

# Computer Architectures | II Part - Lab 2

## Ex 2 - Table of hello world simulations

HELLO WORLD SIMULATION	Instr simulated	Instr committed	CPU CC	CPI [CC/instr comm]
AtomicSimpleCPU [atomic]	5277	5277	5307	1.0056850483
TimingSimpleCPU [timing]	5277	5277	684406	129.6960394163
DerivO3CPU [detailed]	5077	5276	35260	6.945046
MinorCPU [minor]	5289	5289	60897	11.513897

## Ex 3 - automotive benchmarks with DerivO3CPU (Out-of-Order)

HELLO WORLD SIMULATION	Instr simulated	Instr committed	CPU CC	CPI [CC/instr comm]
AtomicSimpleCPU [atomic]	5277	5277	5307	1.0056850483
TimingSimpleCPU [timing]	5277	5277	684406	129.6960394163
DerivO3CPU [detailed]	5077	5276	35260	6.945046
MinorCPU [minor]	5289	5289	60897	11.513897

Instruction percentages:

system.cpu.iq.FU_type_0::No_OpClass	1732	0.00%	0.00% # Type of FU issued
system.cpu.iq.FU_type_0::IntAlu	188891174	82.76%	82.76% # Type of FU issued
system.cpu.iq.FU_type_0::IntMult	2141730	0.94%	83.70% # Type of FU issued
system.cpu.iq.FU_type_0::IntDiv	0	0.00%	83.70% # Type of FU issued
system.cpu.iq.FU_type_0::FloatAdd	1887116	0.83%	84.53% # Type of FU issued
system.cpu.iq.FU_type_0::FloatCmp	202508	0.09%	84.62% # Type of FU issued
system.cpu.iq.FU_type_0::FloatCvt	408342	0.18%	84.80% # Type of FU issued
system.cpu.iq.FU_type_0::FloatMult	602988	0.26%	85.06% # Type of FU issued
system.cpu.iq.FU_type_0::FloatDiv	57737	0.03%	85.09% # Type of FU issued
system.cpu.iq.FU_type_0::FloatSqrt	19026	0.01%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdAdd	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdAddAcc	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdAlu	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdCmp	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdCvt	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdMisc	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdMult	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdMultAcc	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdShift	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdShiftAcc	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdSqrt	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatAdd	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatAlu	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatCmp	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatCvt	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatDiv	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatMisc	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatMult	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatMultAcc	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatSqrt	0	0.00%	85.10% # Type of FU issued
system.cpu.iq.FU_type_0::MemRead	20584302	9.02%	94.11% # Type of FU issued
system.cpu.iq.FU_type_0::MemWrite	13432648	5.89%	100.00% # Type of FU issued
system.cpu.iq.FU_type_0::IprAccess	0	0.00%	100.00% # Type of FU issued
system.cpu.iq.FU_type_0::InstPrefetch	0	0.00%	100.00% # Type of FU issued
system.cpu.iq.FU_type_0::total	228229303		# Type of FU issued

