Embedded Real-Time Systems (AME 3623)
Homework 4

April 21, 2007

This homework assignment is due on Friday, April 27th at 5:00pm. Your work may be handed in electronically (use the **Homework 4** digital dropbox on D2L) or in hardcopy form (in person or to my office).

This assignment must be done individually: do not share/discuss your answers with others or look at the answers of others.

Question 1

1. (10pts) Briefly explain the need for *buffers* in communication.

2. (10pts) Define the "shared data problem."

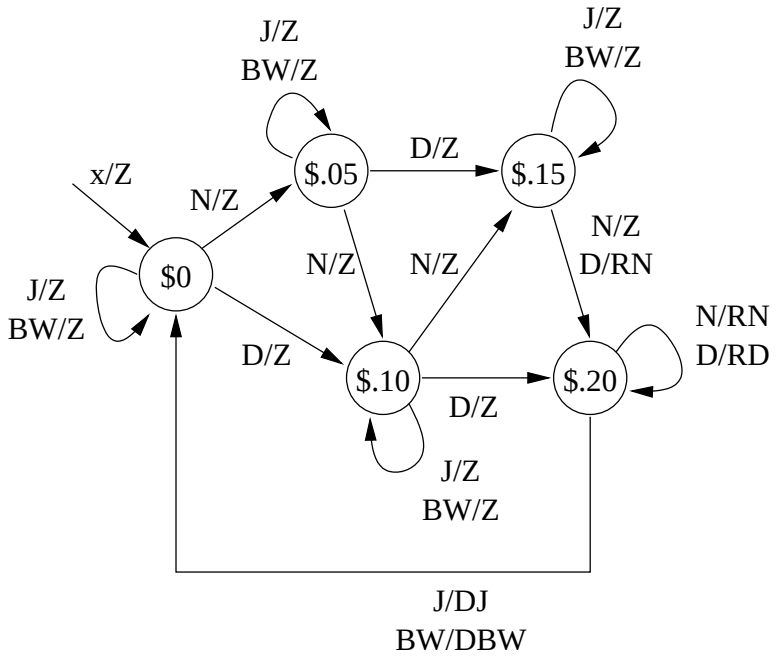
Question 2

1. (15pts) Suppose we want a small segment of code – called $donow()$ – to be executed precisely once every $1.664ms$. What is the timer0 prescalar configuration and the (psuedo)code for the interrupt routine (the code does not need to be syntactically correct)?

2. (15pts) Suppose we want a *donow*() to be called once every 29.3601*sec*. Which timer should we use? What is the prescalar? What is the software divisor? (there are multiple solutions; select the one that minimizes the interrupt frequency)

Question 3

(20pts) Below is the FSM for the vending machine that we discussed in class.



Alter this vending machine such that Buzz Water requires only \$.15 in order to buy it. State any additional assumptions that you make.

Question 4

How much time did you spend on this assignment?