Homework 8

(Due Tuesday, April 7, 2020)

1. NVM basic
   a. What is NVM and PCM?
   b. What are the issues of DRAM and NVM hybrid memory systems?
   c. What is the basic idea of data placement between DRAM and PCM?

2. PIM basic
   a. What is the motivation of Processing in Memory (PIM)?
   b. Please give a successful example of PIM
   c. What are the barriers of adoption PIM?
   d. What is the relation between PIM and LPM?
   e. Assume we have developed technical solutions for the barriers, what are the limitation and potential of PIM? Can PIM replace CPU or GPU in the future? Please provide your explanation.

3. Please list as least 4 methods to solve data dependences in instruction processing pipeline.
4. Please list as least 3 methods to solve control dependences in instruction processing pipeline.
5. What are the conditions to make an ideal pipeline? Why instruction processing pipeline is not an ideal one?
6. Solve 3.1 of the text (6th edition)
7. Solve 3.2 of the text (6th edition)

Challenging Homework (could be part of your term project)

C-1. How could the newly emerged NVM technologies be effectively used in I/O systems?