Computer Science 240
Sequential Circuits
Assignment for Lab 5

As you have learned in lecture and lab, flip-flops are **sequential circuits,** circuits whose output depends not only on the present value of its input signals but also on the value of past inputs. This is in contrast to combinational logic, whose output is a function of only the present input (the other circuits you have studied up to this point, such as basic gates, multiplexers, decoders, and ALU).

Because latches and flip-flops can store a state of 0 or 1, they are used as 1-bit memories, and can be used to create larger, n-bit memories such as registers and RAM. We will investigate these circuits in lab this week, and use them in our implementation of an instruction set architecture.

1. Write a short description of each of the following devices (use your notes from lecture or the notes from lab this week as a reference).

    a. Register

    b. Register File

    c. RAM

2. Flip-flops are also used for solving problems which can be described by a Finite State Machine. Go to the following link:

   http://www.cs.princeton.edu/courses/archive/spr06/cos116/FSM_Tutorial.pdf

   which steps you through the process of solving a simple problem of this kind.

  Read the example carefully, and write a short synopsis: