Vivado & Vitis — LED with AXI GPIO

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Agenda

- Vivado — AXI GPIO Block Design
- Vitis — A Sample for Driving AXI GPIO LED

Vivado – AXI GPIO Block Design

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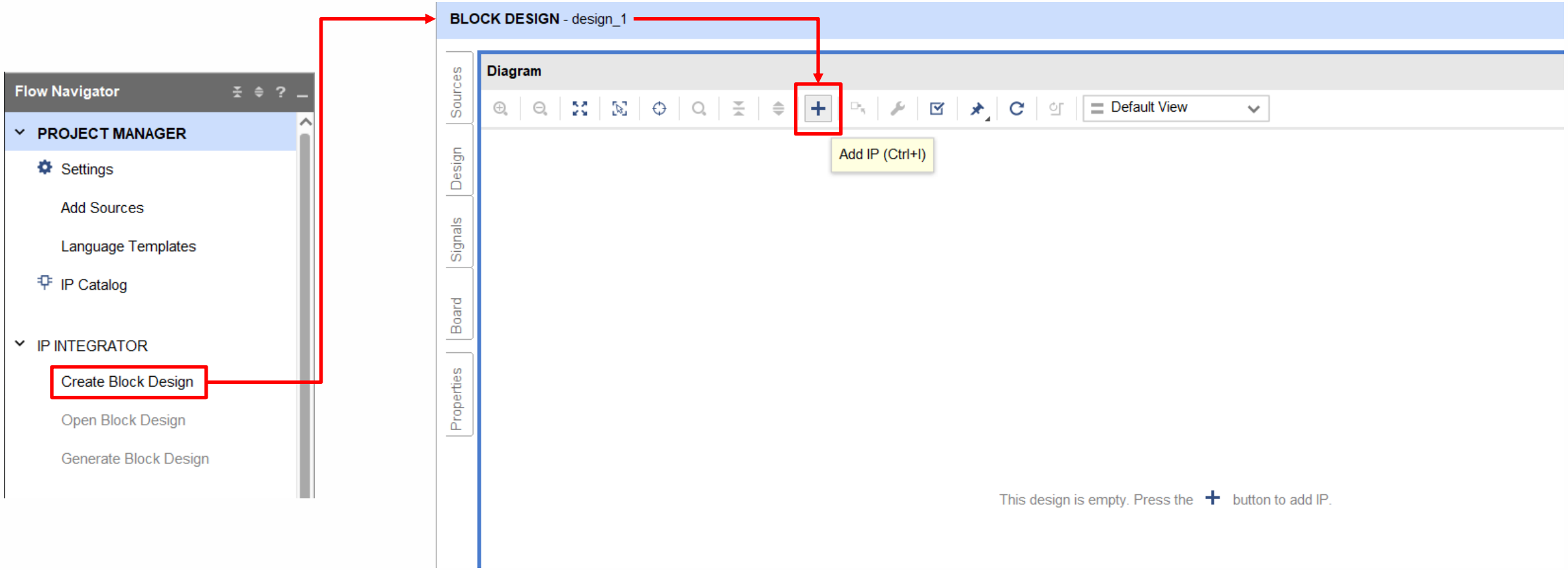
Block Design

- Step 1: Add Zynq Processing System IP



Block Design

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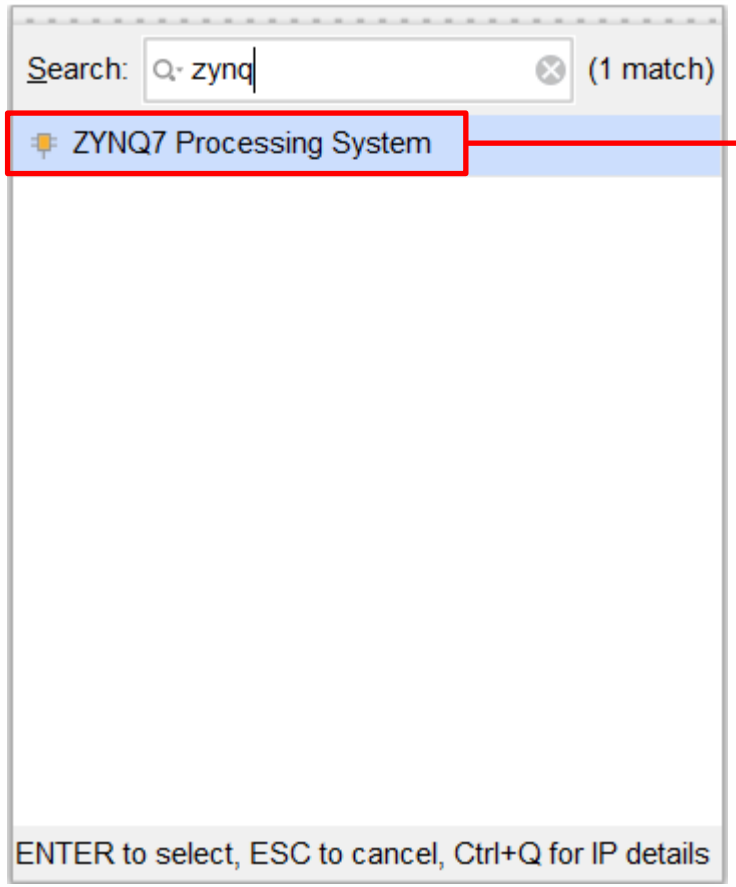

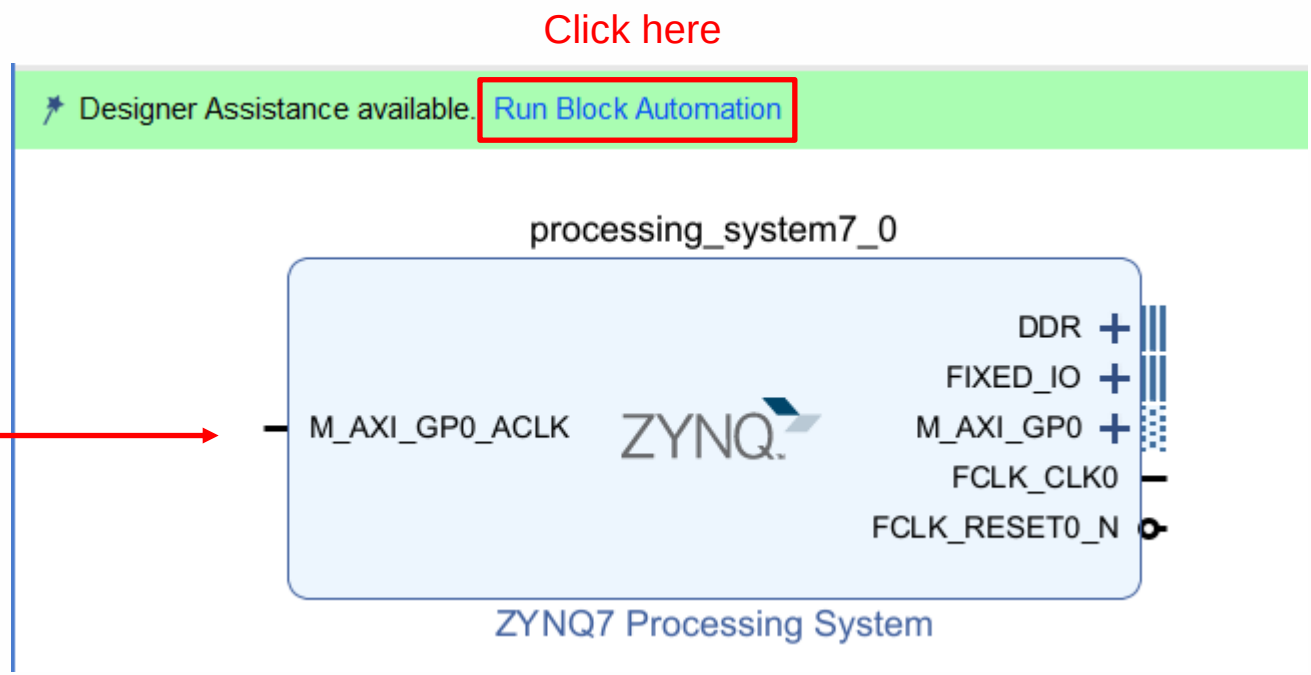

Block Design

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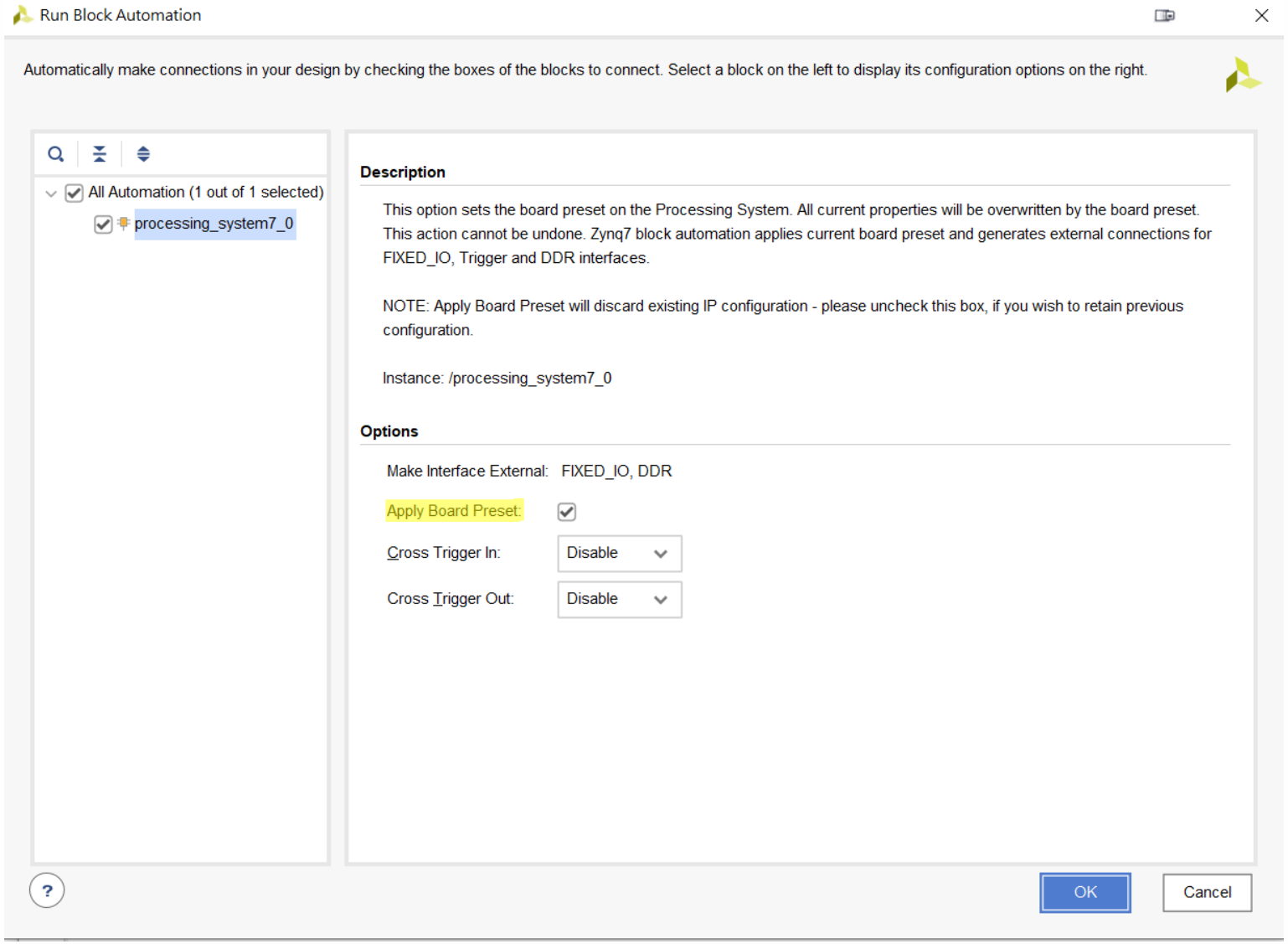

