

Table B.2: False positives added by semistructured merge in terms of merge scenarios.

Project	Merge Scenarios	Merge Scenarios with Renaming or Deletion Conflicts	(%)
Activiti	786	10	1.27
AndEngine	115	4	3.48
andlytics	560	5	0.89
AntennaPod	519	11	2.12
antlr4	656	21	3.2
atmosphere	244	6	2.46
BroadleafCommerce	898	57	6.35
Bukkit	19	2	10.53
cassandra	3360	299	8.9
cgeo	1890	46	2.43
clojure	37	1	2.7
closure-compiler	233	0	0
cloudify	213	5	2.35
commafeed	241	0	0
commons	208	0	0
Conversations	481	1	0.21
cxf	71	2	2.82
deeplearning4j	731	13	1.78
dropwizard	256	3	1.17
Equivalent-Exchange-3	387	1	0.26
Essentials	572	0	0
gradle	554	33	5.96
graylog2-server	212	11	5.19
groovy-core	678	22	3.24
infinispan	23	1	4.35
jedis	192	13	6.77
jenkins	2008	19	0.95
jitsi	78	2	2.56
jsoup	42	0	0
junit	350	7	2
k-9	426	18	4.23
kotlin	499	16	3.21
lucene-solr	209	40	19.14
mct	199	2	1.01
mockito	38	1	2.63
netty	175	5	2.86
OG-Platform	4522	176	3.89
okhttp	1038	2	0.19
OpenRefine	70	0	0
OpenTripPlanner	683	45	6.59
orientdb	817	23	2.82
Osmand	3864	14	0.36
realm-java	782	25	3.2
retrofit	280	2	0.71
roboguice	73	9	12.33
rstudio	1463	6	0.41
rundeck	549	2	0.36
RxJava	418	6	1.44
Spout	854	14	1.64
voldemort	457	23	5.03
Total	34030	1024	3.01
Mean			3.12
Standard Deviation			3.55

Table B.3: False positives added by semistructured merge in terms of conflicts.

Project	Conflicts	Renaming or Deletion Conflicts	(%)
Activiti	123	56	45.53
AndEngine	37	4	10.81
andlytics	49	16	32.65
AntennaPod	152	84	55.26
antlr4	115	58	50.43
atmosphere	89	10	11.24
BroadleafCommerce	516	158	30.62
Bukkit	12	8	66.67
cassandra	4191	788	18.8
cgeo	235	88	37.45
clojure	5	1	20
closure-compiler	1	0	0
cloudify	154	31	20.13
commafeed	1	0	0
commons	0	0	0
Conversations	25	1	4
cxfr	45	9	20
deeplearning4j	100	25	25
dropwizard	9	3	33.33
Equivalent-Exchange-3	78	67	85.9
Essentials	20	0	0
gradle	159	67	42.14
graylog2-server	78	37	47.44
groovy-core	193	124	64.25
infinispan	71	18	25.35
jedis	280	59	21.07
jenkins	178	35	19.66
jitsi	21	7	33.33
jsoup	1	0	0
junit	58	14	24.14
k-9	188	98	52.13
kotlin	112	28	25
lucene-solr	1171	278	23.74
mct	40	2	5
mockito	6	1	16.67
netty	111	72	64.86
OG-Platform	3572	2224	62.26
okhttp	9	3	33.33
OpenRefine	138	0	0
OpenTripPlanner	513	226	44.05
orientdb	445	134	30.11
Osmand	216	30	13.89
realm-java	303	138	45.54
retrofit	13	5	38.46
roboguice	105	56	53.33
rstudio	72	9	12.5
rundeck	16	10	62.5
RxJava	31	10	32.26
Spout	139	42	30.22
voldemort	348	67	19.25
Total	14544	5201	35.76
Mean			30.21
Standard Deviation			20.68

Table B.4: False positives added by unstructured merge in terms of merge scenarios.

