Table 1

		AapacheCommonsLan	g		
		<u> </u>			
ersion	Breakdown by Package	Breakdown by Class	Line Coverage	Mutation	
V 3.6			95	86	
	org.apache.commons.lang3		98	89	
		Name	Line Coverage	Mutation	
		AnnotationUtils.java	85%	86%	
		ArchUtils.java	90%	90%	
		<u>ArrayUtils.java</u>	99%	87%	
		BitField.java	100%	97%	
		BooleanUtils.java	100%	100%	
		CharEncoding.java	100%	100%	
		<u>CharRange.java</u>	100%	92%	
		CharSequenceUtils.java	95%	85%	
		<u>CharSet.java</u>	100%	95%	
		<u>CharSetUtils.java</u>	100%	100%	
		CharUtils.java	100%	99%	
		<u>ClassPathUtils.java</u>	100%	100%	
		<u>ClassUtils.java</u>	96%	94%	
		Conversion.java	93%	83%	
		EnumUtils.java	100%	98%	
		<u>JavaVersion.java</u>	90%	73%	
		<u>LocaleUtils.java</u>	100%	100%	
		NotImplementedException.java	100%	100%	
		ObjectUtils.java	96%	96%	
		RandomStringUtils.java	100%	95%	
		RandomUtils.java	100%	87%	
		Range.java	99%	90%	
		SerializationUtils.java	93%	95%	
		StringEscapeUtils.java	100%	100%	
		StringUtils.java	100%	92%	
		<u>SystemUtils.java</u>	98%	96%	
		ThreadUtils.java	100%	89%	
		<u>Validate.java</u>	96%	86%	
			100	100	
	org.apache.commons.lang3.arch	Name		Mutation	
		Processor.java	Line Coverage	100%	
		riocessoi.java	10070	100 /0	
	org anache commons lang3 builder			83	
	org.apache.commons.lang3.builder	Name	90	83 Mutation	
	org.apache.commons.lang3.builder	Name			
	org.apache.commons.lang3.builder	Name CompareToBuilder.java	90 Line Coverage	Mutation	
	org.apache.commons.lang3.builder	Name	90 Line Coverage 91%	Mutation 88%	
	org.apache.commons.lang3.builder	Name CompareToBuilder.java Diff.java DiffBuilder.java	90 Line Coverage 91% 100%	Mutation 88% 100%	
	org.apache.commons.lang3.builder	Name CompareToBuilder.java Diff.java DiffBuilder.java DiffResult.java	90 Line Coverage 91% 100% 100%	Mutation 88% 100% 81%	
	org.apache.commons.lang3.builder	Name CompareToBuilder.java Diff.java DiffBuilder.java	90 Line Coverage 91% 100% 100% 100%	Mutation 88% 100% 81% 100%	
	org.apache.commons.lang3.builder	Name Compare ToBuilder.java Diff.java DiffBuilder.java DiffResult.java EqualsBuilder.java HashCodeBuilder.java	90 Line Coverage 91% 100% 100% 100% 93%	Mutation 88% 100% 81% 100% 88%	
	org.apache.commons.lang3.builder	Name Compare To Builder. java Diff. java Diff Builder. java Diff Result. java Equals Builder. java	90 Line Coverage 91% 100% 100% 100% 93% 97%	Mutation 88% 100% 81% 100% 88% 96%	
	org.apache.commons.lang3.builder	Name Compare ToBuilder.java Diff.java DiffBuilder.java DiffResult.java EqualsBuilder.java HashCodeBuilder.java IDKey.java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82%	Mutation 88% 100% 81% 100% 88% 96% 57%	
	org.apache.commons.lang3.builder	Name CompareToBuilder.java Diff.java DiffBuilder.java DiffResult.java EqualsBuilder.java HashCodeBuilder.java IDKey.java MultilineRecursiveToStringStyle.java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79%	Mutation 88% 100% 81% 100% 88% 96% 57% 79%	
	org.apache.commons.lang3.builder	Name Compare To Builder. java Diff. java Diff Builder. java Diff Result. java Equals Builder. java Hash Code Builder. java IDKey. java Multiline Recursive To String Style. java Recursive To String Style. java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100%	
	org.apache.commons.lang3.builder	Name Compare To Builder. java Diff. java Diff Builder. java Diff Result. java Equals Builder. java Hash Code Builder. java IDKey. java Multiline Recursive To String Style. java Recursive To String Style. java Reflection Diff Builder. java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100% 91%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100% 82%	
	org.apache.commons.lang3.builder	Name Compare To Builder. java Diff. java Diff Builder. java Diff Builder. java Diff Result. java Equals Builder. java Hash Code Builder. java IDKey. java Multiline Recursive To String Style. java Recursive To String Style. java Reflection Diff Builder. java Reflection To String Builder. java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100% 91% 94%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100% 82% 84%	
	org.apache.commons.lang3.builder	Name CompareToBuilder.java Diff.java DiffBuilder.java DiffBuilder.java DiffResult.java EqualsBuilder.java HashCodeBuilder.java IDKey.java MultilineRecursiveToStringStyle.java RecursiveToStringStyle.java ReflectionDiffBuilder.java ReflectionToStringBuilder.java StandardToStringStyle.java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100% 91% 94% 37%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100% 82% 84% 3%	
	org.apache.commons.lang3.builder	Name Compare To Builder. java Diff. java Diff Builder. java Diff Builder. java Diff Result. java Equals Builder. java Hash Code Builder. java IDKey. java Multiline Recursive To String Style. java Recursive To String Style. java Reflection Diff Builder. java Reflection To String Builder. java Standard To String Style. java To String Builder. java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100% 91% 94% 37% 100%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100% 82% 84% 3% 100%	