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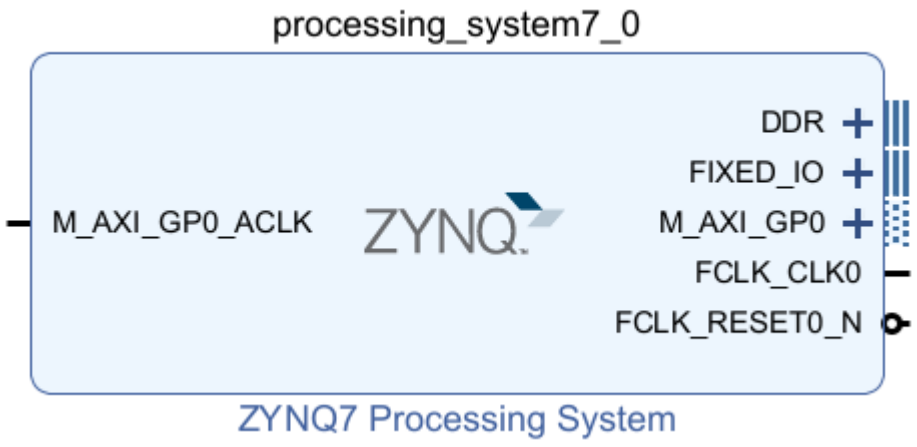
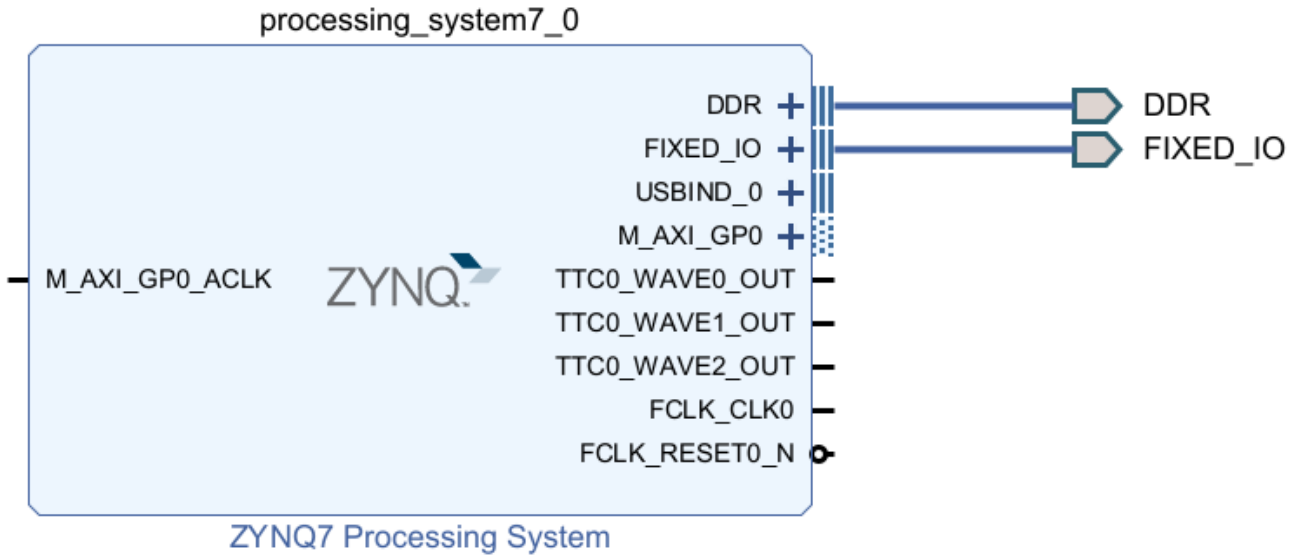