Project	Merge Scenarios	Merge Scenarios with Ordering Conflicts	(%)
Activiti	786	22	2.8
AndEngine	115	4	3.48
andlytics	560	9	1.61
AntennaPod	519	17	3.28
antlr4	656	21	3.2
atmosphere	244	7	2.87
BroadleafCommerce	898	123	13.7
Bukkit	19	3	15.79
cassandra	3360	455	13.54
cgeo	1890	77	4.07
clojure	37	0	0
closure-compiler	233	0	0
cloudify	213	7	3.29
commafeed	241	1	0.41
commons	208	1	0.48
Conversations	481	7	1.46
cxfr	71	2	2.82
deeplearning4j	731	46	6.29
dropwizard	256	5	1.95
Equivalent-Exchange-3	387	1	0.26
Essentials	572	2	0.35
gradle	554	51	9.21
graylog2-server	212	21	9.91
groovy-core	678	32	4.72
infinispan	23	3	13.04
jedis	192	23	11.98
jenkins	2008	66	3.29
jitsi	78	2	2.56
jsoup	42	4	9.52
junit	350	22	6.29
k-9	426	27	6.34
kotlin	499	26	5.21
lucene-solr	209	48	22.97
mct	199	5	2.51
mockito	38	3	7.89
netty	175	7	4
OG-Platform	4522	257	5.68
okhttp	1038	2	0.19
OpenRefine	70	2	2.86
OpenTripPlanner	683	82	12.01
orientdb	817	44	5.39
Osmand	3864	51	1.32
realm-java	782	49	6.27
retrofit	280	2	0.71
roboguice	73	9	12.33
rstudio	1463	42	2.87
rundeck	549	5	0.91
RxJava	418	23	5.5
Spout	854	29	3.4
voldemort	457	31	6.78
Total	34030	1778	5.22
Mean			5.35
Standard Deviation			4.85

Table B.5: False positives added by unstructured merge in terms of conflicts.

Project	Conflicts	Ordering Conflicts	(%)
Activiti	166	59	35.54
AndEngine	39	23	58.97
andlytics	82	29	35.37
AntennaPod	142	0	0
antlr4	127	45	35.43
atmosphere	118	50	42.37
BroadleafCommerce	851	299	35.14
Bukkit	12	3	25
cassandra	6796	1496	22.01
cgeo	304	136	44.74
clojure	4	4	100
closure-compiler	0	0	0
cloudify	163	69	42.33
commafeed	2	1	50
commons	1	0	0
Conversations	21	21	100
cxfr	77	24	31.17
deeplearning4j	253	69	27.27
dropwizard	19	6	31.58
Equivalent-Exchange-3	68	11	16.18
Essentials	23	0	0
gradle	288	71	24.65
graylog2-server	145	30	20.69
groovy-core	215	56	26.05
infinispan	90	53	58.89
jedis	293	155	52.9
jenkins	429	121	28.21
jitsi	29	10	34.48
jsoup	7	1	14.29
junit	134	39	29.1
k-9	266	73	27.44
kotlin	171	70	40.94
lucene-solr	1677	833	49.67
mct	44	38	86.36
mockito	57	5	8.77
netty	167	31	18.56
OG-Platform	3066	1235	40.28
okhttp	6	4	66.67
OpenRefine	59	59	100
OpenTripPlanner	649	241	37.13
orientdb	509	240	47.15
Osmand	311	180	57.88
realm-java	322	126	39.13
retrofit	35	6	17.14
roboquice	100	49	49
rstudio	145	58	40
rundeck	18	5	27.78
RxJava	76	21	27.63
Spout	224	91	40.62
voldemort	438	268	61.19
Total	19238	6514	33.86
Mean			38.11
Standard Deviation			23.49

Table B.6: False negatives added by semistructured merge in terms of merge scenarios.

