Hardware/Software Codesign Lab 2 Questions and Answers

1. List the major operations in Steps 2 & 3 in Lab 2 manual.

Step 2 :   
 Changes in PS: **enabled GP0, FCLK\_RESET0\_N, and FCLK\_CLK0 ports**

Added soft cores in PL: added **two instances of GPIO** as well as one instance of **AXI interconnects**, one instance of **processor system reset** module.   
Step 3 connects the two GPIO instances to two **external I/O devices**: dip switches and push buttons. Then hardware design is **validated and synthesized, constrain files** are generated.

1. At which step the Vivado tool generates xparameter.h? Does Lab 1 and Lab 2 have the same xparameter.h? If different, Please describe the major difference. If the same, explain why.  
   After step 5-1-3 **generating board support package**, xparameter.h can be found in **standalone\_bsp** project. Lab 1 and Lab 2 have different xparameter.h as they have different hardware platform. The major differences are **IDs for the two GPIO instance** are added into xparameter.h.
2. What is the difference between Lab 1 and Lab 2 when we export hardware platform from Vivado IP integrator to SDK?

A **bitstream** is included in Lab 2. Lab 1 has no bitstream exported.

1. Describe the difference between Lab 1 and Lab 2 for running the application program.  
   In Lab 2, as we add soft core in PL, we need to **program FPGA**(download the hardware bitstream) before we run software application.