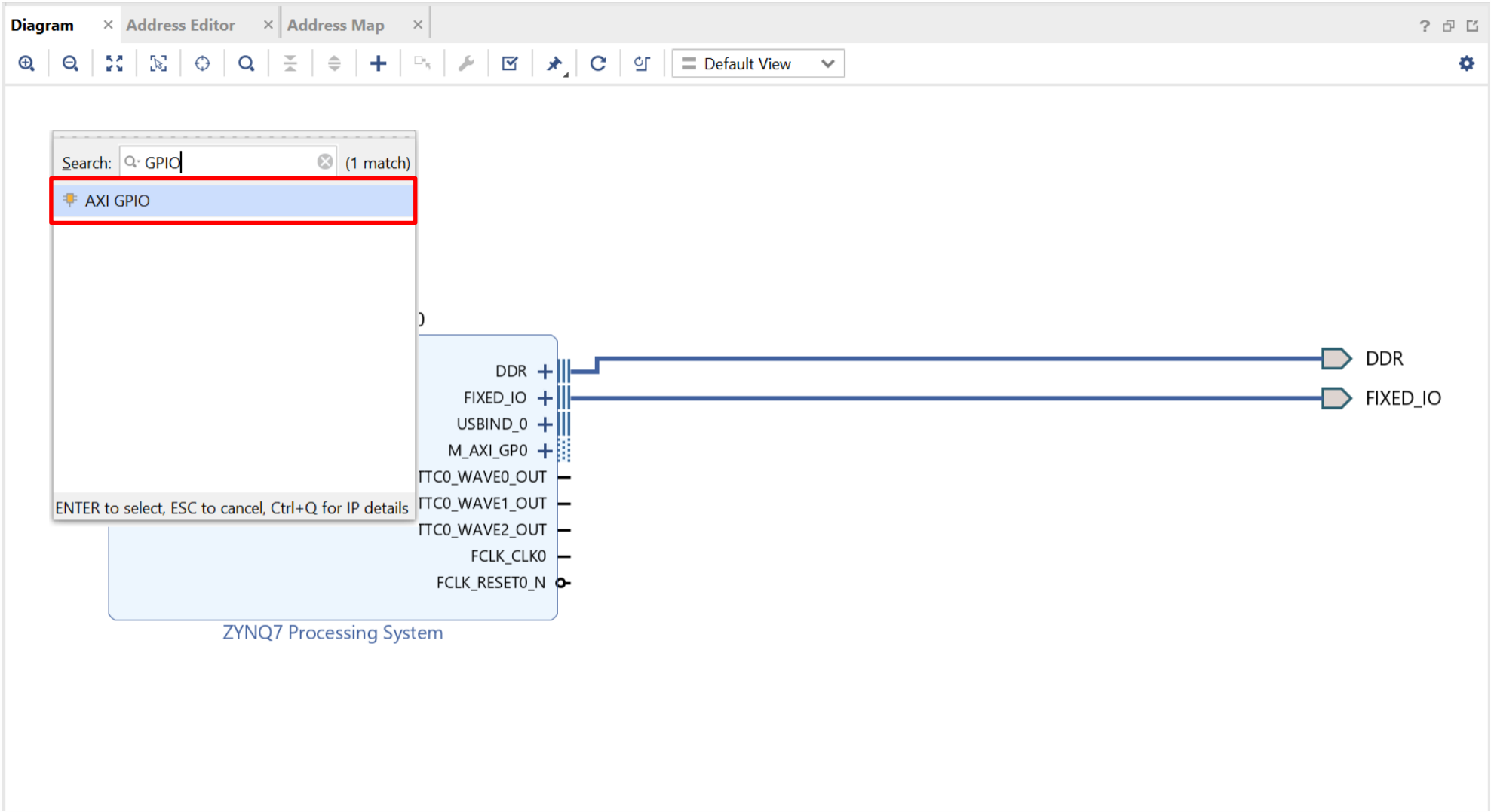
Before



After

Block Design

- Step 2: Add AXI GPIO IP to Block Design



Block Design

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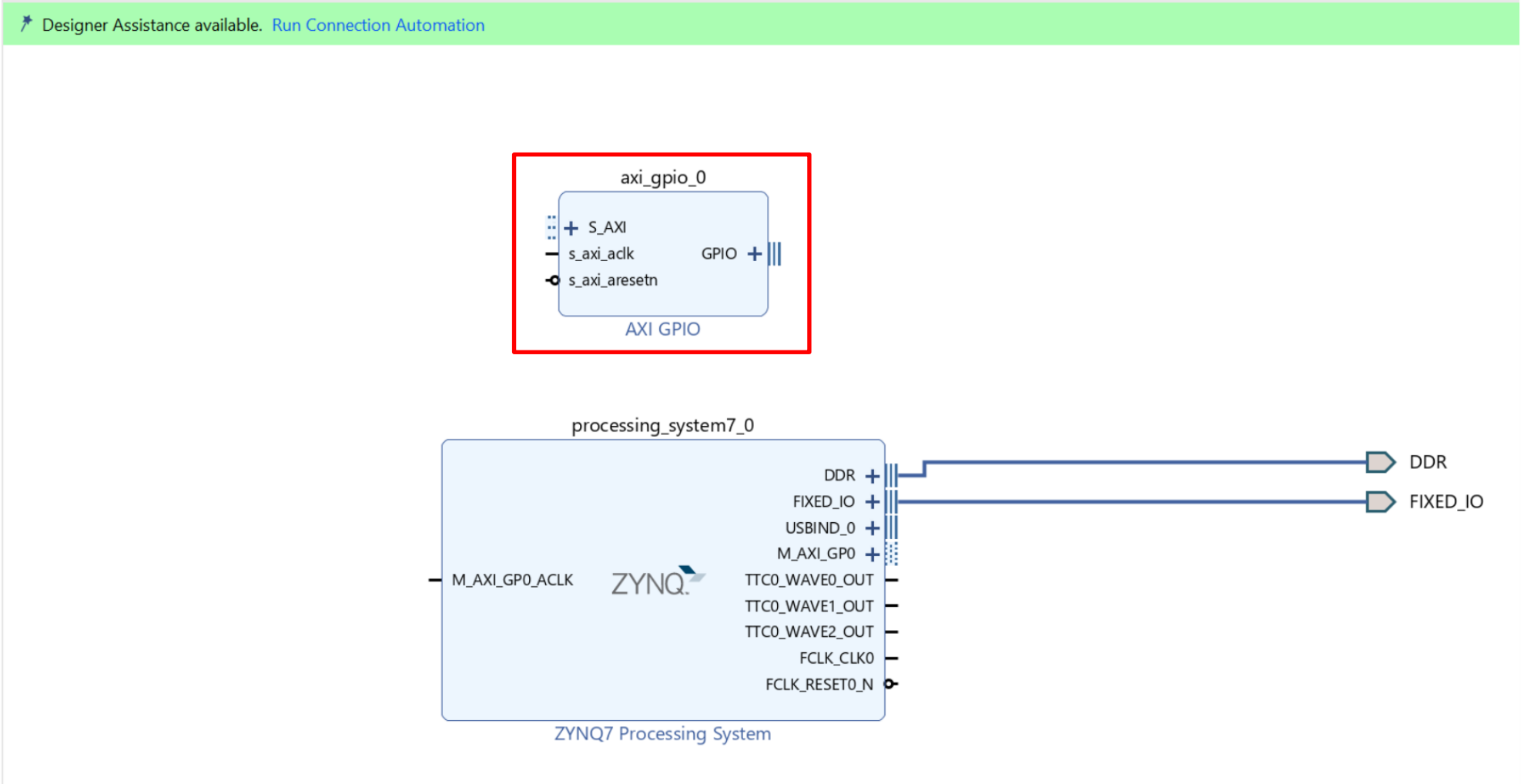
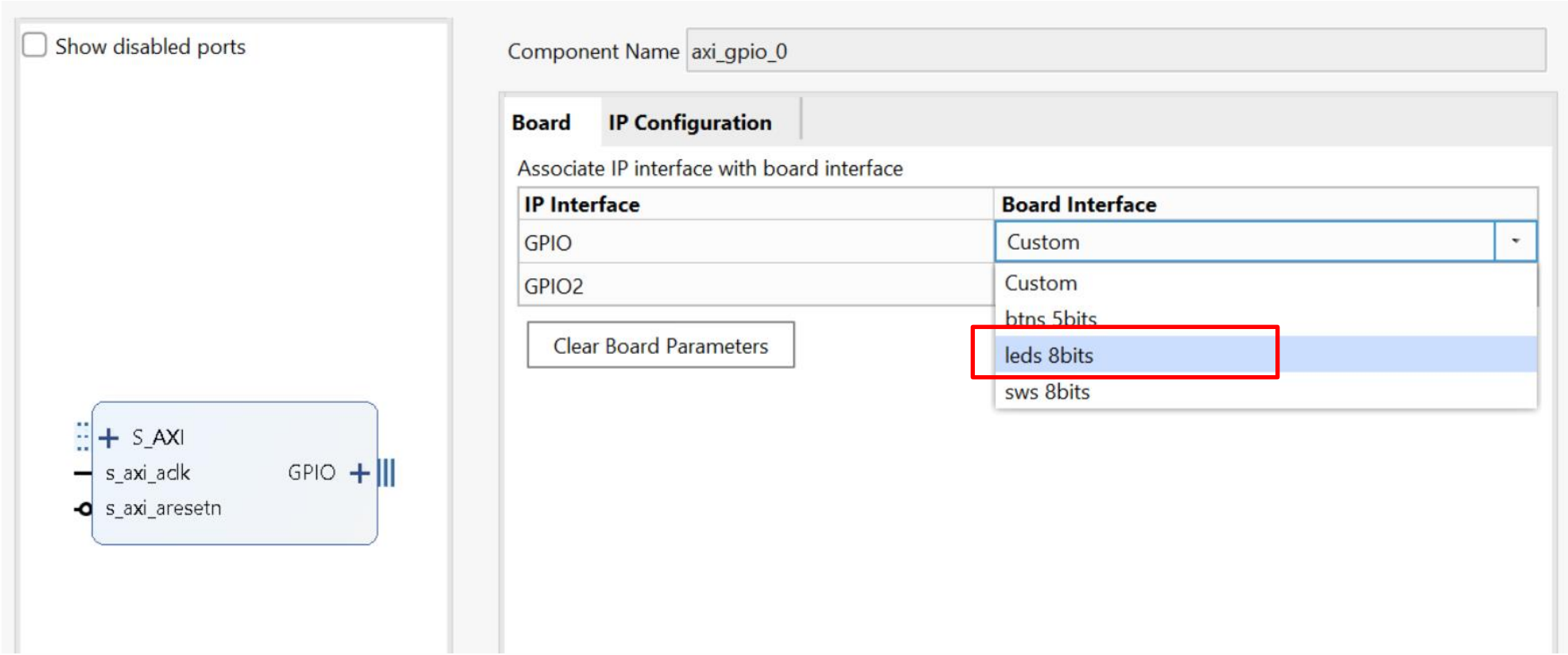


Block Design

- Step 2: Add AXI GPIO IP to Block Design



Block Design

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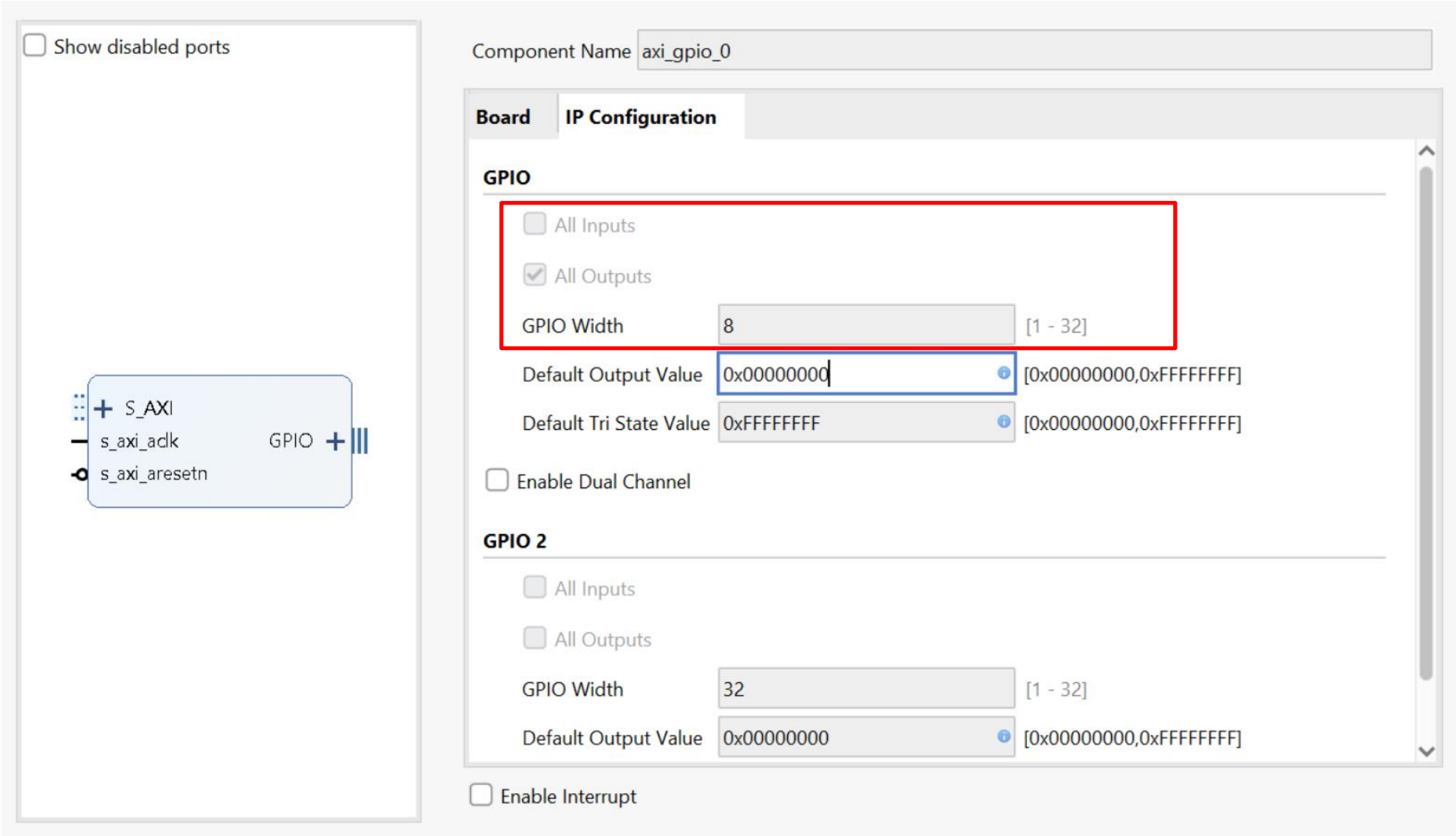

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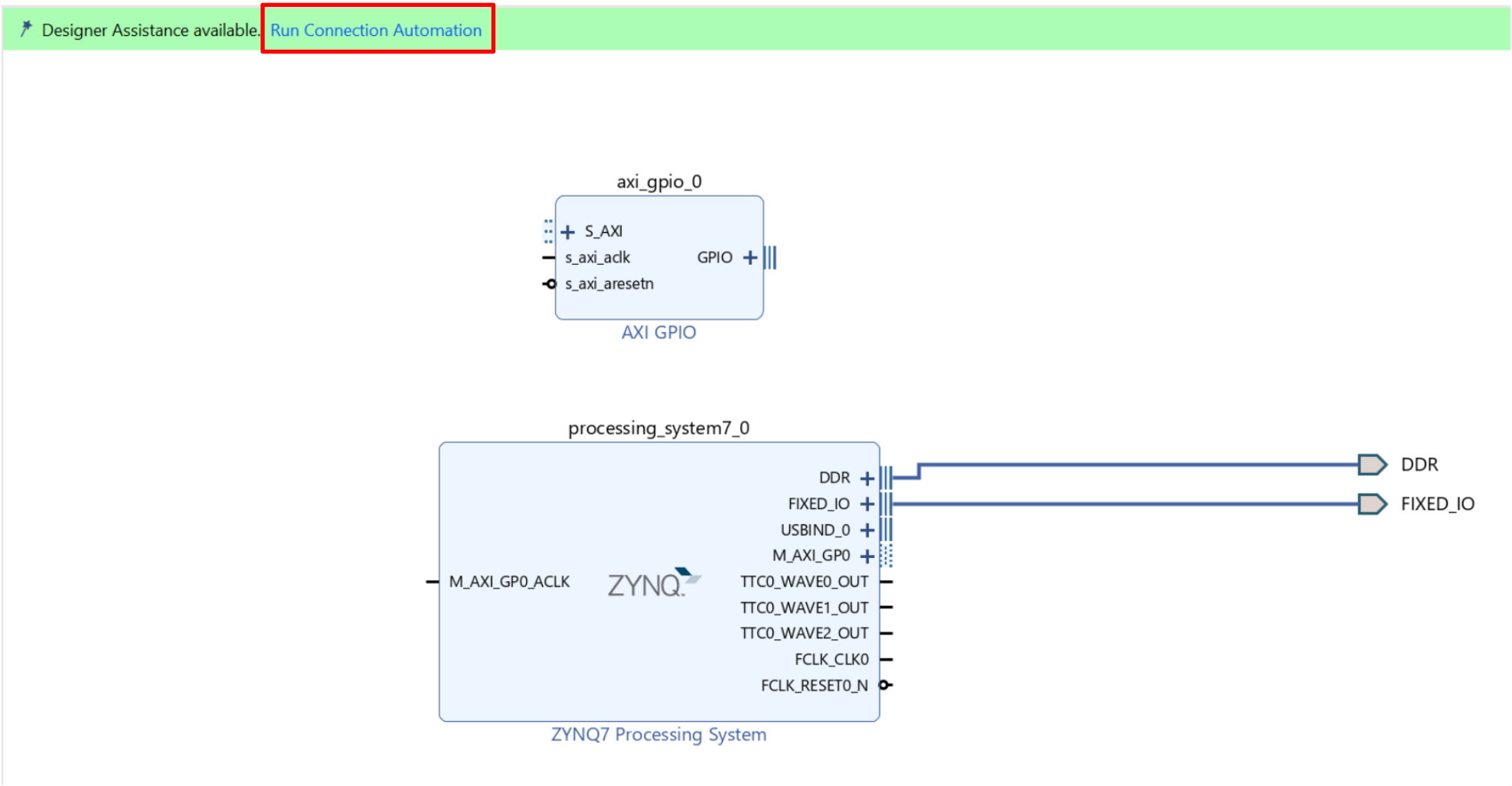
Block Design