Project	Merge Scenarios	Merge Scenarios with Type Ambiguity Error	Merge Scenarios with New Artefact Referencing Edited One	(%)
Activiti	786	0	0	0
AndEngine	115	0	0	0
andlytics	560	0	0	0
AntennaPod	519	0	4	0.77
antlr4	656	0	1	0.15
atmosphere	244	0	0	0
BroadleafCommerce	898	0	4	0.45
Bukkit	19	0	0	0
cassandra	3360	2	8	0.3
cgeo	1890	0	0	0
clojure	37	0	0	0
closure-compiler	233	0	0	0
cloudify	213	0	0	0
commafeed	241	0	0	0
commons	208	0	0	0
Conversations	481	0	0	0
cxf	71	0	0	0
deeplearning4j	731	0	0	0
dropwizard	256	0	0	0
Equivalent-Exchange-3	387	0	0	0
Essentials	572	0	0	0
gradle	554	0	1	0.18
graylog2-server	212	0	2	0.94
groovy-core	678	0	1	0.15
infinispan	23	0	0	0
jedis	192	0	1	0.52
jenkins	2008	0	2	0.1
jitsi	78	0	0	0
jsoup	42	0	0	0
junit	350	0	0	0
k-9	426	0	0	0
kotlin	499	0	0	0
lucene-solr	209	0	5	2.39
mct	199	0	1	0.5
mockito	38	0	0	0
netty	175	0	1	0.57
OG-Platform	4522	1	13	0.31
okhttp	1038	0	0	0
OpenRefine	70	0	0	0
OpenTripPlanner	683	0	3	0.44
orientdb	817	0	5	0.61
Osmand	3864	0	1	0.03
realm-java	782	0	0	0
retrofit	280	0	0	0
roboguice	73	0	0	0
rstudio	1463	0	0	0
rundeck	549	0	0	0
RxJava	418	0	0	0
Spout	854	0	1	0.12
voldemort	457	0	2	0.44
Total	34030	3	56	0.17
Mean				0.18
Standard Deviation				0.39

Table B.7: False negatives added by semistructured merge in terms of conflicts.

Project	Conflicts	Type Ambiguity Errors	New Artefact Referencing Edited One	(%)
Activiti	123	0	0	0
AndEngine	37	0	0	0
andlytics	49	0	0	0
AntennaPod	152	0	166	52.2
antlr4	115	0	2	1.71
atmosphere	89	0	0	0
BroadleafCommerce	516	0	18	3.37
Bukkit	12	0	0	0
cassandra	4191	14	194	4.75
cgeo	235	0	0	0
clojure	5	0	0	0
closure-compiler	1	0	0	0
cloudify	154	0	0	0
commafeed	1	0	0	0
commons	0	0	0	0
Conversations	25	0	0	0
cxfr	45	0	0	0
deeplearning4j	100	0	0	0
dropwizard	9	0	0	0
Equivalent-Exchange-3	78	0	0	0
Essentials	20	0	0	0
gradle	159	0	1	0.62
graylog2-server	78	0	2	2.5
groovy-core	193	0	1	0.52
infinispan	71	0	0	0
jedis	280	0	1	0.36
jenkins	178	0	2	1.11
jitsi	21	0	0	0
jsoup	1	0	0	0
junit	58	0	0	0
k-9	188	0	0	0
kotlin	112	0	0	0
lucene-solr	1171	0	10	0.85
mct	40	0	2	4.76
mockito	6	0	0	0
netty	111	0	1	0.89
OG-Platform	3572	1	111	3.04
okhttp	9	0	0	0
OpenRefine	138	0	0	0
OpenTripPlanner	513	0	5	0.97
orientdb	445	0	8	1.77
Osmand	216	0	1	0.46
realm-java	303	0	0	0
retrofit	13	0	0	0
roboguice	105	0	0	0
rstudio	72	0	0	0
rundeck	16	0	0	0
RxJava	31	0	0	0
Spout	139	0	1	0.71
voldemort	348	0	9	2.52
Total	14544	15	535	3.78
Mean				1.66
Standard Deviation				7.32

Table B.8: False negatives added by unstructured merge in terms of merge scenarios.