- Basicmath



	system.cpu.iq.FU_type_0::No_OpClass	45	0.00%	0.00%	# Type of FU issued
	system.cpu.iq.FU_type_0::IntAlu	4809933	95.92%	95.92%	# Type of FU issued
	system.cpu.iq.FU_type_0::IntMult	299	0.01%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::IntDiv	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatAdd	132	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatCmp	36	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatCvt	88	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatMult	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatDiv	23	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatSqrt	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdAdd	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdAddAcc	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdAlu	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdCmp	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdCvt	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdMisc	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdMult	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdMultAcc	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdShift	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdShiftAcc	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdSqrt	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatAdd	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatAlu	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatCmp	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatCvt	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatDiv	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatMisc	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatMult	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatMultAcc	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatSqrt	0	0.00%	95.93%	# Type of FU issued
	system.cpu.iq.FU_type_0::MemRead	195707	3.90%	99.83%	# Type of FU issued
	system.cpu.iq.FU_type_0::MemWrite	8275	0.17%	100.00%	# Type of FU issued
	system.cpu.iq.FU_type_0::IprAccess	0	0.00%	100.00%	# Type of FU issued
	system.cpu.iq.FU_type_0::InstPrefetch	0	0.00%	100.00%	# Type of FU issued
• Bitcount	system.cpu.iq.FU_type_0::total	5014538			# Type of FU issued
	system.cpu.iq.FU_type_0::No_OpClass	14	0.00%	0.00%	# Type of FU issued
	system.cpu.iq.FU_type_0::IntAlu	23971447	59.48%	59.48%	# Type of FU issued
	system.cpu.iq.FU_type_0::IntMult	34456	0.09%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::IntDiv	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatAdd	27	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatCmp	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatCvt	17	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatMult	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatDiv	5	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::FloatSqrt	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdAdd	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdAddAcc	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdAlu	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdCmp	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdCvt	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdMisc	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdMult	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdMultAcc	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdShift	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdShiftAcc	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdSqrt	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatAdd	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatAlu	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatCmp	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatCvt	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatDiv	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatMisc	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatMult	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatMultAcc	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::SimdFloatSqrt	0	0.00%	59.57%	# Type of FU issued
	system.cpu.iq.FU_type_0::MemRead	9421771	23.38%	82.95%	# Type of FU issued
	system.cpu.iq.FU_type_0::MemWrite	6873324	17.05%	100.00%	# Type of FU issued
	system.cpu.iq.FU_type_0::IprAccess	0	0.00%	100.00%	# Type of FU issued
	system.cpu.iq.FU_type_0::InstPrefetch	0	0.00%	100.00%	# Type of FU issued
• Quick Sort	system.cpu.iq.FU_type_0::total	40301061			# Type of FU issued



system.cpu.iq.FU_type_0::No_OpClass	14447	0.06%	0.06%	# Type of FU issued
system.cpu.iq.FU_type_0::IntAlu	14871846	63.27%	63.33%	# Type of FU issued
system.cpu.iq.FU_type_0::IntMult	3265675	13.89%	77.22%	# Type of FU issued
system.cpu.iq.FU_type_0::IntDiv	0	0.00%	77.22%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatAdd	60036	0.26%	77.48%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatCmp	2219	0.01%	77.49%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatCvt	26852	0.11%	77.60%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatMult	11588	0.05%	77.65%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatDiv	7961	0.03%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatSqrt	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdAdd	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdAddAcc	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdAlu	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdCmp	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdCvt	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdMisc	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdMult	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdMultAcc	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdShift	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdShiftAcc	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdSqrt	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatAdd	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatAlu	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatCmp	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatCvt	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatDiv	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatMisc	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatMult	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatMultAcc	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::SimdFloatSqrt	0	0.00%	77.68%	# Type of FU issued
system.cpu.iq.FU_type_0::MemRead	5197583	22.11%	99.79%	# Type of FU issued
system.cpu.iq.FU_type_0::MemWrite	48553	0.21%	100.00%	# Type of FU issued
system.cpu.iq.FU_type_0::IprAccess	0	0.00%	100.00%	# Type of FU issued
system.cpu.iq.FU_type_0::InstPrefetch	0	0.00%	100.00%	# Type of FU issued
system.cpu.iq.FU_type_0::total	23506760			# Type of FU issued

- Susan

#### Pipeline Stages activity:

- Basicmath

##### Fetch:

system.cpu.fetch.Insts	249665562	# Number of instructions fetch has proces
system.cpu.fetch.Branches	29917834	# Number of branches that fetch encounter
system.cpu.fetch.predictedBranches	21146703	# Number of branches that fetch has predi
system.cpu.fetch.Cycles	65540324	# Number of cycles fetch has run and was
system.cpu.fetch.SquashCycles	2063775	# Number of cycles fetch has spent squash

##### Decode:

system.cpu.decode.IdleCycles	71055965	# Number of cycles decode is idle
system.cpu.decode.BlockedCycles	34485749	# Number of cycles decode is blocked
system.cpu.decode.RunCycles	33897072	# Number of cycles decode is running
system.cpu.decode.UnblockCycles	9501069	# Number of cycles decode is unblocking
system.cpu.decode.SquashCycles	844543	# Number of cycles decode is squashing
system.cpu.decode.BranchResolved	5532395	# Number of times decode resolved a branc
system.cpu.decode.BranchMispred	187385	# Number of times decode detected a branc
system.cpu.decode.DecodedInsts	240315050	# Number of instructions handled by decoc
system.cpu.decode.SquashedInsts	434580	# Number of squashed instructions handlec