- Step 3: Run Connection Automation



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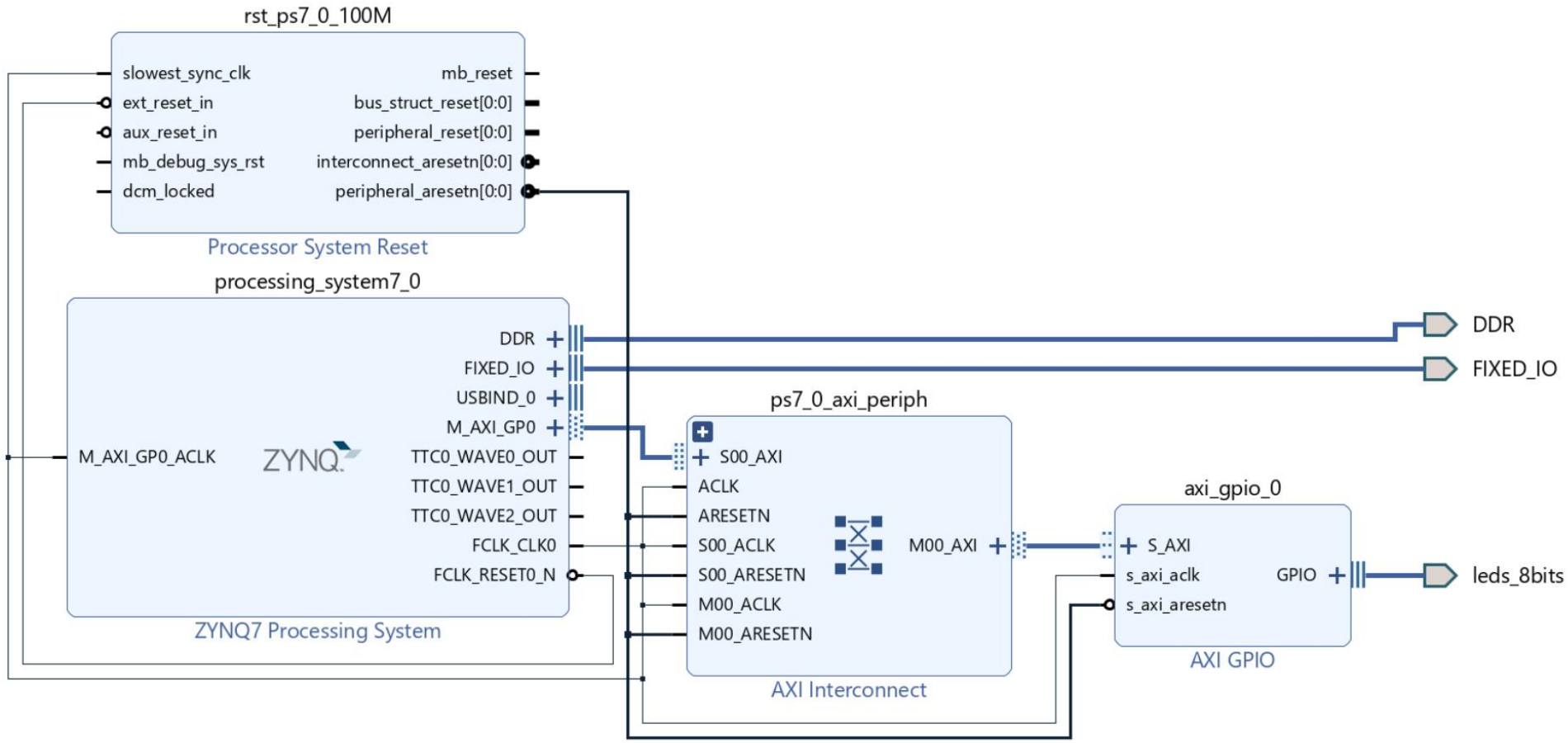
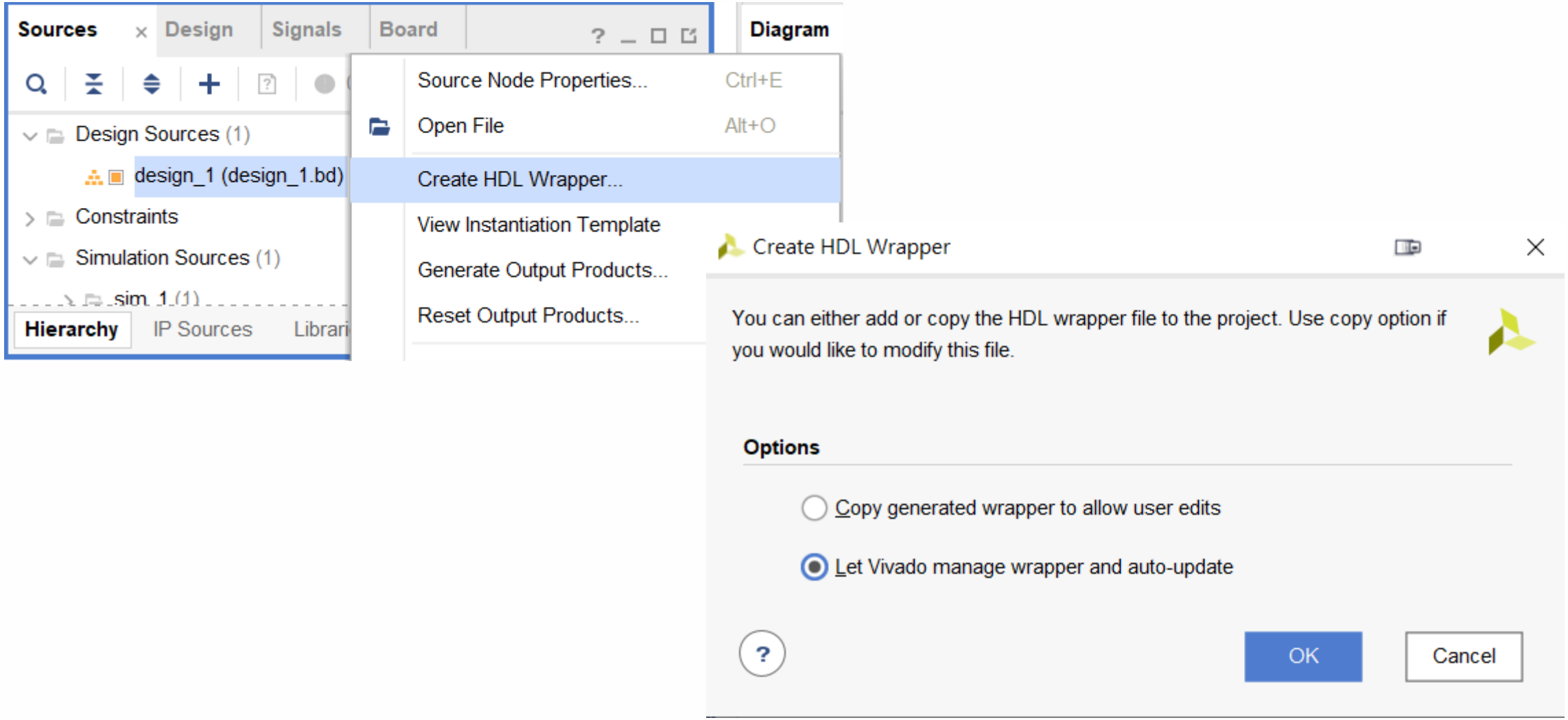


Block Design

- Step 4: Generate XSA file for Vitis



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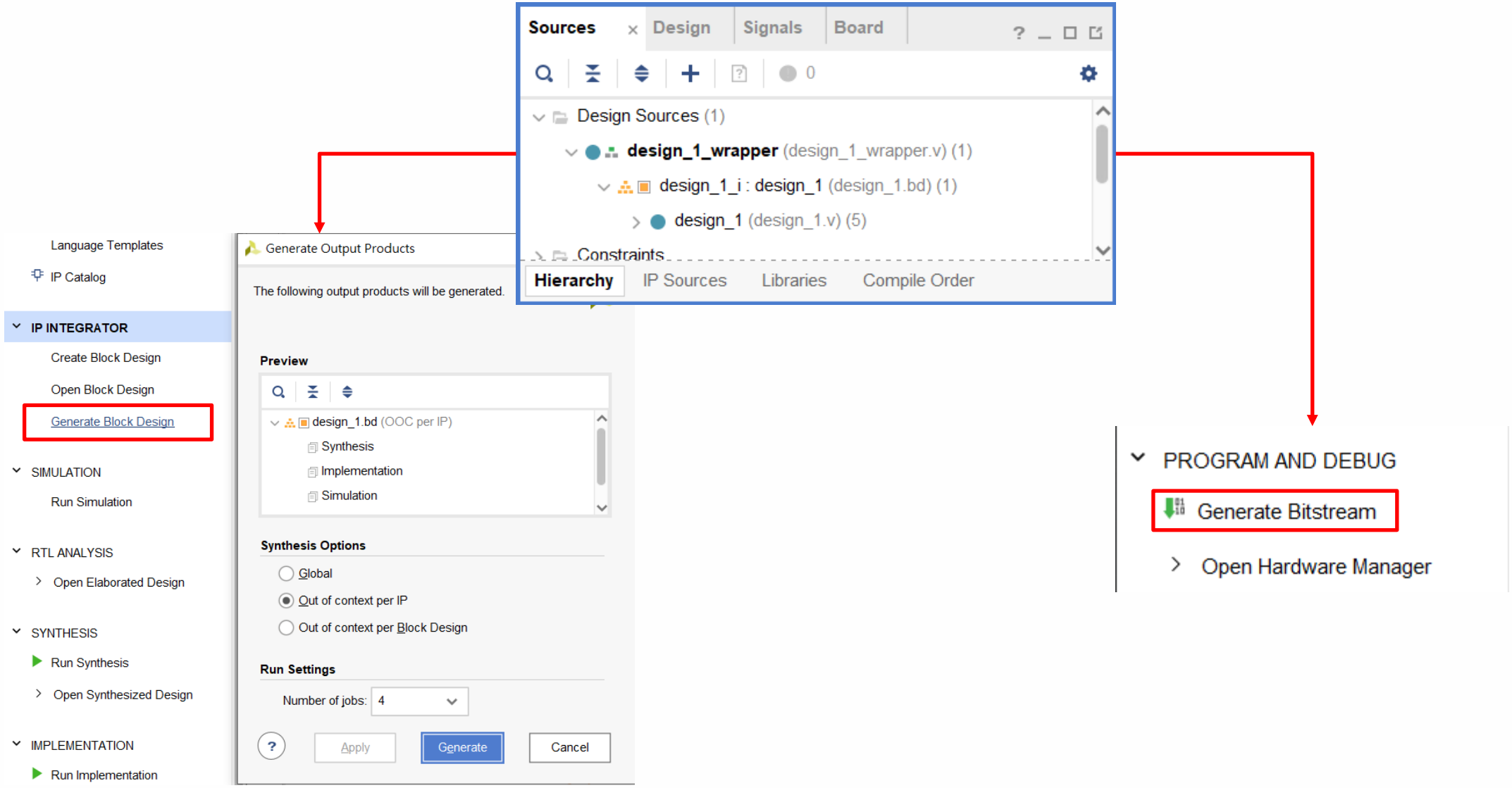

