It is often helpful to simulate finite-state machines. One of the available simulations is Matt Chapman’s Java application. With such simulations, you may define the automaton and then watch the state transitions as a sequence of input values are processed. His diagrams merge pairs of arrows between two states into a single two-headed arrow. The input label for a transition is written next to the arrow head (closer to the new state). It is not possible to label states using this simulation.

Figure 9.5 shows a simulation for Example 9.8 after it has processed the string 11010.

9.2.2 Finite-State Machines with Output

A second type of finite-state machine is one for which each transition has an associated output. The output might provide feedback about the current state of the machine (as in the vending machine example presented shortly), or as a stream of information that is the purpose for creating the machine (as in Example 9.10).

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10 It is available at http://www.mathcs.bethel.edu/~gossett/DiscreteMathWithProof/ in the “Downloads” section.

11 This is not ideal. In particular, it makes it harder to determine which input symbols go with which direction. However, for a student project, this simulation is impressive.