NC State University

Department of Electrical and Computer Engineering

ECE 463/521: Fall 2015 (Rotenberg)

Project #3: Dynamic Instruction Scheduling

by

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NCSU Honor Pledge: "I have neither given nor received unauthorized aid on this test or assignment."

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Course number: 521

Graph 1:

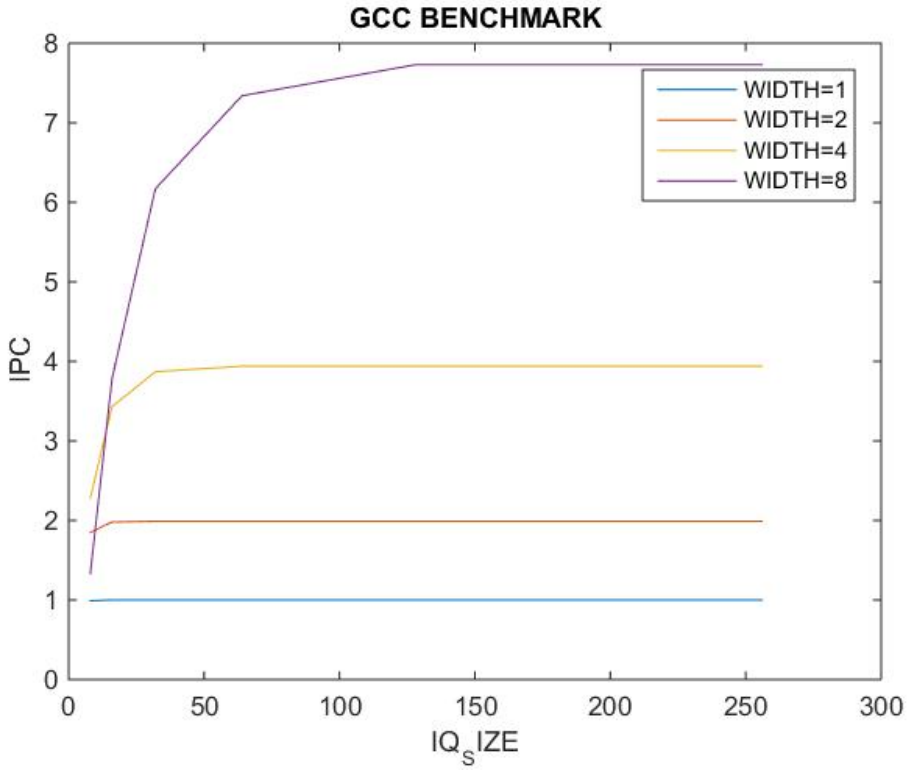

Table1:

IPC VALUES		GCC					
WIDTH/IQ_SIZE	8	16	32	64	128	256	Note
1	**0.99**	1	1	1	1	1	**Optimized IQ_SIZE IS 8**
2	1.85	**1.98**	1.99	1.99	1.99	1.99	**Optimized IQ_SIZE IS 16**
4	2.28	3.43	**3.87**	3.94	3.94	3.94	**Optimized IQ_SIZE IS 32**
8	1.33	3.78	6.17	7.34	**7.73**	7.73	**Optimized IQ_SIZE IS 128**

Graph Analysis: In bold in the table

Graph 2:

