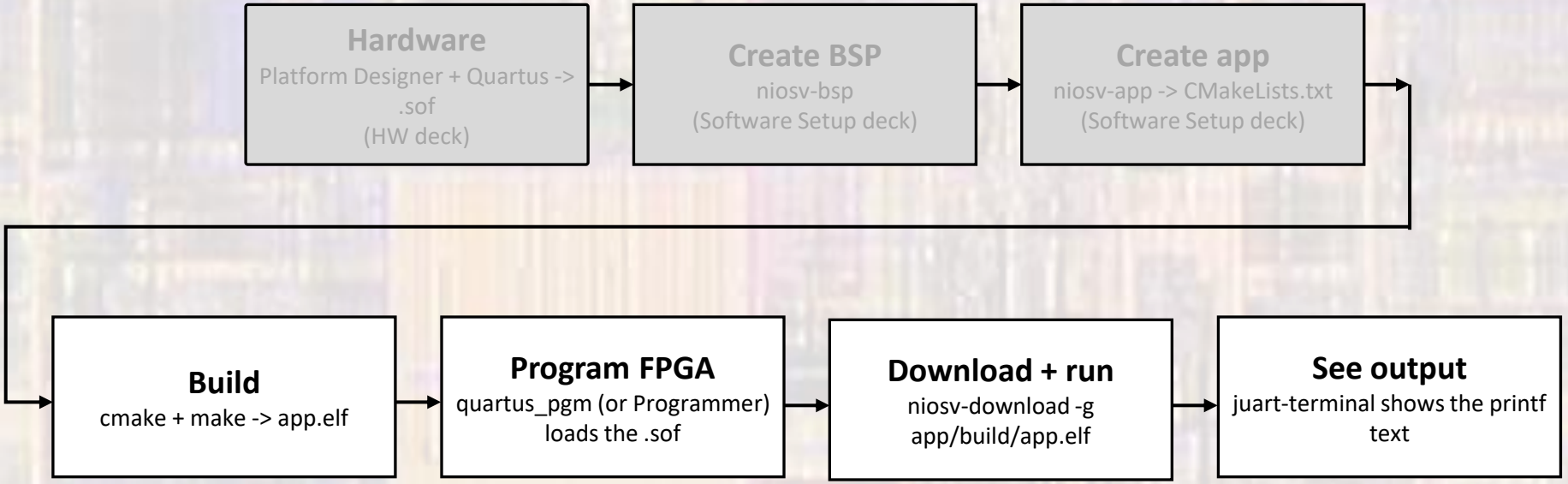
NIOS-V Running Software

Last updated 10/29/26

NIOS-V Running Software

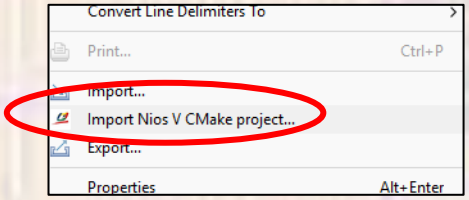
- From hardware to a running program



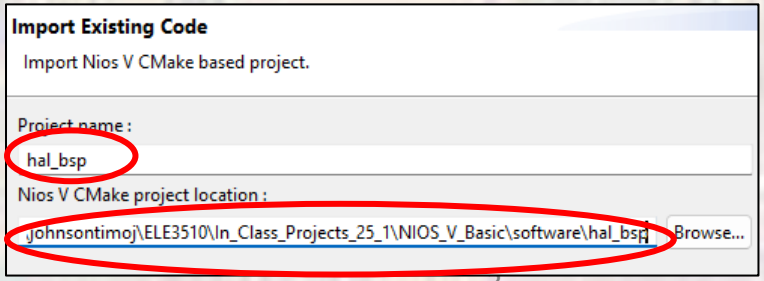
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NIOS-V Running Software

- RiscFree IDE - import and build
  - Start the NIOS V Command Shell
    - C:\altera_lite\25.1std\niosv\bin\niosv-shell.exe
  - cd to your software directory
    - type RiscFree
      - set the workspace as your software directory
  - Import the BSP
    - File → Import → Nios V CMake project...



