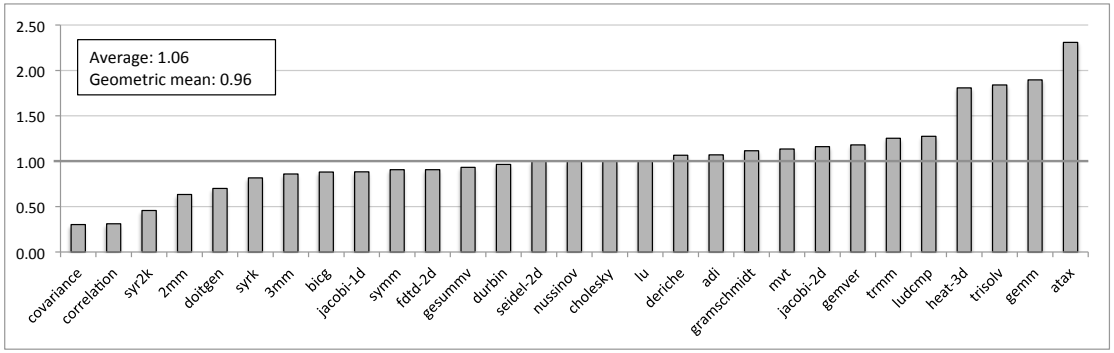
ISL checks vs. clean Polly

GOAL: show how ISL checks improve Polly
BASE: llvm -O3 + new version of Polly
OPT: same as base adding ISL alias checks

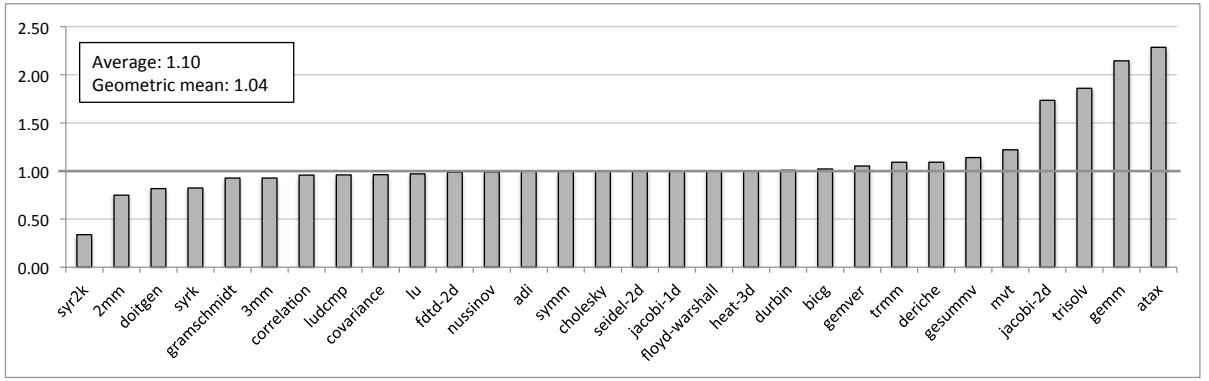
benchmark	base	opt	opt/base
covariance	4.286375667	1.292744833	0.30
correlation	4.130591	1.282075667	0.31
syr2k	7.407461167	3.3864675	0.46
2mm	3.287836833	2.081530833	0.63
doitgen	0.843218333	0.589563333	0.70
syrk	1.114076167	0.909278	0.82
3mm	4.953685333	4.253116833	0.86
bicg	0.015091833	0.013307	0.88
jacobi-1d	0.001729667	0.0015275	0.88
symm	3.044298667	2.758951167	0.91
fdtd-2d	3.130122	2.8374945	0.91
gesummv	0.006505167	0.006063833	0.93
durbin	0.0042945	0.004142	0.96
seidel-2d	31.7187355	31.71568883	1.00
nussinov	4.935784167	4.942005833	1.00
cholesky	1.7688855	1.773232333	1.00
lu	9.000601167	9.047724667	1.01
deriche	0.232074	0.247245167	1.07
adi	21.59016883	23.08466767	1.07
gramschmidt	8.258112	9.2100685	1.12
mvt	0.017446333	0.019809167	1.14
jacobi-2d	3.0170135	3.5037535	1.16
gemver	0.0247495	0.029206	1.18
trmm	1.2334145	1.545431	1.25
ludcmp	4.4385885	5.654569167	1.27
heat-3d	4.612748833	8.341796333	1.81
trisolv	0.002904167	0.005346833	1.84
gemm	0.887907833	1.683137667	1.90
atax	0.008417167	0.019431833	2.31



SCEV checks vs. clean Polly

GOAL: show how SCEV checks improve Polly
BASE: llvm -O3 + old version of Polly
OPT: same as base plus SCEV alias checks

