Report on Identified Refactoring Opportunities for (SC/ST) Refactoring

The tool identifies the Control-Fields and conditional constructs (Switch/If) that use these Control-Fields to simulate the (SC / ST) refactoring. It prioritizes the Control-Fields (refactoring opportunities) based on the following criteria:

1. Number of conditional constructs that switch on Control-Field
   Group i represents i different conditional constructs where the Control-Field is used
2. Average size of the conditional body
3. Number of control values
   2-3 control values
   3-6 control values
   6-n control values
4. Presence of conditional constructs with respect to the class of declaration (COD) of Control-Field
   In COD (A)
   Outside (B)
   Mixed (C)
5. Qualified for SC or ST
6. Static Field
7. Have subclasses already

Input Benchmark Statistics:

No. Of Classes: 1731
No. Of Primitive Felds: 1888
No. Of Control-Fields for Subclass Pattern: 20
No. Of Control-Fields for State pattern: 92
Total No. Of Control-Fields: 112

Uses	Replace Type Code with Subclass (SC)	
24	<cck.util.Option.Bool, value>	(B)
8	<avrora.sim.output.EventGen, enabled>	(A)
5	<avrora.monitors.InterruptMonitor.Mon, show>	(A)
4	<avrora.monitors.InterruptMonitor.Mon, invokeOnly>	(A)
3	<avrora.sim.mcu.DefaultMCU.Pin, outputDir>	(A)
	<avrora.monitors.PacketMonitor.Mon, showPackets>	(A)
	<avrora.sim.radio.CC1000Radio.SerialConfigurationInterface, writeCommand>	(A)
	<avrora.monitors.SnifferMonitor.Mon, showTransmitted>	(A)
	<avrora.monitors.SnifferMonitor.Mon, showReceived>	(A)
	<avrora.monitors.PacketMonitor.Mon, cc2420radio>	(A)
2	<avrora.monitors.SnifferMonitor.Mon, Print>	(A)
	<avrora.syntax.Module.Seg, acceptsData>	(A)
	<avrora.sim.clock.BarrierSynchronizer.SynchEvent, removed>	(A)
	<cck.elf.ELFDataInputStream, bigEndian>	(A)
	<avrora.sim.platform.sensors.AccelSensor, on>	(C)
	<avrora.syntax.SyntacticOperand.Expr, simplified>	(A)
	<avrora.monitors.CallTimeMonitor.CallTimeMon, ignore_interrupts>	(A)
	<avrora.sim.util.MemPrint, log>	(A)
	<avrora.stack.StateTransitionGraph.Edge, type>	(B)
	<jintgen.isdl.InstrDecl, pseudo>	(B)

Uses	Replace Type Code with State (ST)	
66	<jintgen.isdl.parser.ISDLParser,jj_ntk>	(A)
40	<avrora.syntax.atmel.AtmelParser,jj_ntk>	(A)
35	<jintgen.isdl.parser.ISDLParserTokenManager,curChar>	(A)
30	<cck.text.Verbose.Printer, enabled>	(C)
23	<avrora.syntax.objdump.ObjDumpParser,jj_ntk>	(A)
19	<avrora.syntax.objdump.ObjDumpParserTokenManager,curChar>	(A)
	<avrora.syntax.atmel.AtmelParserTokenManager,curChar>	(A)
17	<avrora.syntax.atmel.AtmelParser, jj_la>	(A)
12	<avrora.test.probes.ProbeParserTokenManager,curChar>	(A)
11	<avrora.stack.StateCache.Set, delegating>	(A)
9	<avrora.syntax.objdump.ObjDumpParserTokenManager,jjmatchedPos>	(A)
8	<avrora.sim.Simulation, running>	(C)
7	<cck.text.Status, ENABLED>	(A)
6	<avrora.sim.radio.CC1000Radio.MainRegister, corePd>	(C)
	<avrora.sim.AtmelInterpreter, C>	(B)
	<avrora.sim.util.Mem16, state>	(A)
	<avrora.test.probes.ProbeParser,jj_ntk>	(A)
5	<avrora.sim.radio.CC1000Radio.MainRegister, biasPd>	(C)
	<avrora.arch.avr.AVRState, C>	(B)
	<avrora.sim.AtmelInterpreter, nextPC>	(B)
	<avrora.sim.radio.Medium.TXRX, activated>	(B)
	<avrora.sim.mcu.RegisterSet.Field,value>	(B)
	<avrora.syntax.atmel.AtmelParserTokenManager,jjmatchedPos>	(A)