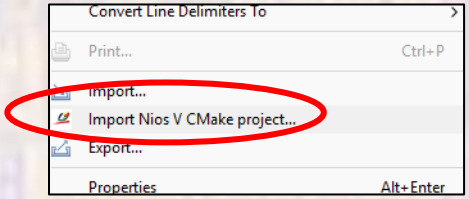
    - Project name: hal_bsp
    - Project location: browse to software\hal_bsp



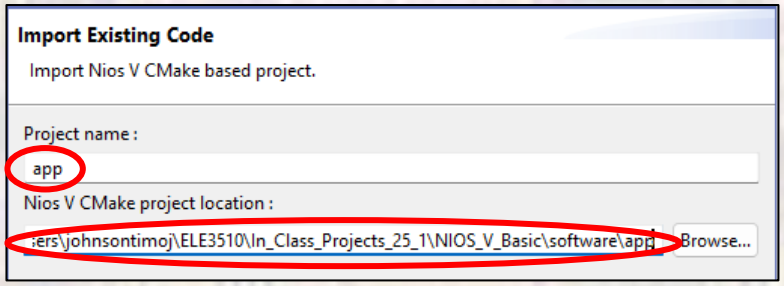
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NIOS-V Running Software

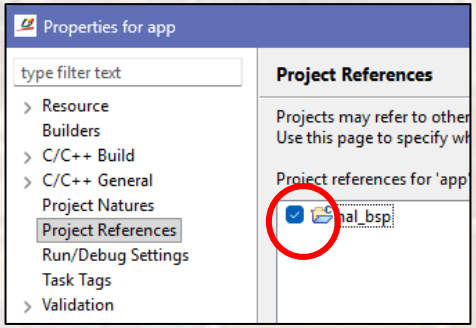
- RiscFree IDE - import and build – cont'd
  - Import the app
    - File → Import → Nios V CMake project...



    - Project name: app
    - Project location: browse to software\app



  - Link the app to the BSP
    - Rt click app → Properties → Project References
    - check hal_bsp
    - Apply and Close



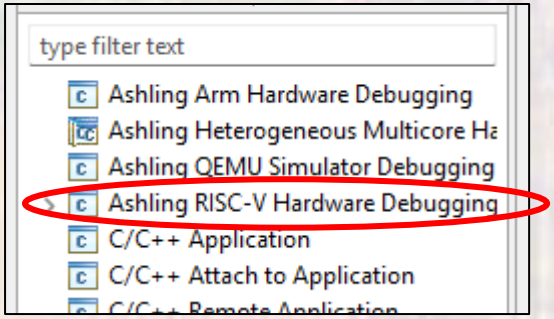
NIOS-V Running Software

- RiscFree IDE - import and build – cont'd
  - Build: Rt click app → Build Project
    - Fix any errors

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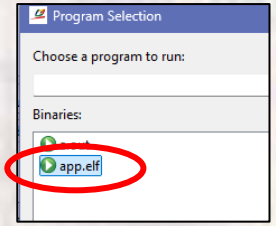
NIOS-V Running Software

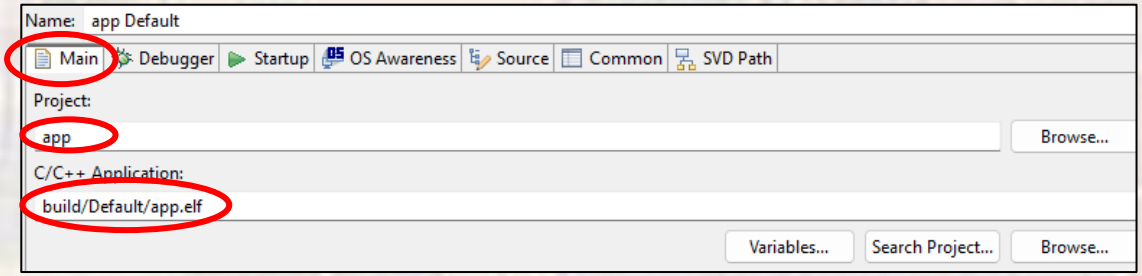
- RiscFree IDE - debug setup
  - Program the FPGA if not already done
  - Run → Debug Configurations → dbl click Ashling RISC-V Hardware Debugging



