University of Central Florida

Department of Computer Science

CDA 5106: Fall 2020

Machine Problem 3: Dynamic Instruction Scheduling

by

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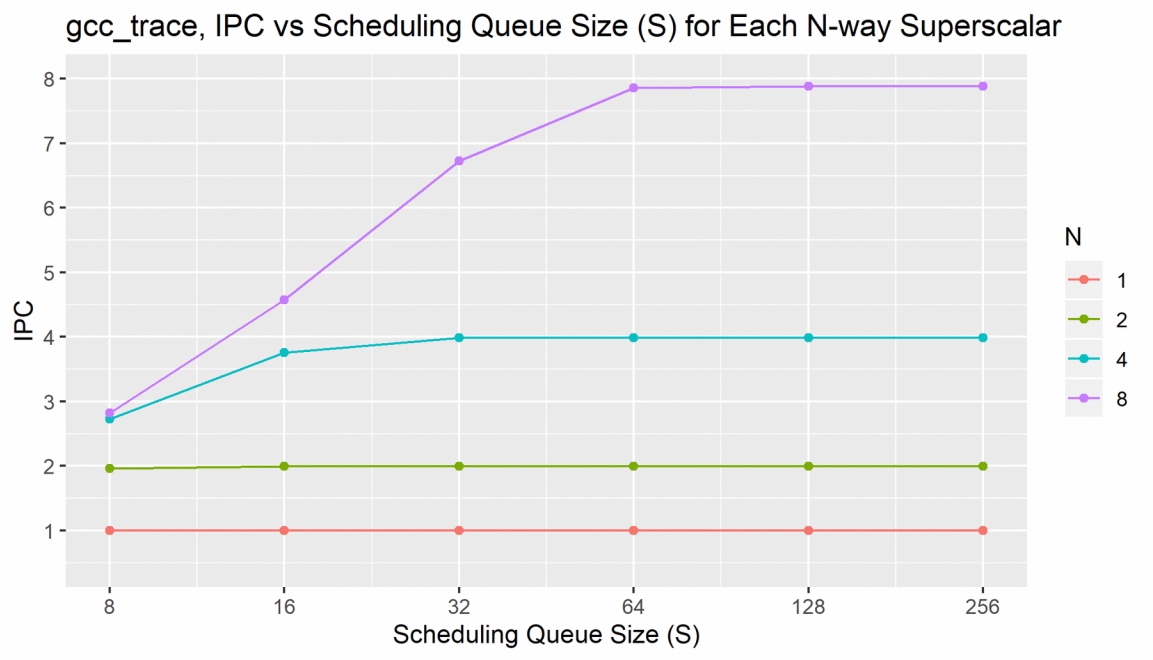
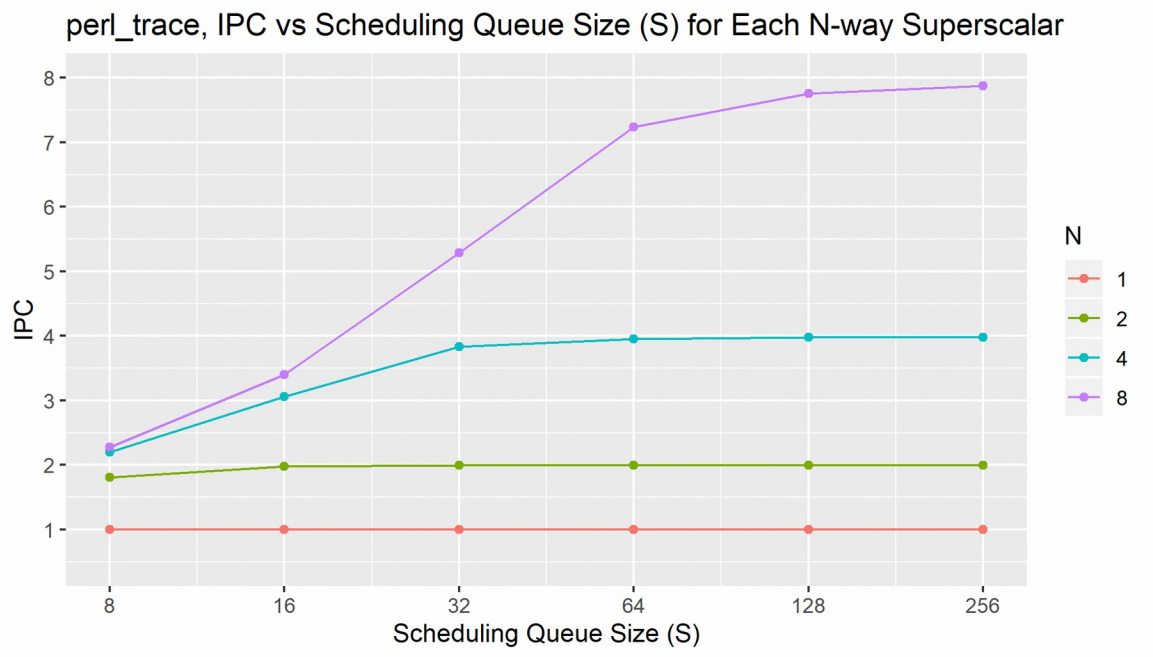
Honor Pledge: "I have neither given nor received unauthorized aid on this test or assignment."

Student's electronic signature: _____Ali Abbas_____
(sign by typing your name)

Part 1


gcc_trace, IPC vs Scheduling Queue Size (S) for Each N-way Superscalar
IPC
Scheduling Queue Size (S)
8
16
32
64
128
256
1
2
3
4
5
6
7
8
N
1
2
4
8


perl_trace, IPC vs Scheduling Queue Size (S) for Each N-way Superscalar
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Part 2

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

Part 3

A) In general, with lower values of N (1 and 2), increasing S has no effect in achieving higher IPC. Beyond that, increasing N, will make increasing S more beneficial by achieving higher IPC, but only up to a point beyond which increasing S has no significant effect, as we saw in previous table.

B) We achieved higher IPC with gcc trace, because it contains less true dependency between instructions and therefore less RAW hazards.