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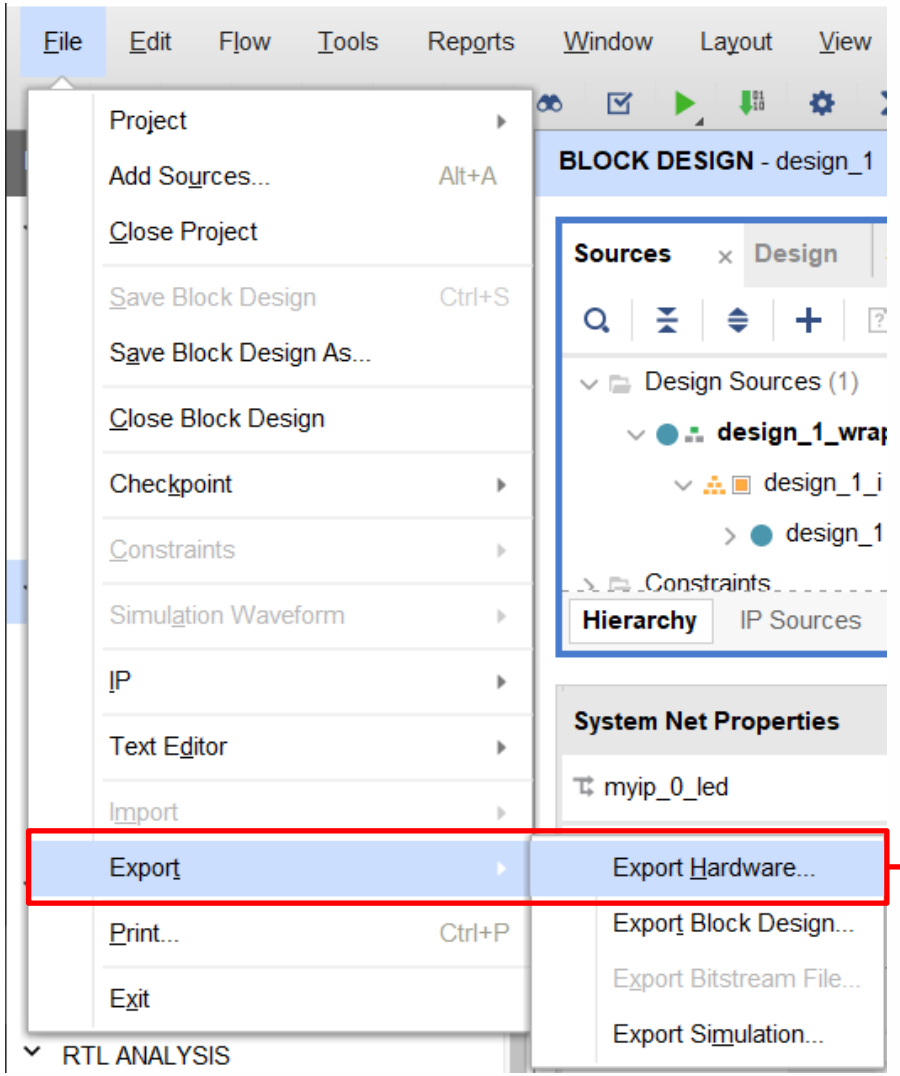

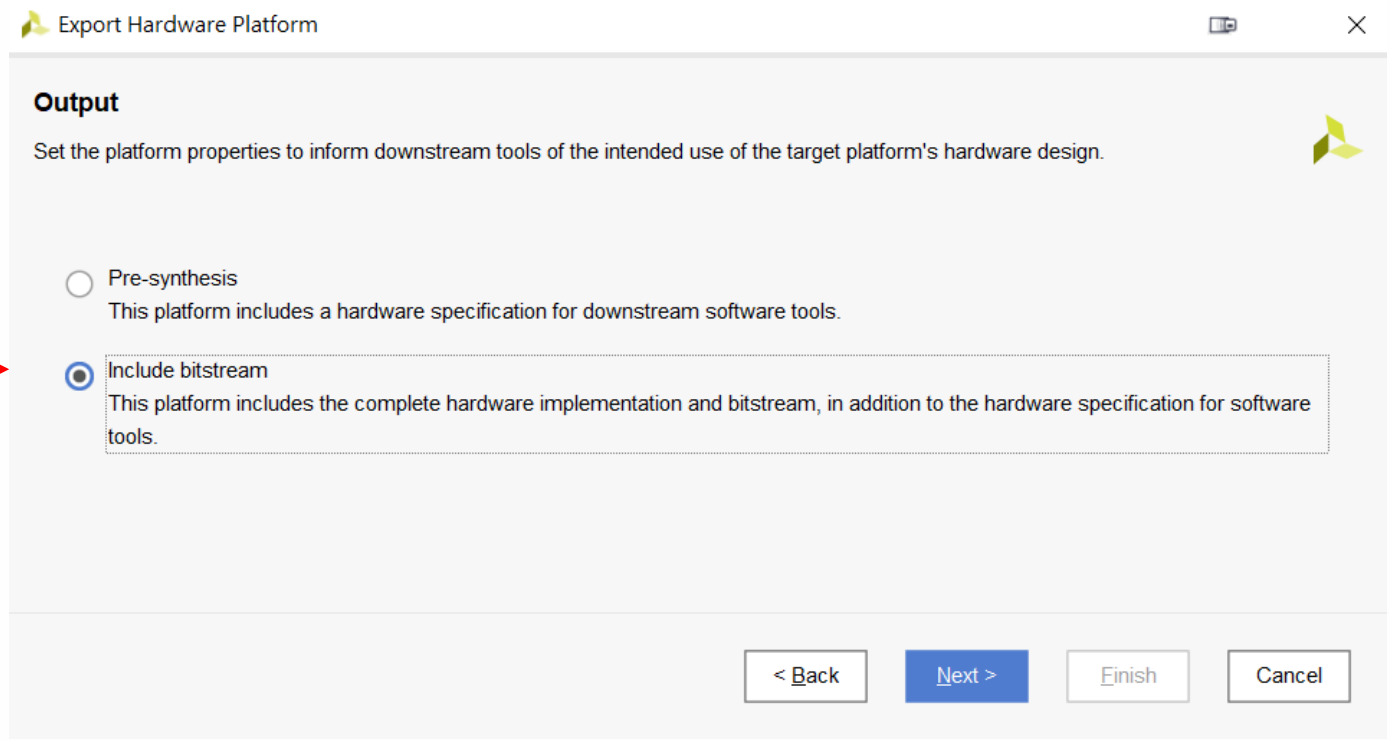

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Vitis — A Sample for Driving AXI GPIO LED

