Assessed exercise 1: instruction-level-parallelism in computing contour trees

The approach began by determining the best register update unit (RUU) size by measuring the instructions per cycle (IPC) and the total energy consumed for different values. As is seen in Figure 2, the lowest energy consumption occurs at an RUU size of 16. This can be explained by looking at Figure 1, which shows that the marginal throughput diminishes after an RUU of size 16. So, increasing RUU size from 2 to 16 decreased power usage, because the energy saved from using fewer cycles outweighed the increased energy from a larger RUU, but after size 16 this benefit is not seen, because the larger RUU is drawing more energy but not providing extra throughput in return, so power usage rises again.

Figure : IPC for different RUU sizes

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Figure : Energy consumption for different RUU sizes