the programmer to throw the created exception:

```
if (x < 0) {
    throw new IllegalArgumentException("x must be nonnegative");
}
```

## **SC\_START\_IN\_CTOR: Constructor invokes Thread.start()**

The constructor starts a thread. This is likely to be wrong if the class is ever extended/subclassed, since the thread will be started before the subclass constructor is started.

## **SE\_BAD\_FIELD\_INNER\_CLASS: Non-serializable class has a serializable inner class**

This Serializable class is an inner class of a non-serializable class. Thus, attempts to serialize it will also attempt to associate instance of the outer class with which it is associated, leading to a runtime error.

If possible, making the inner class a static inner class should solve the problem. Making the outer class serializable might also work, but that would mean serializing an instance of the inner class would always also serialize the instance of the outer class, which it often not what you really want.

## **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.

## **UC\_USELESS\_CONDITION: Condition has no effect**

This condition always produces the same result as the value of the involved variable that was narrowed before. Probably something else was meant or the condition can be removed.

## **UR\_UNINIT\_READ\_CALLED\_FROM\_SUPER\_CONSTRUCTOR: Uninitialized read of field method called from constructor of superclass**

This method is invoked in the constructor of the superclass. At this point, the fields of the class have not yet initialized.

To make this more concrete, consider the following classes:

```
abstract class A {
    int hashCode;
    abstract Object getValue();

    A() {
        hashCode = getValue().hashCode();
    }
}

class B extends A {
    Object value;

    B(Object v) {
        this.value = v;
    }

    Object getValue() {
        return value;
    }
}
```

When a `B` is constructed, the constructor for the `A` class is invoked *before* the constructor for `B` sets `value`. Thus, when the constructor for `A` invokes `getValue`, an uninitialized value is read for `value`.

