

**NC State University**  
**Department of Electrical and Computer Engineering**  
**ECE 463/521: Spring 2014**  
**Project #3: Dynamic Instruction Scheduling**

**by**

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(sign by typing your name)

Course number: 521

## ANALYSIS OF GIVEN BENCHMARKS

### a) VAL\_GCC\_TRACE\_MEM

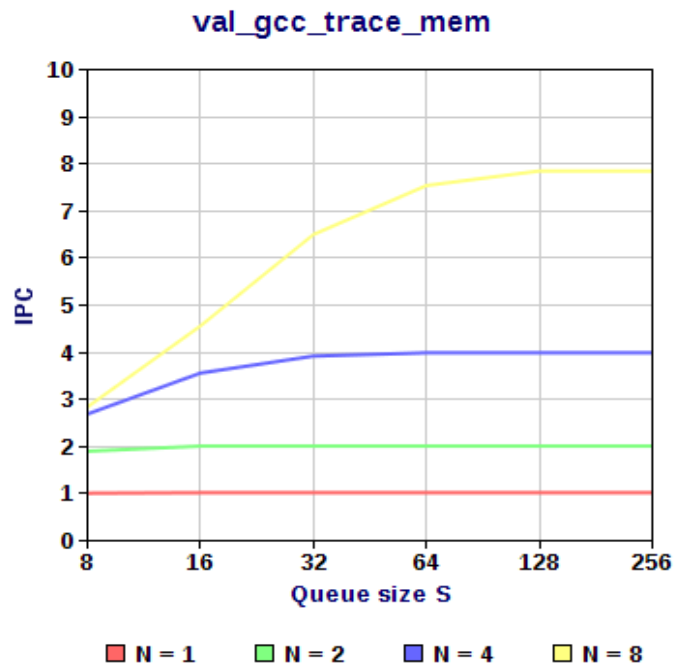
N =1	
S	IPC
8	0.99
16	1
32	1
64	1
128	1
256	1

N =2	
S	IPC
8	1.88
16	1.99
32	1.99
64	1.99
128	1.99
256	1.99

N =4	
S	IPC
8	2.67
16	3.54
32	3.90
64	3.97
128	3.97
256	3.97

N = 8	
S	IPC
8	2.82
16	4.54
32	6.48
64	7.52
128	7.83
256	7.83

**Graph of the observations with different N values**



### Observations on the trend

We can see that as the queue size increases, the value of IPC starts to get hit the saturation level of N and we get diminishing returns. The IPC value increases in a gradual manner. Thus, we can say that the value of S and N have similar effects on IPC.

One difference that can be noted between increasing S and N is that when S is kept constant and N is increased, the IPC keeps increasing, however when N is kept constant and S is increased, the IPC reaches a saturation point beyond which we get diminishing returns.

**b) VAL\_PERL\_TRACE\_MEM**

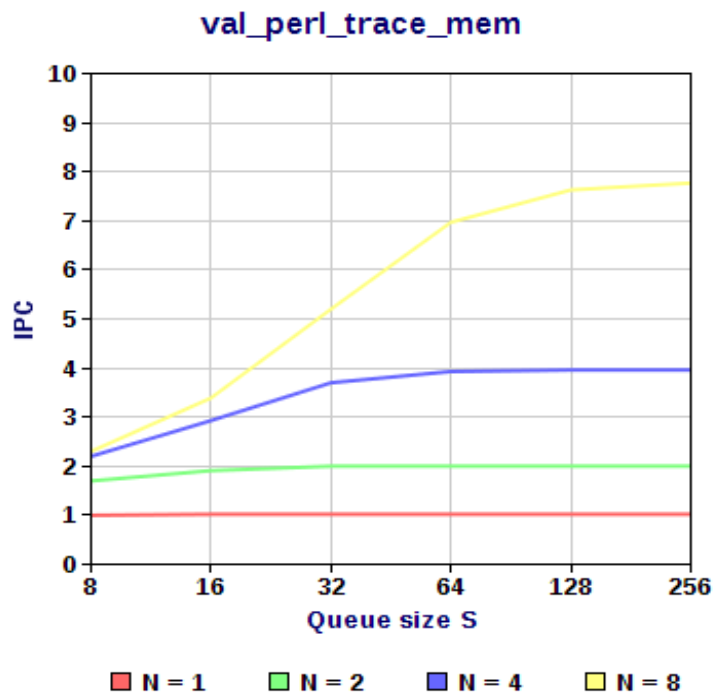
N =1	
S	IPC
8	0.98
16	1
32	1
64	1
128	1
256	1

N =2	
S	IPC
8	1.68
16	1.89
32	1.98
64	1.98
128	1.98
256	1.98

N =4	
S	IPC
8	2.18
16	2.91
32	3.68
64	3.91
128	3.94
256	3.94

N = 8	
S	IPC
8	2.28
16	3.37
32	5.18
64	6.95
128	7.61
256	7.75

**Graph of the observations with different N values**



### Observations on the trend

We can see that as the queue size S increases, the IPC reaches a saturation point very close to N. The IPC increases gradually as the bandwidth of the instruction scheduler increases. Thus, we can say that the value of S and N have similar effects on IPC.

The variations in the value of IPC is very small at smaller values of the bandwidth. As the queue size S increases, the IPC starts getting to a constant value for higher bandwidth of the instruction scheduler. Thus, the IPC seems to depend on the configuration of the processor architecture rather than the given bench marks.