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FILE MEMO

SUBJECT: Distribution of Operation Classes in Sample Programs used in SIGMA Timing Simulator

The definition of what composes a "typical scientific problem" is a subject which can invoke endless debate. One of the chief reasons why statements on this subject can be challanged is that most past experience has been on machines which do not have the same operation codes as SIGMA. There can also be considerable changes in the overall laying-out of problems in a computer such as SIGMA over older smaller machines which will influence the distribution of operations used; Be that as it may, here are the distributions of operation classes in the problems actually being used in the SIGMA timing simulator.

	Percentages of Orders Executed				
Problem Name	Unconditional Branches	Indicator Branches	Index Modification and Branching	Floating Point	VFL
1. Mesh Calculation	0	0	14. %	85. %	1. %
2. Monte Carlo Branching	12. %	24. %	15. %	47. %	2. %
3. Transac test problem	0	13. %	10. %	71. %	6. %
4. Matrix inversion	0	0	33. %	67. %	0
5. Westinghouse Reactor problem	0	0	10. %	90. %	0

The first two have been used most heavily.

Within the floating point set the following statistics exist: (Floating Compares, Add exponents, etc., are lumped with Fl Adds)

	Percentage of Floating orders executed			
Problem Name	Fl Loads and Stores	Fl Add	Fl Mpys	Fl Divs
1. Mesh Calculation	56. %	26. %	14. %	4. %
2. Monte Carlo branching	54. %	43. %	3. %	0. %
3. Transac Test problem	27. %	46. %	18. %	9. %
4. Matrix inversion	50. %	25. %	25. %	0
5. Westinghouse Reactor problem	39. %	22. %	39. %	0
Averages =	45. %	32. %	20. %	3. %
"Standard" 6-6-3-1 Ratio =	37. 5%	37. 5%	18. 8%	6. 2%

The main conclusion one can draw from the above is that the "Standard" ratio may be allright as an average but there are large variations away from it in individual "typical" problems.

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