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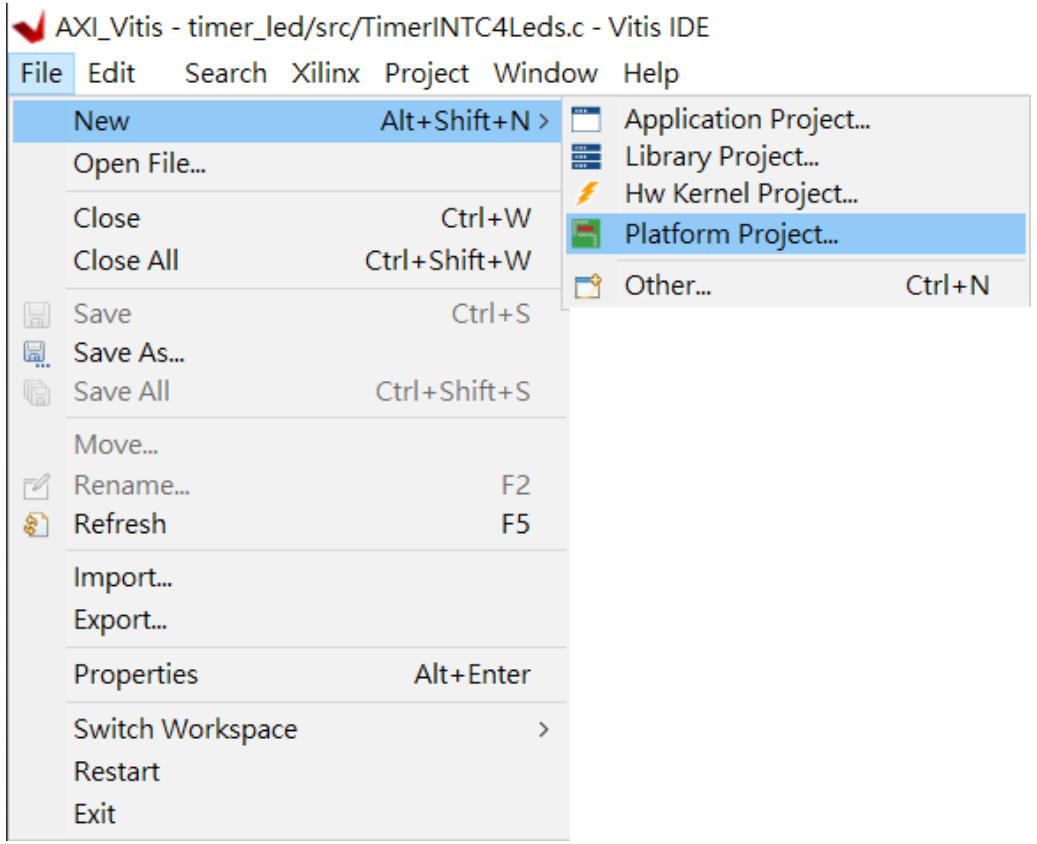
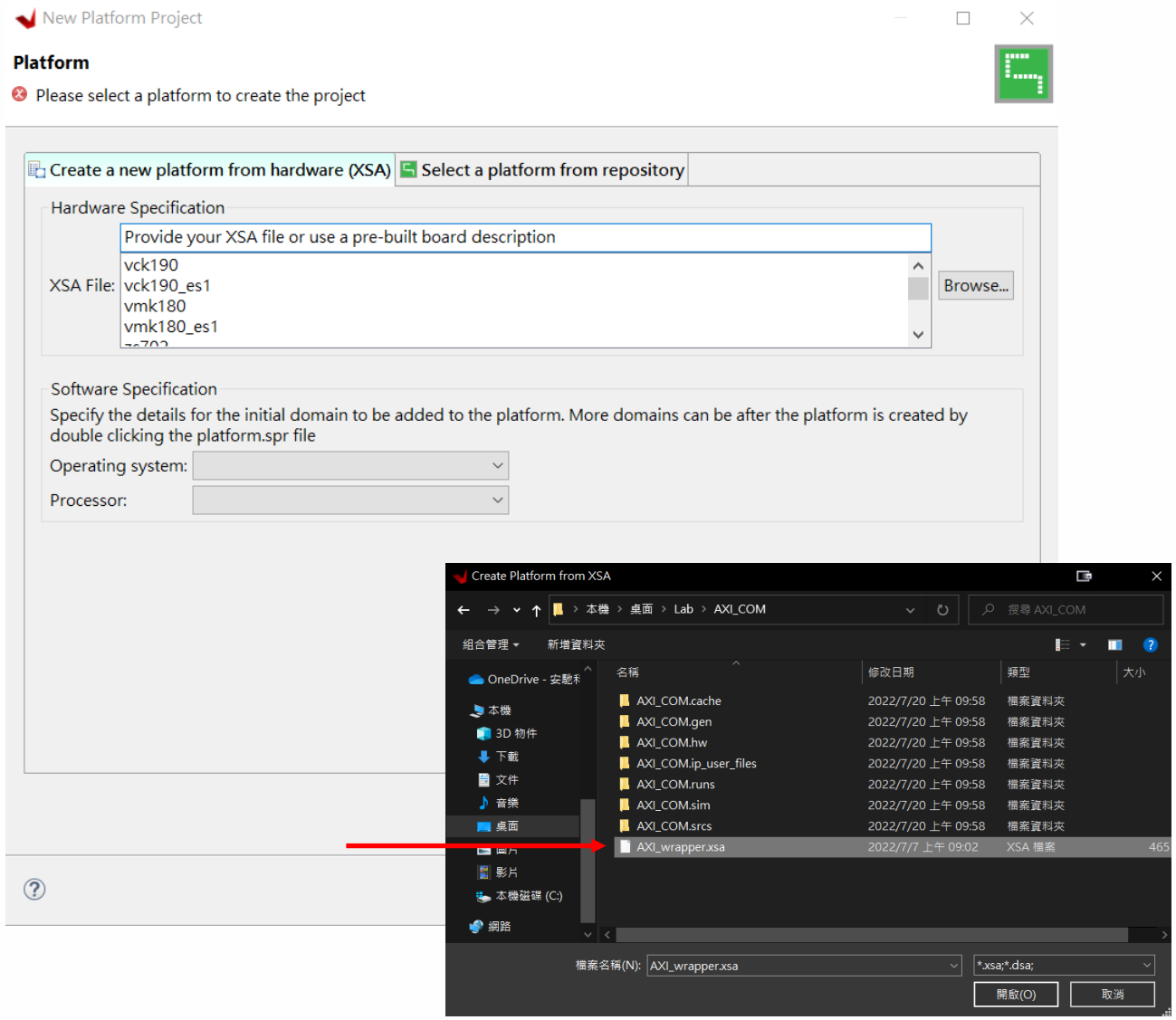
Create Platform





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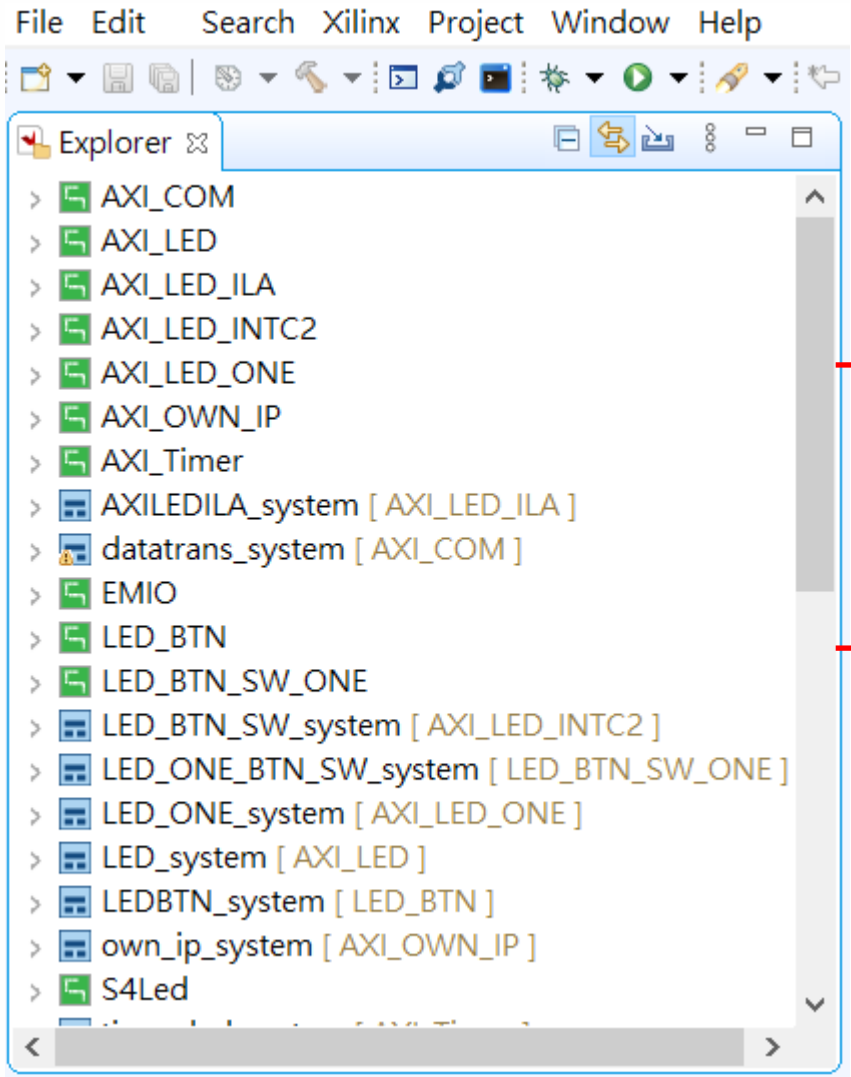
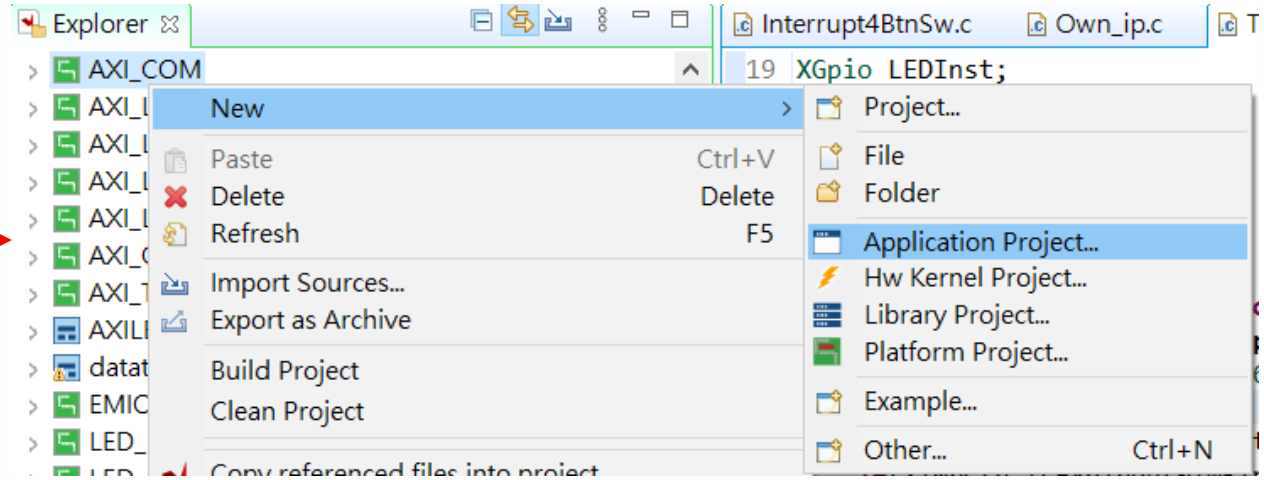
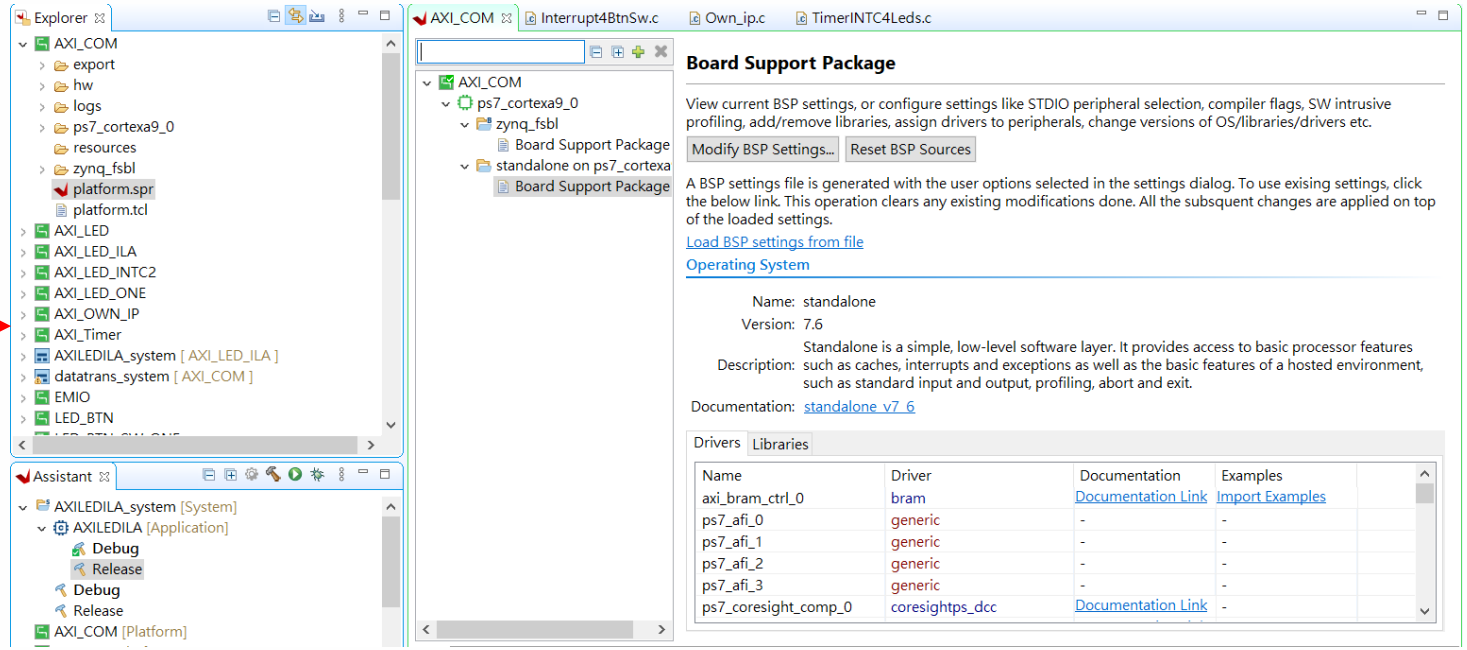
Create Application







