



- Courseware
- Course Info
- Discussion
- Wiki
- Progress
- Discussion Guidelines
- Resources
- Exploring Engineering
- Syllabus
- How to Use Jade

Help

MULTIPROGRAMMING AND MULTITHREADING

	3:26 / 3:26	1.0x			
--	-------------	------	--	--	--

Download transcript .txt

Show Discussion

New Post

THREAD-LEVEL PARALLELISM

Help

	4:10 / 4:10	1.0x			
--	-------------	------	--	--	--

Download transcript .txt

Show Discussion

 New Post

1. CHECK YOUR UNDERSTANDING (1/1 point)

In the video, the two-way multithreaded pipeline executed the following two threads:

Thread 1

LOOP ADD R1, R2, R3
NOT R4, R1
AND R5, R4, R3
ADD R6, R5, 2
BRz LOOP

Thread 2

ADD R7, R1, 0
ADD R4, R7, R2
AND R5, R4, 1
STR R5, R1, 0
ADD R1, R1, 0

How was the two-way multithreaded pipeline able to achieve higher throughput than the 2-way superscalar pipeline without multithreading?

Help

- ☐ Data dependences were completely removed from both programs.
- ☒ The hardware was able to pair one instruction from each thread to move through the pipeline together. ✓
- ☐ The compiler was able to reorder instructions to address data dependences.
- ☐ The two-way multithreaded pipeline did not require any forwarding of data.

EXPLANATION

The first answer is incorrect since the data dependences are still present in both threads.

The second answer is true. As we saw in the video, the hardware moved pairs of instructions, one from each thread, through the pipeline.

The compiler did not reorder instructions.

Forwarding was in fact performed within the pipeline. For instance, when the first instruction in each thread (the two ADDs) moved together into MEM, their results were forwarded into EX for the following NOT and ADD instructions.

Final Check

Save

Hide Answer

You have used 1 of 2 submissions[Show Discussion](#)[New Post](#)

EdX offers interactive online classes and MOOCs from the world's best universities. Online courses from MITx, HarvardX, BerkeleyX, UTX and many other universities. Topics include biology, business, chemistry, computer science, economics, finance, electronics, engineering, food and nutrition, history, humanities, law, literature, math, medicine, music, philosophy, physics, science, statistics and more. EdX is a non-profit online initiative created by founding partners Harvard and MIT.

© 2015 edX Inc.

EdX, Open edX, and the edX and Open edX logos are registered trademarks or trademarks of edX Inc.

About edX[About](#)[News](#)[Contact](#)[FAQ](#)[edX Blog](#)[Donate to edX](#)[Jobs at edX](#)**Follow Us**[Facebook](#)[Twitter](#)[LinkedIn](#)[Google+](#)[Tumblr](#)[Meetup](#)[Reddit](#)



Help