  - Main tab: Project = app

    C/C++ Application = search project → select app.elf

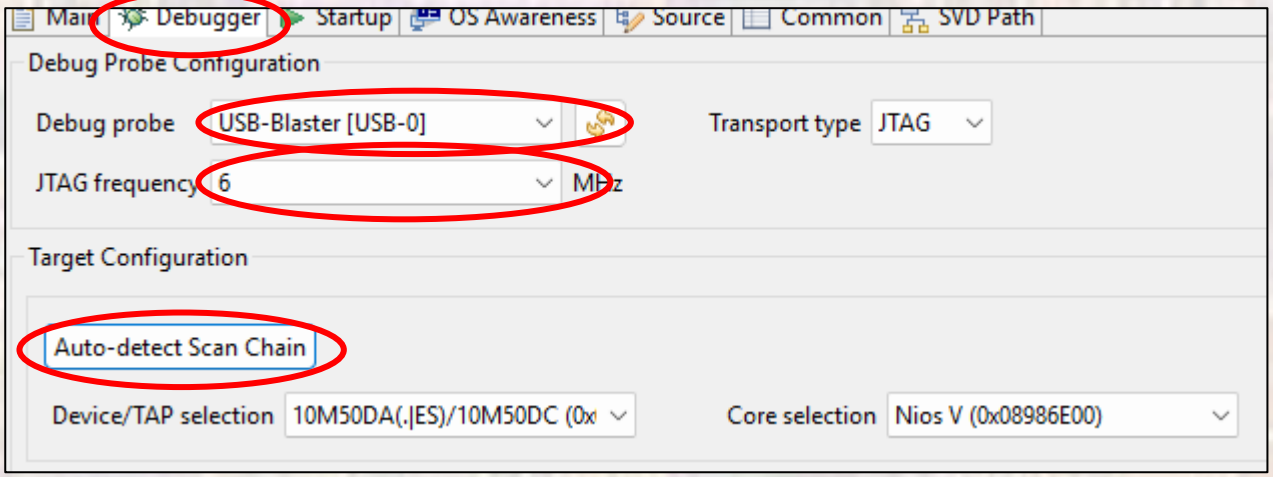




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NIOS-V Running Software

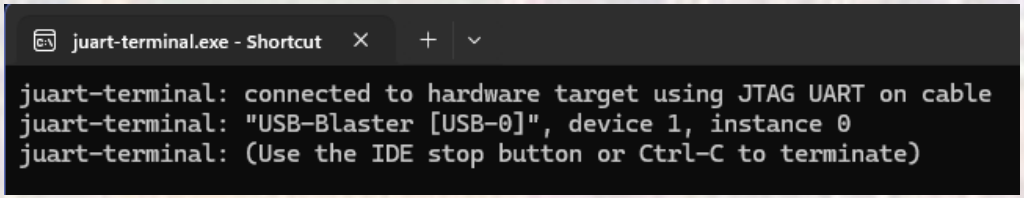
- RiscFree IDE - debug setup – cont'd
  - Debugger tab:
    - Debug probe = USB-Blaster [USB-0]
    - Transport = JTAG
    - JTAG frequency: 6 MHz or lower (the 16 MHz default is too fast here)
    - Auto-detect Scan Chain
    - Apply
    - Debug - stops at main



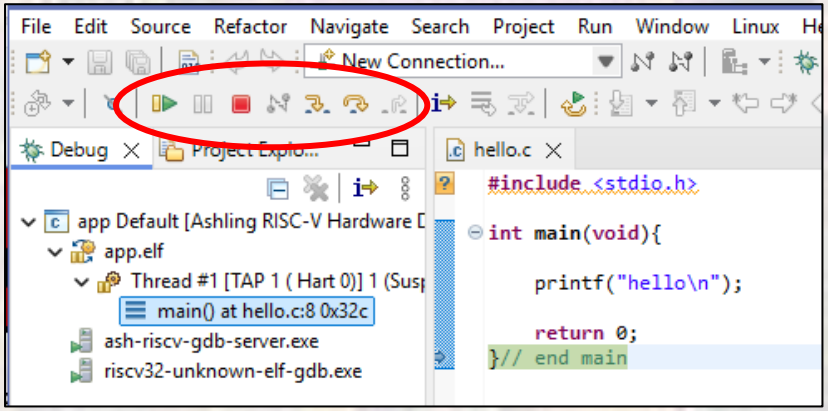
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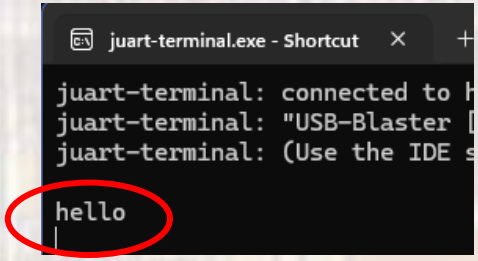
NIOS-V Running Software

