Assignment 8 - A/D and D/A Converters

due Friday, November 14

Question 1

A temperature sensor generates a voltage equal to $1200 + 30T$ millivolts where T is the temperature in degrees C. You need to read this voltage into a computer using an A/D converter. The expected range of temperatures is -30 to +40 C and you need to measure the temperature with a resolution of 2 degrees (± 1 degree). An analog circuit is used to amplify and shift the input voltage so that it covers the full input range of the A/C converter. How many bits of resolution will be required?

Question 2

A D/A converter is used to control the speed of a motor. The motor speed is given by the equation $s = 500 + 1000v$ where v is the D/A output voltage and will vary from 0 to 10 volts. You need to control the speed of the motor to an accuracy of better than 10 rpm. How many bits of resolution should you specify for the D/A converter?

Question 3

Write a C program to *compute* the values of $n!$ from 0! to 7! and then print the resulting values in the reverse order that they were computed.