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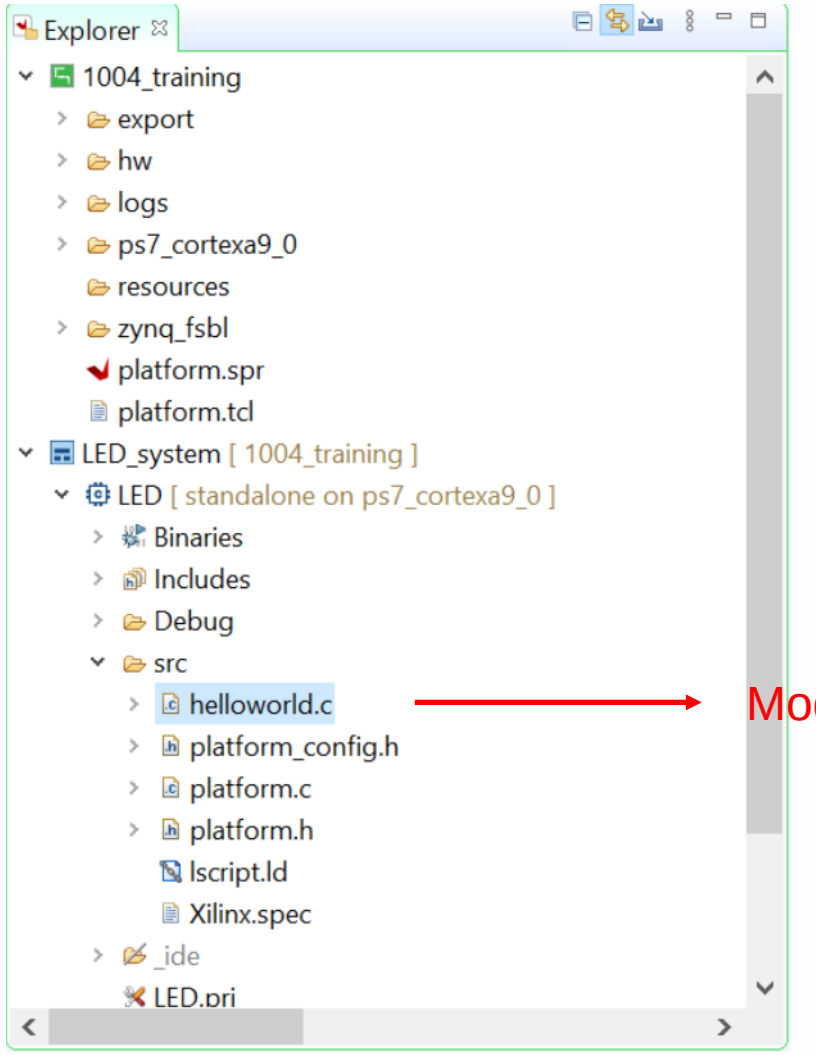
Example Code

- Light the Leds



Modify this file for your own code

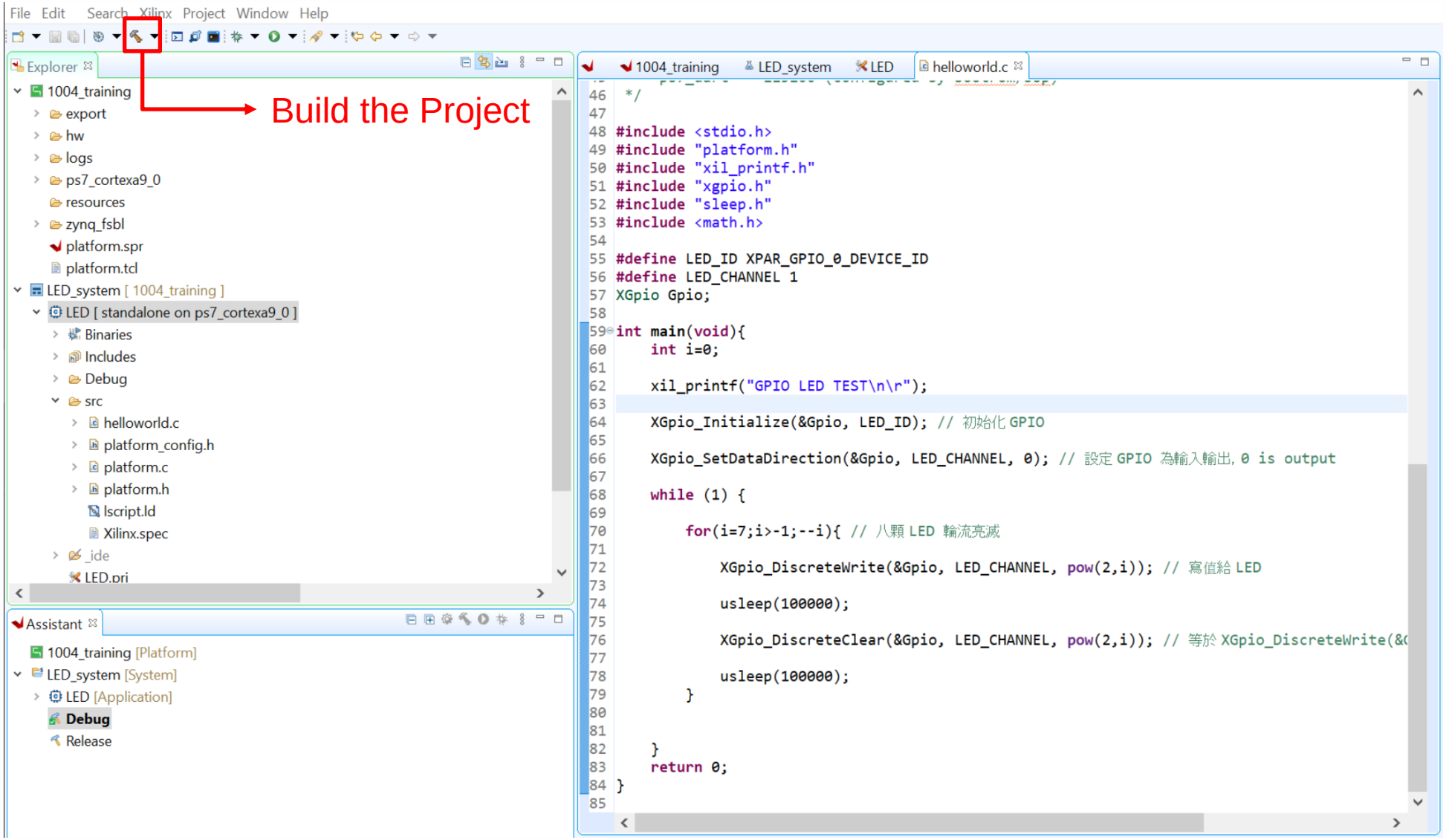
Example Code

- Light the Leds

```c
#include <stdio.h>
#include "platform.h"
#include "xil_printf.h"
#include "xgpio.h"
#include "sleep.h"
#include <math.h>

#define LED_ID XPAR_GPIO_0_DEVICE_ID
#define LED_CHANNEL 1
XGpio Gpio;

int main(void){
    int i=0;

    xil_printf("GPIO LED TEST\n\r");

    XGpio_Initialize(&Gpio, LED_ID); // 初始化 GPIO

    XGpio_SetDataDirection(&Gpio, LED_CHANNEL, 0); // 設定 GPIO 為輸入輸出, 0 is output

    while (1) {

        for(i=7;i>-1;--i){ // 八顆 LED 輪流亮滅

            XGpio_DiscreteWrite(&Gpio, LED_CHANNEL, pow(2,i)); // 寫值給 LED

            usleep(100000);

            XGpio_DiscreteClear(&Gpio, LED_CHANNEL, pow(2,i)); // 等於 XGpio_DiscreteWrite(&Gpio,LED_CHANNEL,0x00), 即全清零

            usleep(100000);
        }


    }
    return 0;
}
```

Example Code

- Light the Leds



Vitis Build Problem

- Build Error

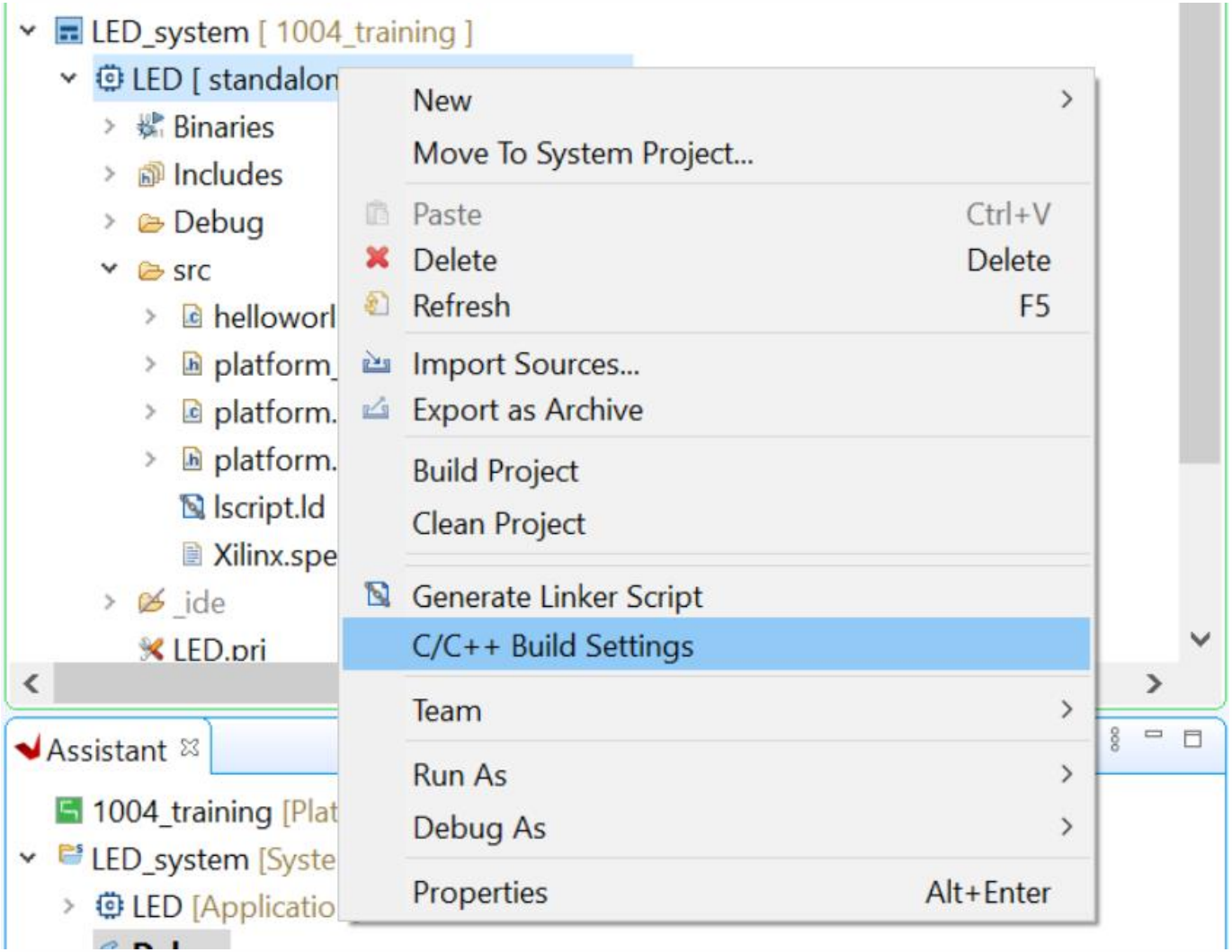
Console | Problems | Vitis Log | Guidance

