Please review the “RTL Primer” handout located on the course website before completing this homework.

1. Please produce the RTL for the OR instruction of the atmega328. Your RTL should only partition the instruction into the FETCH and EXECUTE phases.

   FETCH:
   PMAR <= PC
   assert READ of PMEM
   PMDR <= PMEM[PMAR]
   IR <= PMDR
   PC <= PC + 1

   EXECUTE:
   IF IR[15:10] = 001010
   ALU1 <= R[IR[8:4]]
   ALU2 <= R[{IR[9],IR[3:0]}]
   assert OR of ALU
   R[IR[8:4]] <= ALURESULT

2. Please produce the RTL for the NEG instruction of the atmega328. Your RTL should only partition the instruction into the FETCH and EXECUTE phases.

   FETCH:
   PMAR <= PC
   assert READ of PMEM
   PMDR <= PMEM[PMAR]
   IR <= PMDR
   PC <= PC + 1

   EXECUTE:
   IF {IR[15:9],IR[3:0]} = 10010100001
   ALU1 <= R[IR[8:4]]
   assert NEG of ALU
   R[IR[8:4]] <= ALURESULT