

Unit 14 - Week 12

Course outline

How to access the portal

Pre-Requisite Assignment

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Week 12

Parallel implementation of FIR filters

Unfolding Transformation

Lookahead Transformation

Introduction to GPUs and Matrix multiplication

Quiz : Assignment 12

Mapping Signal Processing Algorithms to Architectures : Week 12 Feedback

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Assignment 12

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-10-23, 23:59 IST.

1) It is not possible to make a parallel implementation of an IIR filter

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: If there are enough delays in the loop, unrolling and hence parallel implementations can be done

Accepted Answers:

False

2) After the serial to parallel converter in a parallel filter implementation, the computations need to run at a higher clock speed

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: Sample interval after S2P is higher, so more time is available

Accepted Answers:

False

3) The unfolding transformation for hardware dataflow graphs is similar to the unrolling of loops in software

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: True

Accepted Answers:

True

4) Unfolding can be used to change the iteration period bound of a dataflow graph

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: IPB is a fundamental property and cannot be changed without changing the algorithm itself in some way

Accepted Answers:

False

5) Unfolding is a special transformation applicable only to filters, not other types of DSP applications

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: It can be applied to any application that can be accurately represented by a dataflow graph

Accepted Answers:

False

6) Lookahead cannot be applied to purely feedforward networks like FIR filters

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: An example of lookahead in feedforward networks is the carry lookahead adder

Accepted Answers:

False

7) The lookahead transformation can be applied to any dataflow graph that has feedback connections

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: Lookahead uses some property like the underlying mathematics, and can only be applied in special cases.

Accepted Answers:

False

8) GPUs can only do fixed point computations

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: In fact, they usually specialize in floating point computation

Accepted Answers:

False

9) GPGPUs can compute with arbitrary precision fixed point numbers (for example Q13.7).

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: GPUs have fixed ALUs, and cannot change their numerical representations.

Accepted Answers:

False

10) FPGAs cannot be used to perform parallel matrix multiplication

1 point

- True
 False

No, the answer is incorrect.
Score: 0

Feedback:

Solution: The same approach used for GPUs can also be used for FPGAs

Accepted Answers:

False