Build Console [LED, Debug]

```
13:52:59 **** Incremental Build of configuration Debug for project LED ****
make all
make --no-print-directory pre-build
a9-linaro-pre-build-step
' '
make --no-print-directory main-build
'Building target: LED.elf'
'Invoking: ARM v7 gcc linker'
arm-none-eabi-gcc -mcpu=cortex-a9 -mfpu=vfpv3 -mfloat-abi=hard -Wl,-build-id=none -specs=Xilinx.spec -Wl,-T -Wl,../src/lscript.ld -LC:/Users/User
c:/xilinx/vitis/2021.1/gnu/aarch32/nt/gcc-arm-none-eabi/x86_64-oesdk-mingw32/usr/bin/arm-xilinx-eabi/../../libexec/arm-xilinx-eabi/gcc/arm-xilinx
C:\Users\User\Desktop\AXI_Vitis_211\LED\Debug/../src/helloworld.c:72: undefined reference to `pow'
c:/xilinx/vitis/2021.1/gnu/aarch32/nt/gcc-arm-none-eabi/x86_64-oesdk-mingw32/usr/bin/arm-xilinx-eabi/../../libexec/arm-xilinx-eabi/gcc/arm-xilinx
collect2.exe: error: ld returned 1 exit status
make[1]: *** [makefile:43: LED.elf] Error 1
make: *** [makefile:34: all] Error 2

13:53:00 Build Finished (took 306ms)
```

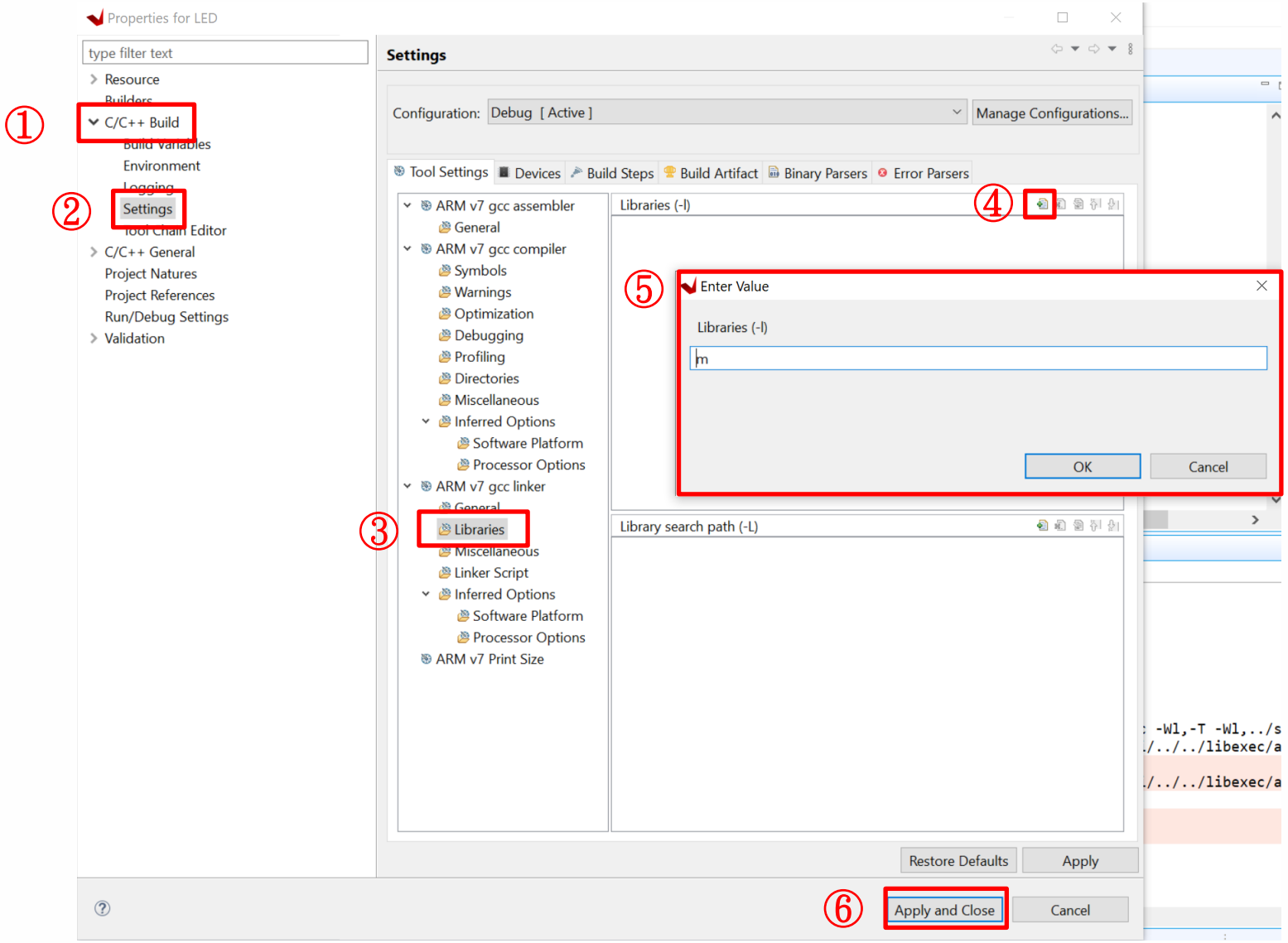
Vitis Build Problem

- Build Error - Solution

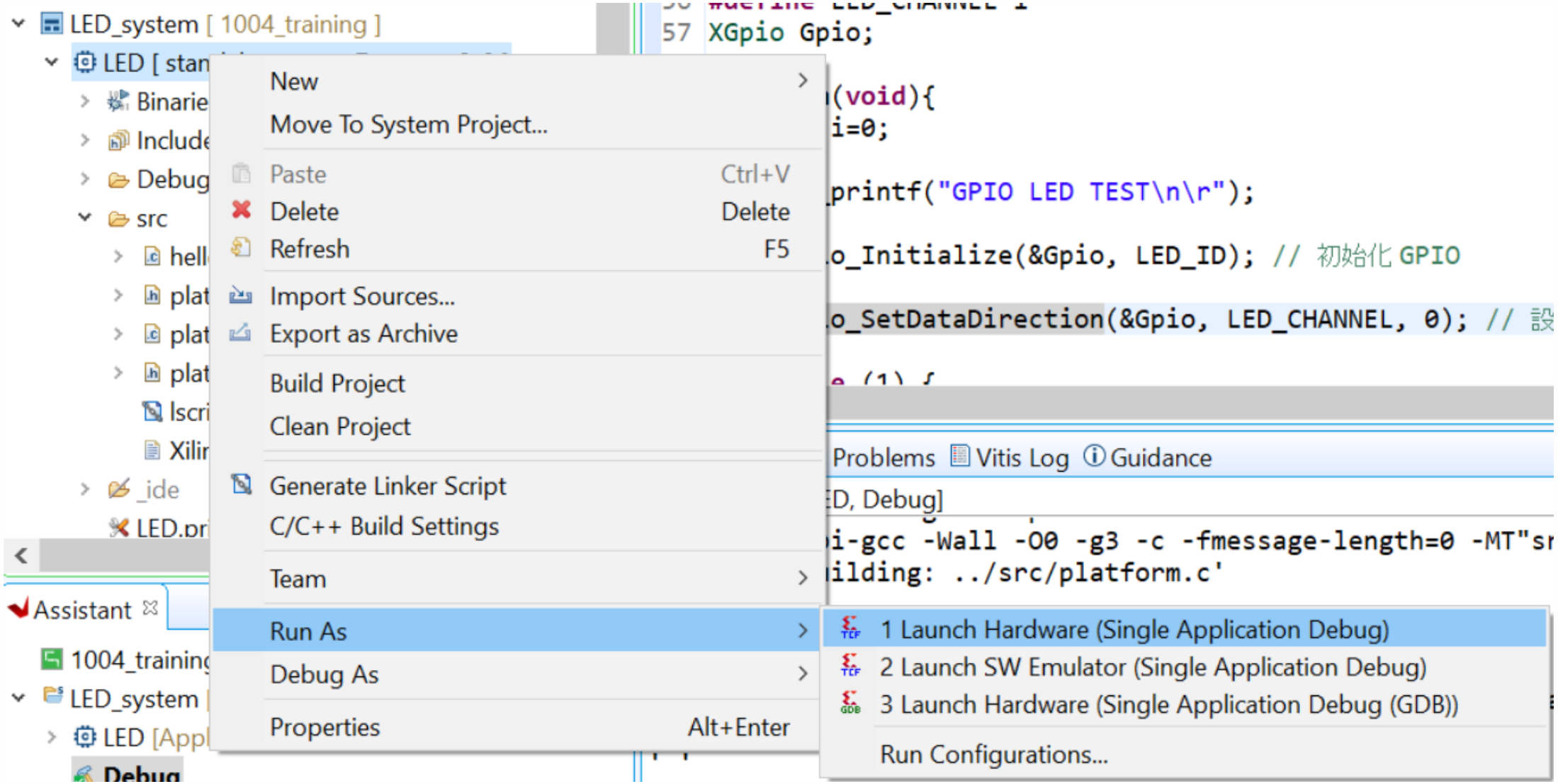


Vitis Build Problem

- Build Error - Solution



Run on Hardware



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Results