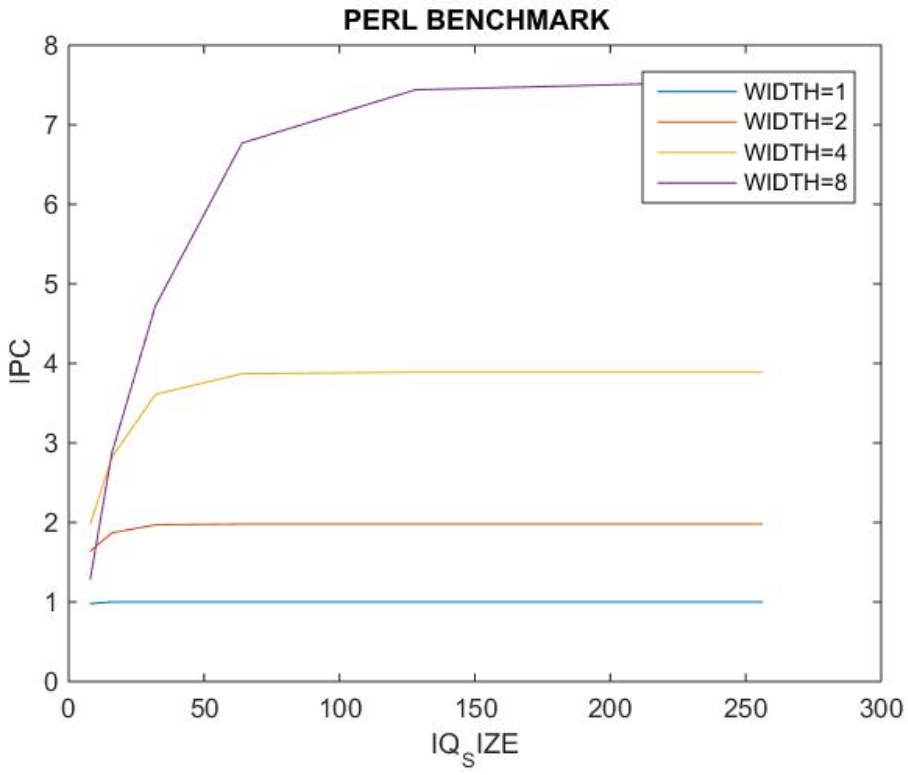

Table2:

IPC VALUES		PERL					
WIDTH/IQ_SIZE	8	16	32	64	128	256	Note
1	**0.98**	1	1	1	1	1	**Optimized IQ_SIZE IS 8**
2	1.64	1.87	**1.97**	1.98	1.98	1.98	**Optimized IQ_SIZE IS 32**
4	1.98	2.82	3.61	**3.87**	3.89	3.89	**Optimized IQ_SIZE IS 64**
8	1.29	2.88	4.72	6.77	**7.44**	7.55	**Optimized IQ_SIZE IS 128**

Graph Analysis: In bold in the table

DISCUSSION:

Clearly as IQ_SIZE increases, the IPC goes towards WIDTH. For lower width, higher IQ_SIZE is not really required or optimal.

There are some differences between the perl and gcc benchmark. This could be because of the number of dependent instructions in each benchmark, and the different amounts of time spent in execute.

Graph 3:

