To illustrate how easy it is to make changes to this implementation, let's consider these three modifications. To make it spin in the other direction, we simply change pointers to sequence in the other direction. We could also add additional input pins and make it perform other commands. To make it travel at a different speed, we change the wait time.

CHECKPOINT 10.4

If the stepper motor were to have 36 steps per rotation, how fast would the two motors spin using Program 10.7?

Hide Answer

Speed = (1 rotation/36 steps)*(1000ms/s)*(60sec/min)*(1step/20ms) = 83.3 RPM

CHECKPOINT 10.5

What would you change in Program 10.7 to make the motor spin at 30 RPM?

Hide Answer

Change the 50ms to 10ms, and it will spin 5 times faster. Speed = (1 rotation/200 steps)*(1000ms/s)*(60sec/min)*(1step/10ms) = 30 RPM

CHECKPOINT 10.6

Does the robot in the previous example satisfy Asimov's second law of robotics?

Hide Answer

Yes and no. "A robot must obey the orders given to it by human beings, except where such orders would conflict with the First Law." This robot does exactly what its human programmer tells it to do. But it does not obey verbal orders given to it like the robots in Asimov's books.

Performance tip: Use a DC motor for applications requiring high torque or high speed, and use a stepper motor for applications requiring accurate positioning at low speed.

Performance tip: To get high torque at low speed, use a geared DC motor (the motor spins at high speed, but the shaft spins slowly).

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