VE270 Lecture 13 RTL Design

Components

- Controllers (FSM)
  - Describes behavior of circuits
  - Takes inputs, generates outputs
  - Implement with **state register** and **combinational logic**
- Data-path components
  - Operations on data
  - Path that data flows through
  - Places data is stored
- Digital Device
  - Controller and data-path components work together.
  - Implementation of an algorithm
  - Design on Register transfer level

RTL Design Method

Capture a high-level state machine

Describe the system's desired behavior as a high-level state machine, consists of states and transitions. It is more than just Boolean operations on bit inputs and outputs.

Create a data-path

Create a data-path to implement data operations of the high-level state machine.

Connect the data-path to controller

Connect data-path to controller block. Connect external Boolean inputs and outputs to controller.

Divide the controller's FSM

Convert high-level state machine to FSM. Replace data operations with setting and reading of control signals to and from the data-path.