University of Central Florida

Department of Computer Science

CDA 5106: Fall 2020

Machine Problem 3: Dynamic Instruction Scheduling

by

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

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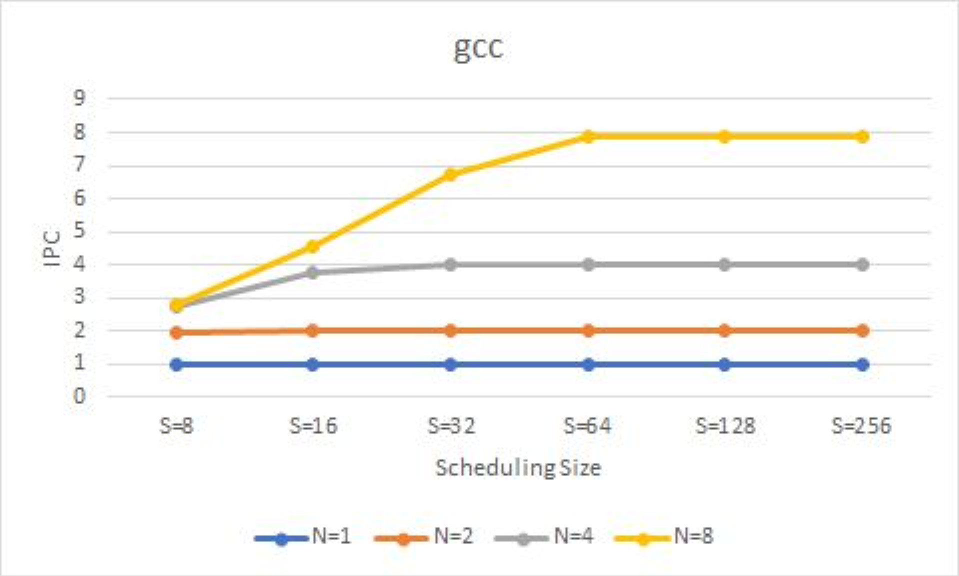
(sign by typing your name)

Sample cover page for MP3.

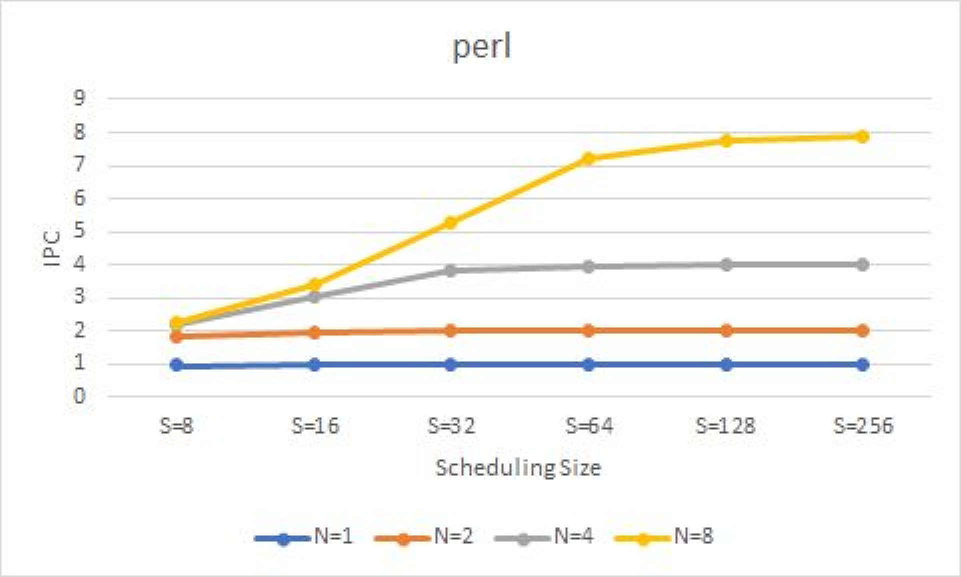
1) Graph 1: GCC BENCHMARK



S	N=1	N=2	N=4	N=8
S=8	0.9996	1.95771	2.73	2.82008
S=16	0.9996	1.9976	3.7594	4.57247
S=32	0.9996	1.9976	3.98406	6.72495
S=64	0.9996	1.9976	3.98406	7.85546
S=128	0.9996	1.9976	3.98406	7.88644
S=256	0.9996	1.9976	3.98406	7.88644

Graph 2: PERL BENCHMARK

Sample cover page for MP3.



S	N=1	N=2	N=4	N=8
S=8	0.9991	1.81127	2.20022	2.27635
S=16	0.9992	1.9755	3.06091	3.39443
S=32	0.9992	1.99481	3.83289	5.28821
S=64	0.9992	1.99561	3.95413	7.23589
S=128	0.9992	1.99561	3.97931	7.75194
S=256	0.9992	1.99561	3.97931	7.87402

2)

Optimized Scheduling Queue size per peak Fetch Rate		
	Benchmark = gcc	**Benchmark = perl**
N=1	8	8
N=2	16	32
N=4	32	64
N=8	128	128

Sample cover page for MP3.

3) Discussion:

A) In order to achieve IPC that is close to the peak fetch rate, size of scheduling queue should increase as N increases. As we can see from the graph of gcc benchmark, that for **S=256 and N=8**, the IPC was closer to the peak fetch rate. Similarly for the perl benchmark, IPC closer to the fetch rate was achieved when S and N were increased. S and N should be directly proportional to get IPC closer to peak fetch rate.

B) The IPC value of gcc benchmark is greater than the perl benchmark. The reason can be that the instructions in gcc benchmark have less dependency among them when compared to perl benchmark.