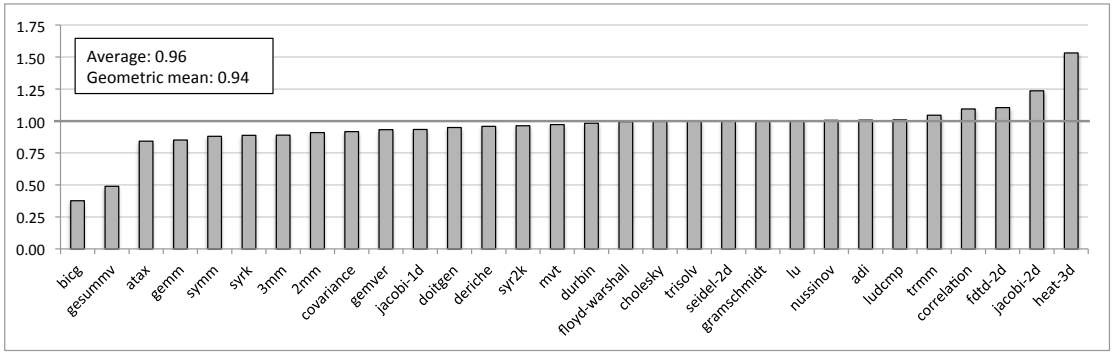
benchmark	base	opt	opt/base
syr2k	7.915418333	2.671141667	0.34
2mm	3.305413333	2.477566167	0.75
doitgen	0.837505333	0.683899167	0.82
syrk	1.090688333	0.897848333	0.82
gramschmidt	5.560098667	5.145542	0.93
3mm	4.624393333	4.281411167	0.93
correlation	3.863947667	3.702578667	0.96
ludcmp	4.5316565	4.3435605	0.96
covariance	4.028980167	3.8727905	0.96
lu	5.2506245	5.098458667	0.97
fdtd-2d	3.173447333	3.1331675	0.99
nussinov	4.014873833	3.976555833	0.99
adi	23.96234133	23.882095	1.00
symm	2.958127	2.9487755	1.00
cholesky	1.763446833	1.7602835	1.00
seidel-2d	32.83572133	32.83416	1.00
jacobi-1d	0.001695833	0.001697833	1.00
floyd-warshall	27.809084	27.84690767	1.00
heat-3d	4.617384333	4.625200333	1.00
durbin	0.004442667	0.004481333	1.01
bicg	0.01511	0.015437667	1.02
gemver	0.025373	0.026704167	1.05
trmm	1.211482167	1.321353167	1.09
deriche	0.242455833	0.264599667	1.09
gesummv	0.006498333	0.007399	1.14
mvt	0.017265	0.0210715	1.22
jacobi-2d	3.120814	5.410435	1.73
trisolv	0.002892833	0.005379167	1.86
gemm	0.892556	1.914641333	2.15
atax	0.008421167	0.019246667	2.29



SCEV checks vs. clean LLVM -O3

GOAL: show how SCEV checks improve classic LLVM optimizations
BASE: llvm -O3 + Polly code preparation passes (no Polly optimizations)
OPT: same as base adding SCEV alias checks and scoped alias tags

benchmark	base	opt	opt/base
bicg	0.0151	0.005677	0.38
gesummv	0.006510833	0.003186333	0.49
atax	0.008427333	0.007093167	0.84
gemm	0.889299667	0.756746833	0.85
symm	2.968735167	2.615151167	0.88
syrk	1.098869	0.9751995	0.89
3mm	4.629935667	4.1153645	0.89
2mm	2.818680833	2.561066667	0.91
covariance	4.097806833	3.754756667	0.92
gemver	0.025167667	0.023455667	0.93
jacobi-1d	0.0017065	0.001594333	0.93
doitgen	0.843032167	0.799663667	0.95
deriche	0.244665167	0.234473667	0.96
syr2k	8.508015667	8.1915315	0.96
mvt	0.017436333	0.0169445	0.97
durbin	0.0046655	0.0045865	0.98
floyd-warshall	27.83473933	27.67391983	0.99
cholesky	1.7747535	1.768403	1.00
trisolv	0.002893167	0.00289	1.00
seidel-2d	32.81843533	32.81834767	1.00
gramschmidt	6.884038	6.884594	1.00
lu	5.152022333	5.1601845	1.00
nussinov	4.018951333	4.041663667	1.01
adi	23.79492367	23.97718933	1.01
ludcmp	4.419431833	4.459738833	1.01
trmm	1.269564333	1.327268167	1.05
correlation	3.5955015	3.934883667	1.09
fdtd-2d	3.1452	3.473257167	1.10
jacobi-2d	3.113707	3.84663	1.24
heat-3d	4.6175905	7.075862	1.53



ISL checks vc. "restrict" keyword

GOAL: show how close ISL checks are from perfect alias info (restrict flags)
BASE: llvm -O3 + new version of Polly + PolyBench 4.0 restrict flag
OPT: llvm -O3 + new version of Polly + ISL alias checks

benchmark	base	opt	opt/base
bicg	0.0133735	0.012482	0.93
syrk	0.945792833	0.907370167	0.96
fdtd-2d	2.931477	2.836864667	0.97
lu	9.217043333	9.0783045	0.98
gemver	0.032021167	0.0316235	0.99
atax	0.019945167	0.019716833	0.99
trisolv	0.005394667	0.005338333	0.99
nussinov	4.9403785	4.900219333	0.99
2mm	2.099722167	2.084903167	0.99
gemm	1.693364	1.682386	0.99
gesummv	0.006111167	0.006085167	1.00
seidel-2d	31.79625767	31.71726133	1.00
adi	23.10655	23.05347867	1.00
cholesky	1.773596333	1.772550333	1.00
correlation	1.282573333	1.281836167	1.00
trmm	1.544563833	1.545641333	1.00
heat-3d	8.191995333	8.264707333	1.01
covariance	1.278394833	1.2913715	1.01
jacobi-2d	3.4664955	3.502626667	1.01
deriche	0.244437667	0.247467833	1.01
mvt	0.019665	0.019987167	1.02
syr2k	3.323502667	3.38947	1.02
symm	2.558214167	2.612137167	1.02
durbin	0.004403833	0.0045695	1.04
doitgen	0.529183167	0.589973	1.11
jacobi-1d	0.001396667	0.0015905	1.14
ludcmp	4.504974167	5.657394667	1.26
3mm	3.172263833	4.3632535	1.38
gramschmidt	5.189814167	7.864942833	1.52