PGT Exam Performance Feedback 2017/2018 Semester 2

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Comments

Ten students took the exam and each of the questions had at least one student achieving mull marks.

Question 1 (Questions concerning programming the ARM architecture)
The first question a) was following up programming exercises from the course work. Interestingly, the answers provided quite different solutions which all got full marks when working correctly. The second question b) on B versus BL was not solved by everybody despite that it is in the bookwork and despite that this is used all over the place during the coursework. The array initialisation in assembly was solved mostly well. However, only few students realised that the number of elements can be actually zero. The question about context switching d) was basically asking about the steps that students had to program for one assessed exercise. Therefore it was interesting that not only half the students performed well here. Also the steps asked for were listed on the additional course material slides. Similarly, the last question on accessing SWI parameters was part of the coursework and listed in the slides. And despite this, only half the students were able to solve this question.

Question 2 (Questions concerning heterogeneous computing)
This question was marked relatively generous in the sense that exact numbers are less important than sensible estimates. However, for full marks, students should state how many cycles trigonometric functions actually take. For example, using polynomial approximation or a look-up table. For the loop analysis c) it was not really relevant what compute substrate (ARM or FPGA) would be used but what dependencies exist that restrict exploiting parallelism. While the first inner loop has a dependency that requires sequential execution over all loops, the second inner loop is fully parallel. However, parallelism here makes only sense to the extend until the first loop gets the bottleneck. Answering this question does not need FPGA programming skills but an understanding of parallelism and computing models. For the last question e), all sensible answers were given marks. However, only about half the students tried this question. One better answer would have been to offload the complex trigonometric function to the ARM as that one is used only very seldom as compared to other functions.

Question 3 (Questions about memory, memory management, and cache)
This question is mostly bookwork. For question a), only half the students made it clear that cost, performance, capacity, and speed are only achievable using a memory hierarchy and that some objectives exclude each other. The question on the cache line size b) required understanding of the course material and about one third of the students were able to solve this question. As usual, how good a design decision on the memory hierarchy works, depends of course on the specific problem. For question e) on using disk storage as virtual memory, the "how" was asked for (from a system/OS perspective) and not what SSD is used in a student's computer. The last question f) on the protection unit was basically assessing the understanding of bookwork material, but only about a third of the students answered this question well.