##### Rename:

system.cpu.rename.serializeStallCycles	12713030	# count of cycles rename stalled for seri
system.cpu.rename.RunCycles	39868981	# Number of cycles rename is running
system.cpu.rename.UnblockCycles	21224731	# Number of cycles rename is unblocking
system.cpu.rename.RenamedInsts	238080307	# Number of instructions processed by rer
system.cpu.rename.ROBFullEvents	65	# Number of times rename has blocked due
system.cpu.rename.IQFullEvents	19590353	# Number of times rename has blocked due
system.cpu.rename.LQFullEvents	244	# Number of times rename has blocked due
system.cpu.rename.SQFullEvents	563	# Number of times rename has blocked due

##### Issue:

system.cpu.iq.iqInstsIssued	228229303	# Number of instructions issued
system.cpu.iq.fu_full::No_OpClass	0	0.00% 0.00% # attempts to use FU when none available
system.cpu.iq.fu_full::IntAlu	857438	33.43% 33.43% # attempts to use FU when none available
system.cpu.iq.fu_full::IntMult	495397	19.32% 52.75% # attempts to use FU when none available
system.cpu.iq.fu_full::IntDiv	0	0.00% 52.75% # attempts to use FU when none available
system.cpu.iq.fu_full::FloatAdd	936	0.04% 52.78% # attempts to use FU when none available
system.cpu.iq.fu_full::FloatCmp	12	0.00% 52.78% # attempts to use FU when none available
system.cpu.iq.fu_full::FloatCvt	0	0.00% 52.78% # attempts to use FU when none available
system.cpu.iq.fu_full::FloatMult	3335	0.13% 52.91% # attempts to use FU when none available
system.cpu.iq.FU_type_0::No_OpClass	1732	0.00% 0.00% # Type of FU issued
system.cpu.iq.FU_type_0::IntAlu	188891174	82.76% 82.76% # Type of FU issued
system.cpu.iq.FU_type_0::IntMult	2141730	0.94% 83.70% # Type of FU issued
system.cpu.iq.FU_type_0::IntDiv	0	0.00% 83.70% # Type of FU issued
system.cpu.iq.FU_type_0::FloatAdd	1887116	0.83% 84.53% # Type of FU issued
system.cpu.iq.FU_type_0::FloatCmp	202508	0.09% 84.62% # Type of FU issued

system.cpu.iq.FU_type_0::FloatCvt	408342	0.18%	84.80%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatMult	602988	0.26%	85.06%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatDiv	57737	0.03%	85.09%	# Type of FU issued
system.cpu.iq.FU_type_0::FloatSqrt	19026	0.01%	85.10%	# Type of FU issued
system.cpu.iq.FU_type_0::MemRead	20584302	9.02%	94.11%	# Type of FU issued
system.cpu.iq.FU_type_0::MemWrite	13432648	5.89%	100.00%	# Type of FU issued
Execute:				
system.cpu.iew.lsq.thread0.forwLoads	832147			# Number of loads that had data forwarded
system.cpu.iew.lsq.thread0.invAddrLoads	0			# Number of loads ignored due to an invalid
system.cpu.iew.iewDispatchedInsts	236004227			# Number of instructions dispatched to IQ
system.cpu.iew.exec_rate	0.745006			# Inst execution rate
system.cpu.iew.wb_rate	0.743859			# insts written-back per cycle
Commit:				
system.cpu.commit.branchMispredicts	841640			# The number of times a branch was mispredicted
system.cpu.commit.committedInsts	228103859			# Number of instructions committed
system.cpu.commit.refs	32653304			# Number of memory references committed
system.cpu.commit.loads	19560362			# Number of loads committed
system.cpu.commit.membars	115466			# Number of memory barriers committed
system.cpu.commit.branches	27029484			# Number of branches committed
system.cpu.commit.fp_insts	4603332			# Number of committed floating point insts
system.cpu.commit.int_insts	216359787			# Number of committed integer instructions
system.cpu.commit.function_calls	2432739			# Number of function calls committed
system.cpu.commit.op_class_0::No_OpClass	5230603	2.29%	2.29%	# Class of committed instruction
system.cpu.commit.op_class_0::IntAlu	184816092	81.02%	83.32%	# Class of committed instruction
system.cpu.commit.op_class_0::IntMult	2140284	0.94%	84.25%	# Class of committed instruction
system.cpu.commit.op_class_0::MemRead	19675828	8.63%	94.26%	# Class of committed instruction
system.cpu.commit.op_class_0::MemWrite	13092943	5.74%	100.00%	# Class of committed instruction