		Name Compare To Builder. java Diff. java Diff Builder. java Diff Builder. java Diff Result. java Equals Builder. java Hash Code Builder. java IDKey. java Multiline Recursive To String Style. java Recursive To String Style. java Reflection Diff Builder. java Reflection To String Builder. java Standard To String Style. java To String Builder. java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100% 91% 94% 37% 100%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100% 82% 84% 3% 100%	
	org.apache.commons.lang3.builder org.apache.commons.lang3.concurrent	Name Compare To Builder. java Diff. java Diff Builder. java Diff Builder. java Diff Result. java Equals Builder. java Hash Code Builder. java IDKey. java Multiline Recursive To String Style. java Recursive To String Style. java Reflection Diff Builder. java Reflection To String Builder. java Standard To String Style. java To String Builder. java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100% 91% 94% 37% 100% 88%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100% 82% 84% 3% 100% 76%	
		Name CompareToBuilder.java Diff.java DiffBuilder.java DiffBuilder.java DiffResult.java EqualsBuilder.java HashCodeBuilder.java IDKey.java MultilineRecursiveToStringStyle.java RecursiveToStringStyle.java ReflectionDiffBuilder.java ReflectionToStringBuilder.java StandardToStringStyle.java ToStringBuilder.java ToStringStyle.java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100% 91% 94% 37% 100% 88%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100% 82% 84% 3% 100% 76%	
		Name CompareToBuilder.java Diff.java DiffBuilder.java DiffResult.java DiffResult.java EqualsBuilder.java HashCodeBuilder.java IDKey.java MultilineRecursiveToStringStyle.java RecursiveToStringStyle.java ReflectionDiffBuilder.java ReflectionToStringBuilder.java StandardToStringStyle.java ToStringBuilder.java ToStringBuilder.java	90 Line Coverage 91% 100% 100% 100% 93% 97% 82% 79% 100% 91% 94% 37% 100% 88%	Mutation 88% 100% 81% 100% 88% 96% 57% 79% 100% 82% 84% 3% 100% 76% 94 Mutation	

	AapacheCommonsLar	ισ		
		100%	95%	
	BackgroundInitializer.java	100%	100%	
	Basic Thread Factory. java	100%	100%	
	<u>CallableBackgroundInitializer.java</u>			
	ConcurrentUtils.java	96%	100%	
	ConstantInitializer.java	100%	90%	
	EventCountCircuitBreaker.java	100%	88%	
	<u>LazyInitializer.java</u>	100%	33%	
	<u>Memoizer.java</u>	88%	89%	
	MultiBackgroundInitializer.java	100%	100%	
	ThresholdCircuitBreaker.java	100%	90%	
	TimedSemaphore.java	100%	98%	
org.apache.commons.lang3.event		94	96	
	Name	Line Coverage	Mutation	
	EventListenerSupport.java	98%	93%	
	EventUtils.java	86%	100%	
org.apache.commons.lang3.exception		96	80	
org.apache.commons.tango.exception	Name	Line Coverage	Mutation	
		100%	90%	
	ContextedException.java ContextedPuntimeException java	100%	90%	
	ContextedRuntimeException.java	100%	80%	
	DefaultExceptionContext.java			
	ExceptionUtils.java	93%	78%	
			27	
org.apache.commons.lang3.math		98	85 No. 11	
	Name	Line Coverage	Mutation	
	Fraction.java	98%	85%	
	IEEE754rUtils.java	100%	96%	
	NumberUtils.java	98%	84%	
org.apache.commons.lang3.mutable		100	100	
	Name	Line Coverage	Mutation	
	MutableBoolean.java	100%	100%	
		100%	100%	
	MutableByte.java			
	MutableByte.java MutableDouble.java	100%	100%	
	MutableByte.java MutableDouble.java MutableFloat.java	100% 100% 100%	100% 100% 100%	
	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java	100% 100% 100% 100%	100% 100% 100% 100%	
	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java	100% 100% 100% 100%	100% 100% 100% 100% 97%	
	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java	100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100%	
	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java	100% 100% 100% 100%	100% 100% 100% 100% 97%	
	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java	100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100%	
org.apache.commons.lang3.reflect	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java	100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100%	
org.apache.commons.lang3.reflect	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 73 Mutation	
org.apache.commons.lang3.reflect	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java Name ConstructorUtils.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 73 Mutation 96%	
org.apache.commons.lang3.reflect	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85%	
org.apache.commons.lang3.reflect	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java Name ConstructorUtils.java InheritanceUtils.java	100% 100% 100% 100% 100% 100% 100% 82 Line Coverage 93% 99% 100%	100% 100% 100% 100% 97% 100% 100% 100% 85% 92%	
org.apache.commons.lang3.reflect	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85%	
org.apache.commons.lang3.reflect	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java Name ConstructorUtils.java InheritanceUtils.java	100% 100% 100% 100% 100% 100% 100% 82 Line Coverage 93% 99% 100%	100% 100% 100% 100% 97% 100% 100% 100% 85% 92%	
org.apache.commons.lang3.reflect	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java InheritanceUtils.java MemberUtils.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 100% 85% 92% 80%	
