Goals

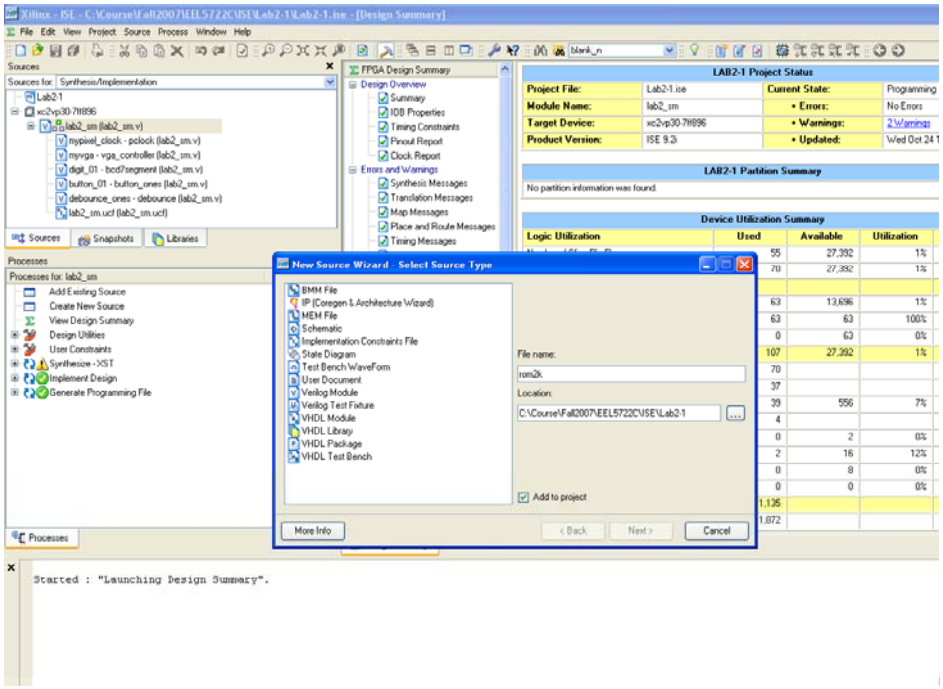
- Learn how to use the FPGA to display PS/2 input on VGA monitor
- Learn how to initialize and use memory on the FPGA

Procedure

- Use FPGA memory to store a character map.
- Use Coregen to generate the memory module, use the given .coe file to initialize the memory content with the character map.
- Instantiate the memory in the top level module and access it using the provided address and data buses.
- Pin assignment:
  - Lab 2 UCF for the VGA.
  - Lab 3 UCF for the keyboard.

