Homework 10

Read the attached paper:

PC Processor Microarchitecture
A Concise Review of the Techniques Used in Modern PC Processors

Write a summary (no more than 2 pages) that expresses your opinions of the following questions:

(1) What are the major differences between modern PC processor architecture with that of the HC12 microcontroller you learned from this class?

(2) Give several instruction examples in the HC12 ISA that are not friendly to the pipelined design. Explain why.

(3) What is instruction level parallelism (ILP)? Give a HC12 code sequence that you wrote for your Lab, homework etc to prove the existence of ILP.

(4) Explain the basic idea of cache and branch predictor. Why they can reduce program execution time?

(5) Which hardware features need to be added if you are going to design a new version of HC12 that supports out-of-order and speculative execution?

(6) Explain why exploiting ILP makes processing interrupts much more difficult?