## • Bitcount

Fetch:				
system.cpu.fetch.Insts	5916701			# Number of instructions fetched
system.cpu.fetch.Branches	841522			# Number of branches that were fetched
system.cpu.fetch.predictedBranches	803768			# Number of branches that were predicted
system.cpu.fetch.Cycles	1238842			# Number of cycles fetched
system.cpu.fetch.branchRate	0.546348			# Number of branch fetches per cycle
system.cpu.fetch.rate	3.841348			# Number of inst fetches per cycle
Decode:				
system.cpu.decode.BranchResolved	2430			# Number of times decode resolved a branch
system.cpu.decode.BranchMispred	345			# Number of times decode detected a branch
system.cpu.decode.DecodedInsts	5668856			# Number of instructions handled by decoder
Rename:				
system.cpu.rename.ROBFullEvents	11			# Number of times rename has blocked due to ROB full
system.cpu.rename.IQFullEvents	53995			# Number of times rename has blocked due to IQ full
system.cpu.rename.LQFullEvents	125			# Number of times rename has blocked due to LQ full
system.cpu.rename.SQFullEvents	550			# Number of times rename has blocked due to SQ full
Issue:				
system.cpu.iq.issued_per_cycle::total	1467268			# Number of insts issued each cycle
system.cpu.iq.fu_full::No_OpClass	0	0.00%	0.00%	# attempts to use FU when none available
system.cpu.iq.fu_full::IntAlu	68576	98.43%	98.43%	# attempts to use FU when none available
system.cpu.iq.FU_type_0::IntAlu	4809933	95.92%	95.92%	# Type of FU issued
system.cpu.iq.rate	3.255629			# Inst issue rate
Execute:				
system.cpu.iew.exec_swp	0			# number of swp insts executed
system.cpu.iew.exec_nop	33531			# number of nop insts executed
system.cpu.iew.exec_refs	203375			# number of memory reference insts executed
system.cpu.iew.exec_branches	615687			# Number of branches executed
system.cpu.iew.exec_stores	8143			# Number of stores executed
system.cpu.iew.exec_rate	3.236406			# Inst execution rate
system.cpu.iew.wb_sent	4984260			# cumulative count of insts sent to commit
system.cpu.iew.wb_count	4983951			# cumulative count of insts written-back
Commit:				
system.cpu.commit.swp_count	0			# Number of s/w prefetches committed
system.cpu.commit.refs	200454			# Number of memory references committed
system.cpu.commit.loads	193000			# Number of loads committed
system.cpu.commit.membars	44			# Number of memory barriers committed
system.cpu.commit.branches	593393			# Number of branches committed
system.cpu.commit.fp_insts	500			# Number of committed floating point insts

system.cpu.commit.int_insts	4671246			# Number of committed integer instruction
system.cpu.commit.function_calls	53566			# Number of function calls committed.
system.cpu.commit.op_class_0::No_OpClass	31952	0.68%	0.68%	# Class of committed instruction
system.cpu.commit.op_class_0::IntAlu	4471304	95.05%	95.73%	# Class of committed instruction