Project	Merge Scenarios	Merge Scenarios with Duplicated Declaration Errors	(%)
Activiti	786	3	0.38
AndEngine	115	3	2.61
andlytics	560	2	0.36
AntennaPod	519	1	0.19
antlr4	656	4	0.61
atmosphere	244	4	1.64
BroadleafCommerce	898	14	1.56
Bukkit	19	1	5.26
cassandra	3360	58	1.73
cgeo	1890	6	0.32
clojure	37	0	0
closure-compiler	233	1	0.43
cloudify	213	5	2.35
commafeed	241	0	0
commons	208	0	0
Conversations	481	0	0
cxf	71	2	2.82
deeplearning4j	731	3	0.41
dropwizard	256	0	0
Equivalent-Exchange-3	387	0	0
Essentials	572	3	0.52
gradle	554	8	1.44
graylog2-server	212	2	0.94
groovy-core	678	4	0.59
infinispan	23	0	0
jedis	192	4	2.08
jenkins	2008	16	0.8
jitsi	78	3	3.85
jsoup	42	0	0
junit	350	4	1.14
k-9	426	3	0.7
kotlin	499	2	0.4
lucene-solr	209	3	1.44
mct	199	0	0
mockito	38	0	0
netty	175	1	0.57
OG-Platform	4522	31	0.69
okhttp	1038	1	0.1
OpenRefine	70	1	1.43
OpenTripPlanner	683	9	1.32
orientdb	817	15	1.84
Osmand	3864	4	0.1
realm-java	782	14	1.79
retrofit	280	1	0.36
roboguice	73	0	0
rstudio	1463	2	0.14
rundeck	549	1	0.18
RxJava	418	0	0
Spout	854	3	0.35
voldemort	457	3	0.66
Total	34030	245	0.72
Mean			0.88
Standard Deviation			1.07

Table B.9: False negatives added by unstructured merge in terms of conflicts.

Project	Conflicts	Duplicated Declaration Errors	(%)
Activiti	166	8	4.6
AndEngine	39	10	20.41
andlytics	82	4	4.65
AntennaPod	142	2	1.39
antlr4	127	12	8.63
atmosphere	118	29	19.73
BroadleafCommerce	851	59	6.48
Bukkit	12	1	7.69
cassandra	6796	1907	21.91
cgeo	304	11	3.49
clojure	4	0	0
closure-compiler	0	4	100
cloudify	163	54	24.88
commafeed	2	0	0
commons	1	0	0
Conversations	21	0	0
cxfr	77	12	13.48
deeplearning4j	253	6	2.32
dropwizard	19	0	0
Equivalent-Exchange-3	68	0	0
Essentials	23	23	50
gradle	288	21	6.8
graylog2-server	145	11	7.05
groovy-core	215	13	5.7
infinispan	90	0	0
jedis	293	66	18.38
jenkins	429	22	4.88
jitsi	29	4	12.12
jsoup	7	0	0
junit	134	5	3.6
k-9	266	17	6.01
kotlin	171	14	7.57
lucene-solr	1677	60	3.45
mct	44	0	0
mockito	57	0	0
netty	167	8	4.57
OG-Platform	3066	113	3.55
okhttp	6	2	25
OpenRefine	59	27	31.4
OpenTripPlanner	649	46	6.62
orientdb	509	71	12.24
Osmand	311	6	1.89
realm-java	322	39	10.8
retrofit	35	2	5.41
roboguice	100	0	0
rstudio	145	5	3.33
rundeck	18	1	5.26
RxJava	76	0	0
Spout	224	6	2.61
voldemort	438	13	2.88
Total	19238	2714	14.10
Mean			9.62
Standard Deviation			16.12