

Ranked fix patterns

Nowack et al.

Fix patterns ranked by the number of their occurrence in Defects4J. Only the patterns with at least 3 occurrences are shown.

	Fix patterns	Occurrences
1	Remove Method Declaration (FP15.2): - methodDeclaration(Arguments) { - ... statement; ... -}	247
2	Mutate Method Invocation (FP10.1): - method1() + method2().method3()	86
3	FP15.1 + FP6.2	68
4	Mutate Variable (FP13.1): - ...var1... + ...var2...	32
5	Mutate Conditional Expression (FP6.3): - ...condExp1... + ...condExp1 Op condExp2...	28
6	Mutate Object and Method (FP13.1.4): - obj1.method1() + obj2.method2(obj1)	22
7	Mutate Variable (FP13.3): - var + new instance	16
8	Insert Missed Statement (FP4.4): + if (conditional_exp) { statement; + }	14
9	Mutate Operator (FP11.1): - ...exp1 Op1 exp2... + ...exp1 Op2 exp2...	11
10	Mutate Literal (FP9.1): - ...literal1... + ...literal2...	11

	Fix patterns	Occurrences
11	Move statement (FP14): - statement; + statement;	10
12	Mutate Variable (FP13.4): - var + method(var, ...)	10
13	Insert Zero Checker (FP4.4.1): + if (var != 0) { statement; ... + }	10
14	Insert Null Pointer Checker (FP2.1): + if (exp != null) { ...exp...; + }	9
15	Insert Declaration with Initialisation (FP4.7): + mod T var = literal	8
16	Insert Declaration without Init. (FP4.8): + T var	7
17	Insert Field Init. (FP4.6): + obj.field = var	7
18	Mutate Object (FP13.1.1): - obj.attr + var	7
19	Insert Null Pointer Checker (FP2.6.1): + if (exp == null) return null;	7
20	Insert Null Pointer Checker (FP2.2): + if (exp == null) return DEFAULT_VALUE ...exp...;	6

	Fix patterns	Occurrences
21	Mutate Method Definition (FP16): - modifier T method(T1 arg1, ...)... + modifier T method(T2 arg2, ...)...	5
22	Mutate Method (FP10.6): - method + var	5
23	Insert Case (FP4.9): + case exp	4
24	Mutate Variable (FP13.1.5): - obj1.method1(obj2) + obj3.method2().method3(obj1, obj2)	4
25	Insert Null Pointer Checker (FP2.6): + if (exp == null) return literal;	4
26	Mutate Variable (FP13.2): - ...var1... + ...exp...	4
27	Insert Missed Statement (FP4.1): + method(exp);	3
28	Insert Missed Statement (FP4.5.1): + var = literal	3
29	Insert Missed Statement (FP4.4.2): + if (conditional_exp) { + statement; ... + }	3
30	Remove Buggy Statement (FP15.1.1): - method()	3
31	Mutate Data Type (FP7.1): - T1 var ...; + T2 var ...;	3