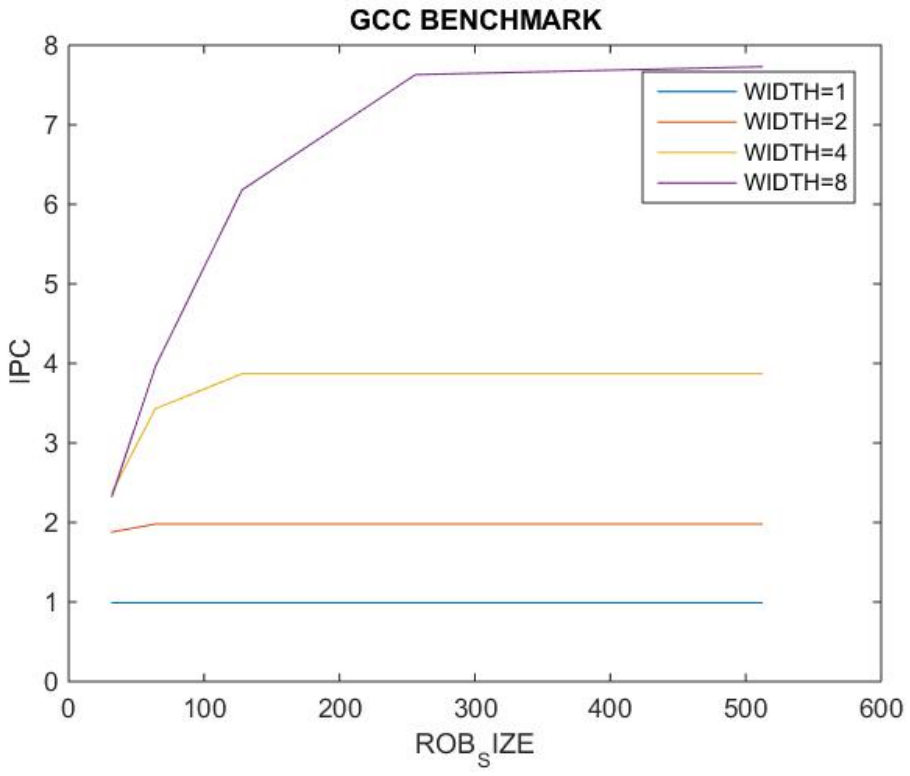

Table 3:

IPC VALUES		GCC						
WIDTH/ROB_SIZE	32	64	128	256	512		Note	
1	0.99	0.99	0.99	0.99	0.99		Optimized IQ_SIZE IS 8	
2	1.88	1.98	1.98	1.98	1.98		Optimized IQ_SIZE IS 16	
4	2.38	3.43	3.87	3.87	3.87		Optimized IQ_SIZE IS 32	
8	2.33	3.96	6.18	7.63	7.73		Optimized IQ_SIZE IS 128	

Graph Analysis: In bold in the table

Graph 4:

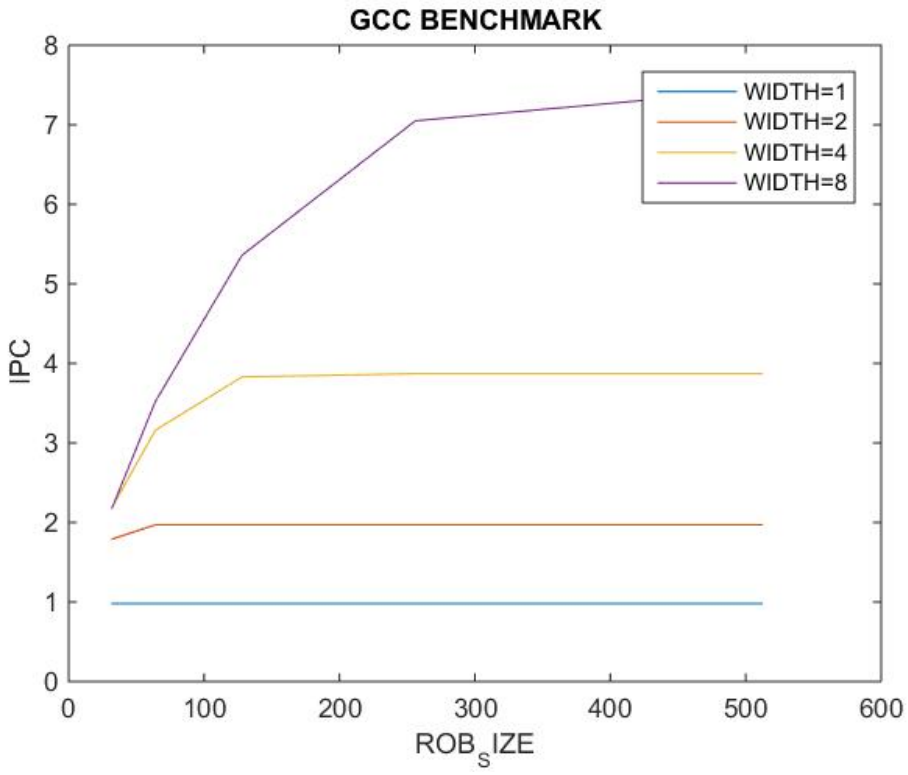

Table 4:

IPC VALUES		PERL					
WIDTH/ROB_SIZE	32	64	128	256	512		Note
1	0.98	0.98	0.98	0.98	0.98		**Optimized IQ_SIZE IS 8**
2	1.79	1.97	1.97	1.97	1.97		**Optimized IQ_SIZE IS 32**
4	2.19	3.16	3.83	3.87	3.87		**Optimized IQ_SIZE IS 64**
8	2.18	3.52	5.36	7.05	7.44		**Optimized IQ_SIZE IS 128**

Graph Analysis: In bold in the table