- See output in external console
  - The external console does not echo typed inputs
  - Close any other juart-terminal first (using the task manager)
  - Start C:\altera_lite\25.1std\quartus\bin64\juart-terminal.exe



  - debug as usual



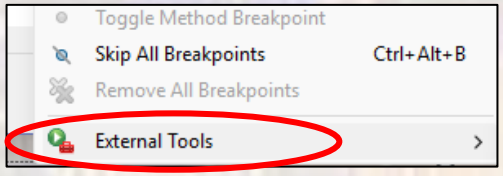


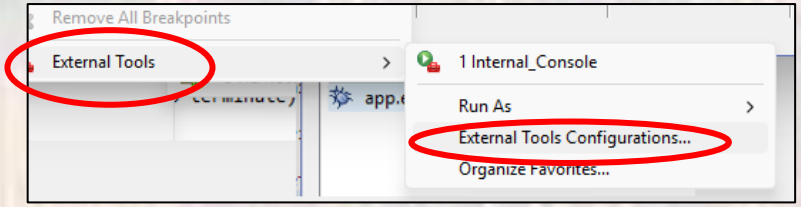
  - Note: the program never ends since there is no OS to return to

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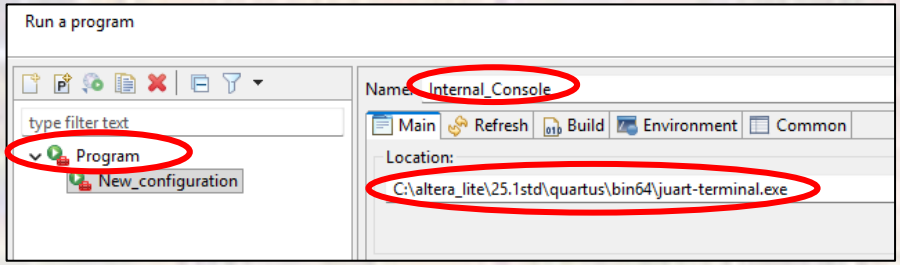
NIOS-V Running Software

- See output in IDE console – setup internal console
  - The internal console echos typed input
  - Close any other juart-terminal first (using the task manager)
  - Run → External Tools → External Tools Configurations





  - dbl click Program
    - Name: internal_console
    - Location: browse file system: C:\altera_lite\25.1std\quartus\bin64\juart-terminal.exe

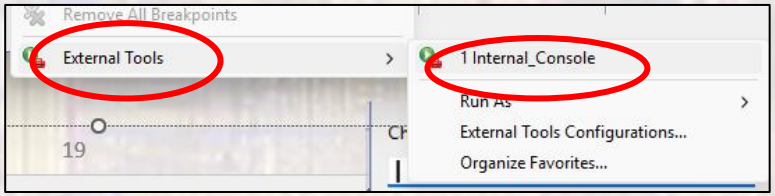


  - apply
  - run
    - nothing happens yet

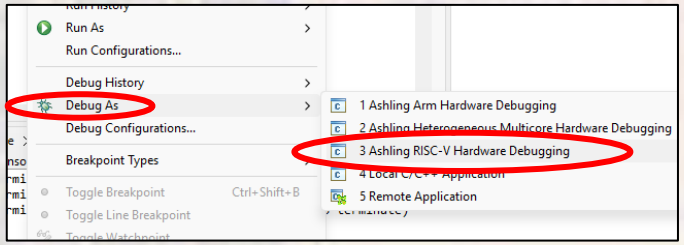
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NIOS-V Running Software