Uses	Replace Type Code with State (ST)	
4	<avrora.sim.radio.CC1000Radio.MainRegister, rxtx>	(C)
	<avrora.sim.radio.CC1000Radio.MainRegister, fsPd>	(C)
	<avrora.arch.msp430.MSP430State, Z>	(B)
	<jintgen.isdl.parser.ISDLParserTokenManager, jjmatchedPos>	(A)
	<avrora.sim.AtmelInterpreter, sleeping>	(B)
	<avrora.arch.msp430.MSP430State, C>	(B)
	<avrora.sim.AtmelInterpreter, N>	(B)
	<avrora.sim.AtmelInterpreter, S>	(B)
	<avrora.sim.AtmelInterpreter, H>	(B)
	<avrora.sim.AtmelInterpreter, I>	(B)
	<avrora.sim.AtmelInterpreter, T>	(B)
	<avrora.sim.AtmelInterpreter, V>	(B)
	<avrora.sim.AtmelInterpreter, Z>	(B)
	<avrora.sim.radio.Medium.Receiver, locked>	(C)
	<avrora.arch.msp430.MSP430Operand, op_type>	(B)
3	<avrora.sim.radio.CC1000Radio.MainRegister, txPd>	(C)
	<avrora.stack.StateCache.State, isExplored>	(B)
	<avrora.arch.avr.AVRState, V>	(B)
	<avrora.arch.avr.AVRState, S>	(B)
	<avrora.arch.avr.AVRState, T>	(B)
	<avrora.arch.avr.AVRState, Z>	(B)
	<avrora.stack.StateCache.Set, empty>	(A)
	<avrora.arch.avr.AVRState, H>	(B)
	<avrora.arch.avr.AVRState, N>	(B)
	<avrora.arch.avr.AVRState, I>	(B)
	<avrora.sim.util.Mem16, count>	(A)
	<avrora.sim.util.Mem8, count>	(A)
	<avrora.sim.mcu.EEPROM, writeEnable>	(B)
	<avrora.sim.FiniteStateMachine, curState>	(C)
	<avrora.stack.Analyzer, TRACE>	(A)
	<jintgen.isdl.parser.ISDLParserTokenManager, jjmatchedKind>	(A)
	<avrora.sim.platform.ExternalFlash,dfOpcode>	(B)
	<avrora.arch.avr.AVROperand,op_type>	(B)
	<avrora.sim.radio.CC2420Radio.Receiver,state>	(A)

Uses	Replace Type Code with State (ST)	
2	<avrora.sim.mcu.ATMegaTimer, countUp>	(B)
	<avrora.syntax.Module, caseSensitivity>	(A)
	<avrora.monitors.PacketMonitor.Mon, bufferPos>	(A)
	<avrora.sim.radio.CC1000Radio.MainRegister, rxPd>	(A)
	<avrora.sim.mcu.Timer8Bit, period>	(B)
	<cck.text.Printer, first>	(A)
	<avrora.sim.radio.CC2420Radio, configRAMBank>	(A)
	<jintgen.gen.disassembler.Decoder, chained>	(B)
	<avrora.stack.isea.ISEAbstractState.Element, read>	(B)
	<jintgen.isdl.OperandTypeDecl.Accessor, polymorphic>	(B)
	<avrora.sim.util.MemTimer, timer_state>	(A)
	<avrora.stack.StateCache.State, onFrontier>	(B)
	<cck.parser.AbstractParseException, specialConstructor>	(B)
	<avrora.sim.mcu.SPI.SPCRReg, prev_spie>	(A)
	<cck.text.Terminal, htmlColors>	(B)
	<avrora.monitors.TraceMonitor.Mon, nesting>	(B)
	<cck.util.Util.Error, STACKTRACES>	(C)
	<avrora.sim.energy.EnergyControl, active>	(A)
	<jintgen.gen.disassembler.Decoder, multiple>	(C)
	<avrora.sim.radio.CC1000Radio.SPITicker, activated>	(A)
	<cck.text.Printer, begLine>	(A)
	<avrora.sim.mcu.ATMegaTimer, timerEnabled>	(A)
	<avrora.sim.mcu.ADC.ControlRegister, converting>	(A)
	<avrora.sim.mcu.SPI.TransferEvent, transmitting>	(C)
	<cck.text.Status, TIMING>	(A)
	<avrora.gui.GraphEvents.MyVector, current>	(B)
	<cck.test.TestEngine, VERBOSE>	(A)
	<cck.stat.MinMaxMean, someData>	(C)
	<cck.text.Terminal, useColors>	(A)
	<avrora.sim.platform.ExternalFlash, isReading>	(B)
	<avrora.syntax.atmel.AtmelParserTokenManager, jjmatchedKind>	(A)

Uses	Replace Type Code with State (ST)	
	<avrora.syntax.objdump.ObjDumpParserTokenManager, jjmatchedKind>	(A)
	<avrora.test.probes.ProbeParserTokenManager, jjmatchedKind>	(A)
	<avrora.sim.platform.ExternalFlash, isSelected>	(B)
	<avrora.sim.radio.CC2420Radio,configCommand>	(A)

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