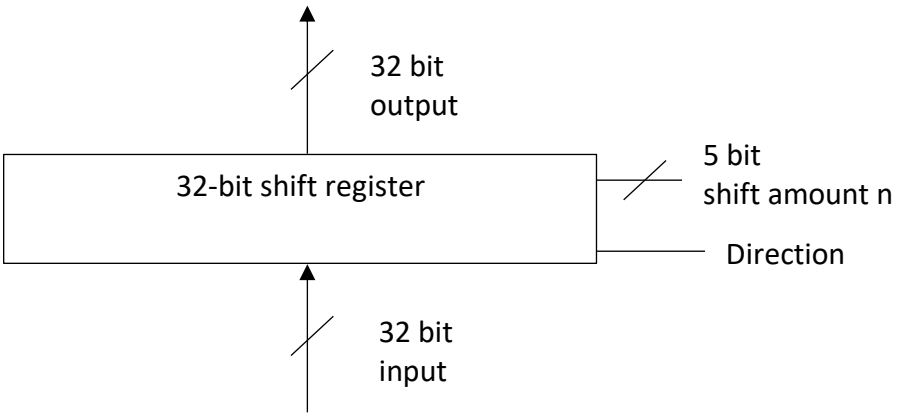
CS2100 Recitation 5
Extra Exercises

1. In the Datapath lecture and later in the Control lecture we see how we can implement beq using the isZero line from the ALU. The MIPS assembler implements blt as a pseudo-instruction.
    a. Discuss how we can use the ALU to implement blt in hardware instead of as a pseudo-instruction in the ALU.
    b. Looking ahead at the Controls lecture, discuss how to fully implement the blt operation in the MIPS datapath.

2. The diagram below shows a device called a "shift register" that takes a 32-bit input and produces a 32-bit output. The output is controlled by a 5-bit "shift amount" input and a 1-bit "Direction" input.



Input	**Description**
5-bit shift amount n	For n<>0, Shifts the input 2^n bits to the left or right. When n==0, does not shift.
Direction	0 = shift left, 1 = shift right.

Describe the changes required to the MIPS datapath to implement the sll and srl instructions. You are not required to discuss how to implement the Control unit for these operations.