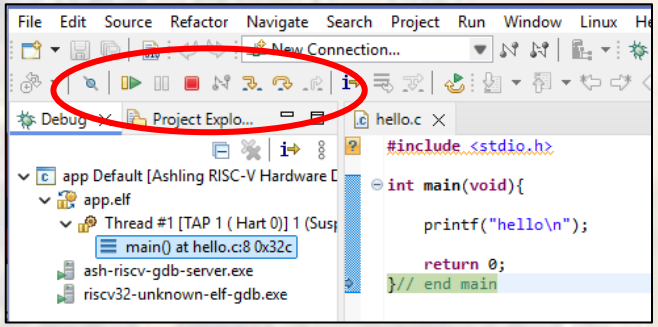
- See output in IDE console
  - Start the external tool connection (internal console)
    - Run → External Tools → Internal_Console

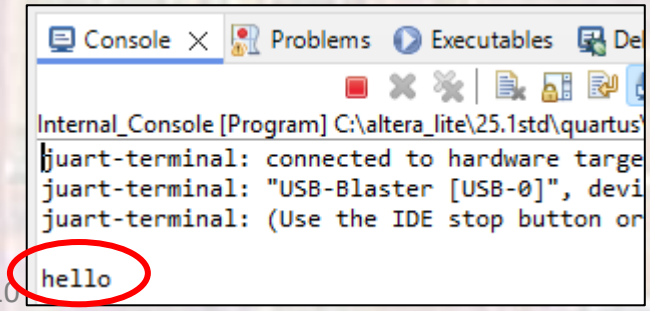


  - Debug
    - Run → Debug As → Ashling RISC-V Hardware Debugging



runs forever – bare metal – no os to return to

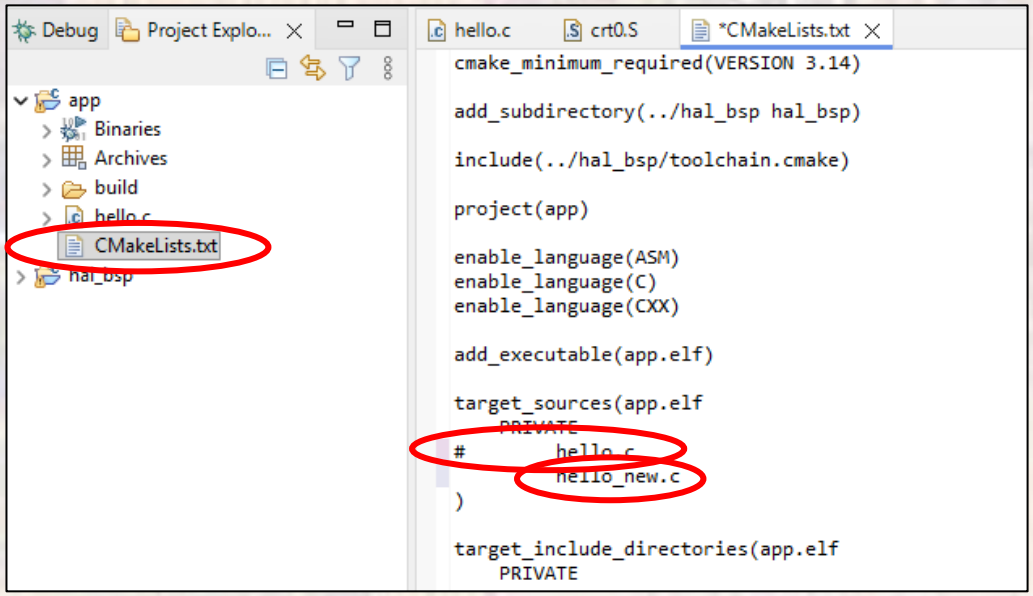




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NIOS-V Running Software

- Modify the program to build
  - Open the CMakeLists.txt file
  - Find the target_sources section
  - Comment out the old file (# is the single line comment character)
  - Add the new file name
  - Save
  - Build the project



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