org.apache.commons.lang3.reflect	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java Name ConstructorUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85% 92% 80% 80%	
org.apache.commons.lang3.reflect	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java MutableShort.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44%	
	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java MutableShort.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44%	
org.apache.commons.lang3.reflect org.apache.commons.lang3.text	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java Name ConstructorUtils.java FieldUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64%	
	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java Name ConstructorUtils.java FieldUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation	
	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java MutableShort.java Name ConstructorUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java Name CompositeFormat.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation 100%	
	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableCobject.java MutableShort.java MutableShort.java MutableShort.java MutableShort.java Name ConstructorUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java TypeUtils.java Name CompositeFormat.java ExtendedMessageFormat.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation 100% 70%	
	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java MutableShort.java FieldUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java Name CompositeFormat.java ExtendedMessageFormat.java FormattableUtils.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation 100% 70% 82%	
	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java MutableShort.java Name ConstructorUtils.java FieldUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java TypeUtils.java ExtendedMessageFormat.java FormattableUtils.java StrBuilder.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation 100% 70% 82% 75%	
	MutableByte.java MutableDouble.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java Name ConstructorUtils.java FieldUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java TypeUtils.java StrEuilder.java StrLookup.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation 100% 70% 82% 75% 100%	
	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java Name ConstructorUtils.java FieldUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java StrBuilder.java StrMatcher.java StrMatcher.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation 100% 70% 82% 75% 100% 96%	
	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java MutableShort.java Name ConstructorUtils.java FieldUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java TypeUtils.java ExtendedMessageFormat.java FormattableUtils.java StrBuilder.java StrLookup.java StrSubstitutor.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 100% 97% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation 100% 70% 82% 75% 100% 96% 86%	
	MutableByte.java MutableFloat.java MutableInt.java MutableLong.java MutableObject.java MutableShort.java MutableShort.java Name ConstructorUtils.java FieldUtils.java InheritanceUtils.java MemberUtils.java MethodUtils.java TypeLiteral.java TypeUtils.java StrBuilder.java StrMatcher.java StrMatcher.java	100% 100% 100% 100% 100% 100% 100% 100%	100% 100% 100% 100% 97% 100% 100% 100% 73 Mutation 96% 85% 92% 80% 83% 44% 64% 80 Mutation 100% 70% 82% 75% 100% 96%	

org.apache.commons.lang3.text.translat	Name AggregateTranslator.java CharSequenceTranslator.java CodePointTranslator.java EntityArrays.java JavaUnicodeEscaper.java	97 Line Coverage 100% 94% 100% 100%	86 Mutation 100% 85% 100%	
org.apache.commons.lang3.text.translat	AggregateTranslator.java CharSequenceTranslator.java CodePointTranslator.java EntityArrays.java	100% 94% 100%	Mutation 100% 85%	
	AggregateTranslator.java CharSequenceTranslator.java CodePointTranslator.java EntityArrays.java	100% 94% 100%	100% 85%	
	CharSequenceTranslator.java CodePointTranslator.java EntityArrays.java	94% 100%	85%	
	CodePointTranslator.java EntityArrays.java	100%		
	EntityArrays.java		100%	
	* * *	100%		
	JavaUnicodeEscaper.java		15%	
		63%	20%	
	LookupTranslator.java	100%	83%	
	NumericEntityEscaper.java	100%	100%	
	NumericEntityUnescaper.java	100%	96%	
	OctalUnescaper.java	100%	94%	
	<u>UnicodeEscaper.java</u>	88%	91%	
	UnicodeUnescaper.java	100%	86%	
<u>Ur</u>	nicodeUnpairedSurrogateRemover.java	100%	100%	
org.apache.commons.lang3.time		96	87	
	Name	Line Coverage	Mutation	
	DateFormatUtils.java	98%	94%	
	<u>DateUtils.java</u>	97%	94%	
	DurationFormatUtils.java	95%	89%	
	FastDateFormat.java	94%	90%	
	FastDateParser.java	99%	92%	
	FastDatePrinter.java	95%	77%	
	FormatCache.java	92%	77%	
	StopWatch.java	99%	88%	
org.apache.commons.lang3.tuple		99	89	
<u>Signification and State of the State of the</u>	Name	Line Coverage	Mutation	
	ImmutablePair.java	90%	100%	
	ImmutableTriple.java	100%	100%	
	MutablePair.java	100%	80%	
	MutableTriple.java	100%	100%	
	Pair.java	100%	100%	
	Triple.java	100%	72%	
	111pic.java	10070	. 2 /0	