

Table 2: Amplification results on 40 real world test classes from major open-source projects. The major result is that amplification enables to improve the mutation score of 25 tests, with a minimum increase of 0.22% and a maximum increase of 492.86%

ID	project	class	# Orig. test methods	Proportional Mutation Score	# New test methods	RQ1				RQ2			time(min)	
						# Executed expressions Orig.	# Executed expressions Ampl.	Expr. Coverage Increase		# Killed mutants orig	# Killed mutants ampl	Increase killed AMIx		
High Mutation Score														
1	javapoet	UtilTest	2	87.5%	11	72	113	56.94%	↗	63	86	36.51%	↗	0.38
2	javapoet	NameAllocatorTest	11	85.26%	3	95	95	0.0%	→	81	85	4.94%	↗	8.16
3	mybatis	SqlBuilderTest	5	100.0%	3	192	208	8.33%	↗	192	196	2.08%	↗	14.15
4	mybatis	SelectBuilderTest	5	100.0%	2	192	201	4.69%	↗	192	195	1.56%	↗	15.14
5	traccar	PatternBuilderTest	1	100.0%	2	42	49	16.67%	↗	42	46	9.52%	↗	2.87
6	traccar	StringFinderTest	1	100.0%	0	14	14	0.0%	→	14	14	0.0%	→	0.44
7	stream-lib	TestLookup3Hash	2	95.67%	2	485	491	1.24%	↗	464	465	0.22%	↗	6.55
8	stream-lib	TestDoublyLinkedList	7	92.79%	7	111	113	1.8%	↗	103	106	2.91%	↗	7.33
9	mustache.java	HtmlEscaperTest	1	100.0%	0	15	15	0.0%	→	15	15	0.0%	→	6.21
10	mustache.java	ClasspathResolverTest	10	67.57%	0	74	74	0.0%	→	50	50	0.0%	→	11.23
11	twilio-java	UrlUtilsTest	18	100.0%	0	135	135	0.0%	→	135	135	0.0%	→	52.57
12	twilio-java	EnqueueTest	2	100.0%	16	40	46	15.0%	↗	40	46	15.0%	↗	7.32
13	jsoup	ParserSettingsTest	1	100.0%	7	14	205	1364.29%	↗	14	83	492.86%	↗	2.96
14	jsoup	CharacterReaderTest	19	79.69%	8	384	385	0.26%	↗	306	312	1.96%	↗	21.78
15	jsoup	AttributesTest	5	53.01%	93	598	663	10.87%	↗	317	375	18.3%	↗	18.24
16	protostuff	LowCopyProtostuffOutputTest	1	75.96%	0	470	470	0.0%	→	357	357	0.0%	→	1.30
17	protostuff	LinkBufferTest	3	75.86%	8	87	136	56.32%	↗	66	89	34.85%	↗	7.42
18	protostuff	CodedInputTest	1	59.78%	29	179	406	126.82%	↗	107	193	80.37%	↗	5.02
19	logback	SecureRandomFactoryBeanTest	4	100.0%	0	30	30	0.0%	→	30	30	0.0%	→	7.71
20	logback	SyslogAppenderBaseTest	1	99.31%	3	144	149	3.47%	↗	143	148	3.5%	↗	8.52
21	retrofit	ResponseTest	14	100.0%	0	89	89	0.0%	→	89	89	0.0%	→	4.23
22	retrofit	ServiceMethodTest	1	100.0%	0	10	10	0.0%	→	10	10	0.0%	→	0.77
23	retrofit	ExecutorCallAdapterFactoryTest	7	60.0%	2	190	198	4.21%	↗	114	129	13.16%	↗	16.17
24	retrofit	CallTest	35	69.15%	116	927	1026	10.68%	↗	641	668	4.21%	↗	295.53
Low Mutation Score														
25	javapoet	FieldSpecTest	2	30.7%	1	733	733	0.0%	→	225	226	0.44%	↗	2.61
26	javapoet	ParameterSpecTest	2	31.21%	1	692	692	0.0%	→	216	217	0.46%	↗	2.37
27	mybatis	WrongNamespacesTest	2	8.93%	2	873	873	0.0%	→	78	251	221.79%	↗	9.22
28	mybatis	WrongMapperTest	1	8.83%	1	1099	1099	0.0%	→	97	328	238.14%	↗	5.26
29	traccar	GeolocationProviderTest	1	0.0%	0	4	4	0.0%	→	0	0	0.0%	→	0.16
30	traccar	At2000ProtocolDecoderTest	1	0.0%	0	4	4	0.0%	→	0	0	0.0%	→	9.26
31	stream-lib	TestICardinality	2	7.66%	0	248	248	0.0%	→	19	19	0.0%	→	4.98
32	stream-lib	TestMurmurHash	2	25.74%	41	202	329	62.87%	↗	52	308	492.31%	↗	5.18
33	mustache.java	ConcurrencyTest	2	28.61%	0	720	720	0.0%	→	206	206	0.0%	→	123.54
34	mustache.java	ExplicitMapNullTest	1	41.37%	3	568	629	10.74%	↗	235	272	15.74%	↗	2.19
35	twilio-java	AllTimeTest	3	42.89%	4	387	391	1.03%	↗	166	168	1.2%	↗	42.51
36	twilio-java	DailyTest	3	42.89%	4	387	391	1.03%	↗	166	168	1.2%	↗	37.03
37	jsoup	AttributeTest	2	41.42%	17	437	526	20.37%	↗	181	230	27.07%	↗	2.60
38	protostuff	CodedDataInputTest	1	1.11%	0	449	449	0.0%	→	5	5	0.0%	→	25.77
39	logback	FileAppenderResilience_AS_ROOT_Test	1	4.6%	0	87	87	0.0%	→	4	4	0.0%	→	0.68
40	logback	Basic	1	10.53%	0	57	57	0.0%	→	6	6	0.0%	→	1.65