## • Quick Sort

Fetch:				
system.cpu.fetch.Insts	47243188			# Number of instructions fetch has proces
system.cpu.fetch.Branches	6583970			# Number of branches that fetch encounter
system.cpu.fetch.predictedBranches	4597936			# Number of branches that fetch has predi
system.cpu.fetch.rate	1.478022			# Number of inst fetches per cycle
Decode:				
system.cpu.decode.BranchResolved	1240743			# Number of times decode resolved a branc
system.cpu.decode.BranchMispred	423			# Number of times decode detected a branc
system.cpu.decode.DecodedInsts	46205413			# Number of instructions handled by decoc
Rename:				
system.cpu.rename.ROBFullEvents	87234			# Number of times rename has blocked due
system.cpu.rename.IQFullEvents	1220098			# Number of times rename has blocked due
system.cpu.rename.LQFullEvents	893423			# Number of times rename has blocked due
system.cpu.rename.SQFullEvents	8990636			# Number of times rename has blocked due
Issue:				
system.cpu.iq.issued_per_cycle::total	31909108			# Number of insts issued each cycle
system.cpu.iq.fu_full::No_OpClass	0	0.00%	0.00%	# attempts to use FU when none available
system.cpu.iq.fu_full::IntAlu	118981	10.97%	10.97%	# attempts to use FU when none available
system.cpu.iq.fu_full::MemRead	656250	60.51%	71.48%	# attempts to use FU when none available
system.cpu.iq.fu_full::MemWrite	309379	28.52%	100.00%	# attempts to use FU when none available
Execute:				
system.cpu.iew.exec_swp	0			# number of swp insts executed
system.cpu.iew.exec_nop	4972758			# number of nop insts executed
system.cpu.iew.exec_refs	16190534			# number of memory reference insts execut
system.cpu.iew.exec_branches	6083417			# Number of branches executed
system.cpu.iew.exec_stores	6848559			# Number of stores executed
system.cpu.iew.exec_rate	1.254399			# Inst execution rate
system.cpu.iew.wb_sent	39010149			# cumulative count of insts sent to commi
system.cpu.iew.wb_count	38930685			# cumulative count of insts written-back
Commit:				
system.cpu.commit.op_class_0::No_OpClass	4614040	11.32%	11.32%	# Class of committed instruction
system.cpu.commit.op_class_0::IntAlu	21668949	53.17%	64.49%	# Class of committed instruction
system.cpu.commit.op_class_0::MemRead	7965644	19.55%	84.10%	# Class of committed instruction
system.cpu.commit.op_class_0::MemWrite	6481609	15.90%	100.00%	# Class of committed instruction

## • Susan

Fetch:				
system.cpu.fetch.Insts	29742040			# Number of instructions fetch has proces
system.cpu.fetch.Branches	2361956			# Number of branches that fetch encounter
system.cpu.fetch.predictedBranches	2224137			# Number of branches that fetch has predi
system.cpu.fetch.Cycles	5059289			# Number of cycles fetch has run and was
Decode:				
system.cpu.decode.BranchResolved	119326			# Number of times decode resolved a branc
system.cpu.decode.BranchMispred	349			# Number of times decode detected a branc
system.cpu.decode.DecodedInsts	27545070			# Number of instructions handled by decoc
Rename:				
system.cpu.rename.ROBFullEvents	2309			# Number of times rename has blocked due
system.cpu.rename.IQFullEvents	20507			# Number of times rename has blocked due
system.cpu.rename.LQFullEvents	122781			# Number of times rename has blocked due
system.cpu.rename.SQFullEvents	10360			# Number of times rename has blocked due
Issue:				
system.cpu.iq.issued_per_cycle::total	5613800			# Number of insts issued each cycle
system.cpu.iq.fu_full::No_OpClass	0	0.00%	0.00%	# attempts to use FU when none available
system.cpu.iq.fu_full::IntAlu	184	1.14%	1.14%	# attempts to use FU when none available
system.cpu.iq.fu_full::IntMult	14248	88.06%	89.20%	# attempts to use FU when none available
system.cpu.iq.FU_type_0::IntAlu	14871846	63.27%	63.33%	# Type of FU issued

system.cpu.iq.FU_type_0::IntMult	3265675	13.89%	77.22% # Type of FU issued
system.cpu.iq.FU_type_0::MemRead	5197583	22.11%	99.79% # Type of FU issued
system.cpu.iq.FU_type_0::MemWrite	48553	0.21%	100.00% # Type of FU issued
Execute:			
system.cpu.iew.exec_swp	0		# number of swp insts executed
system.cpu.iew.exec_nop	387139		# number of nop insts executed
system.cpu.iew.exec_refs	5029059		# number of memory reference insts execut
system.cpu.iew.exec_branches	1910719		# Number of branches executed
system.cpu.iew.exec_stores	48457		# Number of stores executed
system.cpu.iew.exec_rate	4.076695		# Inst execution rate
system.cpu.iew.wb_sent	23062952		# cumulative count of insts sent to commi
system.cpu.iew.wb_count	23061510		# cumulative count of insts written-back
Commit:			
system.cpu.commit.op_class_0::IntAlu	14175683	61.80%	63.45% # Class of committed instruction
system.cpu.commit.op_class_0::IntMult	3265440	14.24%	77.69% # Class of committed instruction
system.cpu.commit.op_class_0::MemRead	4962871	21.64%	99.80% # Class of committed instruction
system.cpu.commit.op_class_0::MemWrite	46827	0.20%	100.00% # Class of committed instruction