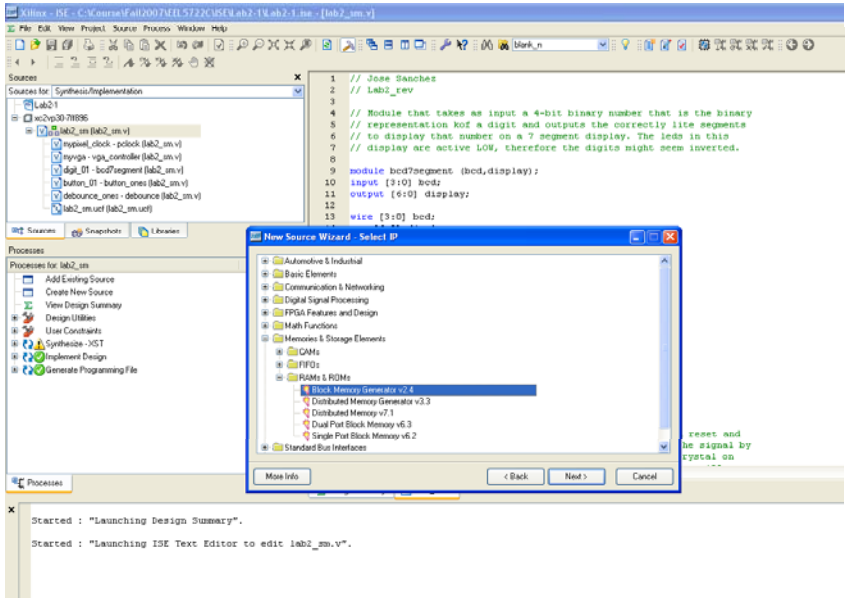
Using Xilinx Coregen

1. Select *Project->new source->IP (coregen & architecture wizard) ->Next*



Using Xilinx Coregen

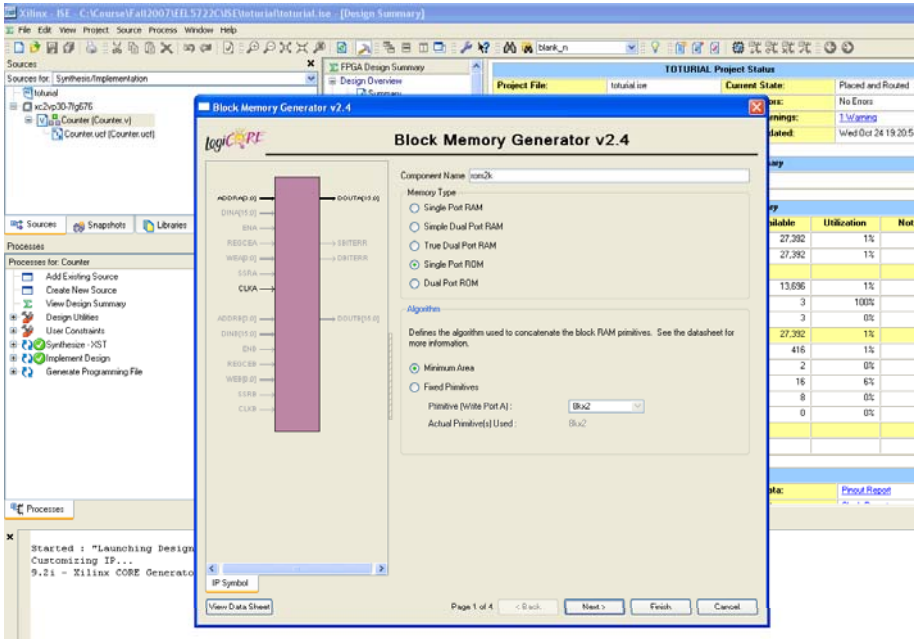
2. Select *Memories & Storage Elements -> RAM & ROM -> Block Memory Generator v2.4-> Next ->Finish*



Using Xilinx Coregen

3. Select *Memory Type: Signal Port ROM*

Algorithm: Minimum Area -> Next



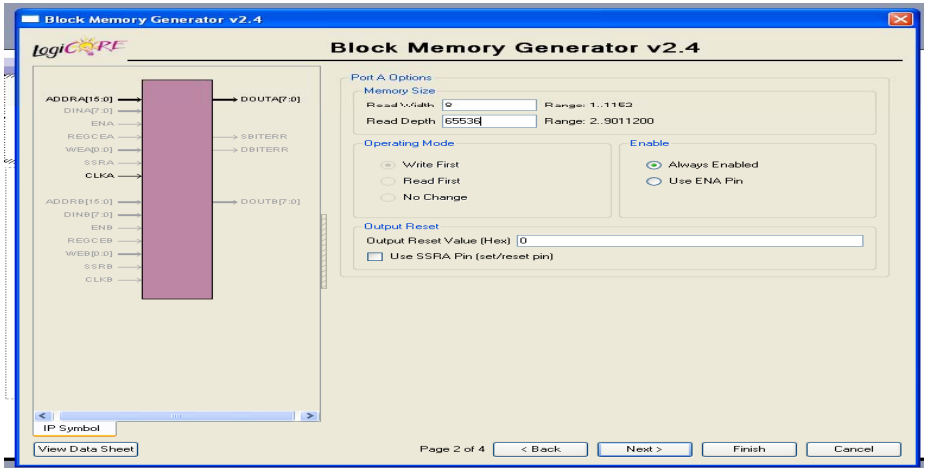
Using Xilinx Coregen

4. Select *Memory size: Read Width:8; Read Depth128; Enable: Always Enable; Output Reset:0 ->Next*

5 Select Initial File using the "Character_map.coe" ->Next->Finish

6. Select Edit->Languages Template-> Coregen-> Verilog Component Instantiation, you can see the new generated core interface definition.

7. Use the core as regular module



Description of Assignment

- Use the Keyboard to get input
- Pressing any of the number keys (0-9) on the keyboard should display that number in the upper-left corner of the VGA monitor
- Pressing the Enter (Return) Key should clear the screen to a blank screen
- Pressing any other key should display the character “E” on the monitor
- You are free to choose the color of the character displayed
- You can use the *character_map.coe* file provided, which defines the “font” for the characters