Homework 3

Engr 134 – Mechatronics II

PING DISTANCE DETECTION, LED, & MOTOR

The Fanuc robot in the engineering lab is equipped with a SAFETY FENCE SYSTEM that detects if someone moves into the robot area. If the robot is moving autonomously and the system senses no one, the robot will run at full speed and the green light is lit. If a person gets SORT of close, the robot slows down and the light turns yellow. If the person gets even closer the robot STOPS and the light turns red.

Set up Arduino hardware as follows. Use an ultra-sonic PING sensor to detect distance. See the CT GUIDE or look online on how to wire that up. Wire up 3 LED's (preferably green, yellow, and red). You'll also need three 220-ohm resistors. Wire those up to 3 different I/O pins. Also wire up the piezo-speaker (see ARDUINO guide on how to operate the piezospeaker).

Write a program that lights up a particular LED based on the distance detected.
Also get the distance (in CM) to show on the serial monitor.
In addition, turn a DC motor at a rate that depends on the distance detected.
And while in the "RED" zone, have the speaker beep repeatedly (like a warning sign)

DISTANCE, d	LED	MOTOR	SPEAKER
> 60 cm (or 0.60 m)	Green	faster	
20 cm < d < 60 cm	Yellow	slower	
d < 20 cm	Red	stopped	beeps repeatedly