Embedded Systems (CS [45]163)
Homework 2

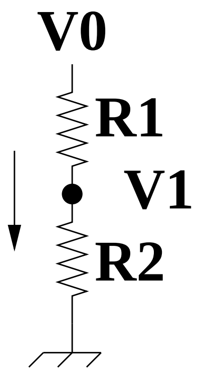
March 18, 2009

This homework assignment is due on Thursday, March 12th at 5:00pm. Your work may be handed in electronically (use the **Homework 2** digital dropbox on D2L) or in hardcopy form (in person or under door).

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

Question 1

Consider the following circuit:

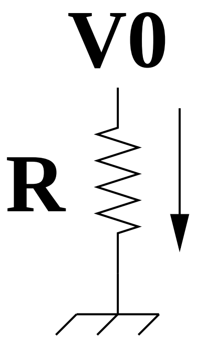


Assume $V0 = 5V$.

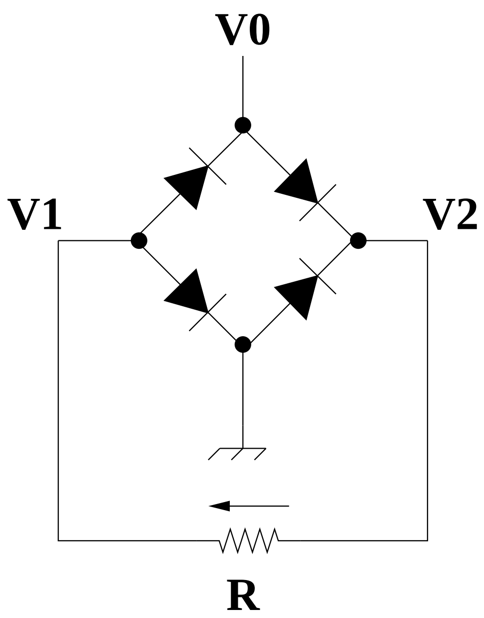
1. (10pts) Assume $R2 = 100\Omega$. Show $V1$ and I as a function of $1\Omega \leq R1 \leq 299\Omega$. Show your derivation.

2. (10pts) Assume $R2 = 300 - R1$. Show $V1$ and I as a function of $R1$ (same range). Show your derivation.

Question 2



1. (10pts) Consider the above circuit. Assume $R = 500\Omega$. Show IR as a function of $V0$. Show your derivation.



2. (20pts) Consider the above circuit. Assume $V_f = 0.5V$ and $R = 500\Omega$. Show IR as a function of $V0$. Show your derivation.

Question 3

Suppose we want to produce a regular interrupt at a period of approximately 32.8 ms. Assume that we are using a 16 MHz crystal for our clock.

1. (5 pts) Which timer should we use?

2. (5 pts) How should we configure this timer?

Question 4

Suppose we want to produce a regular interrupt at a frequency of 1.953 KHz. Assume that we are using a 16 MHz crystal for our clock.

1. (5 pts) Which timer should we use?

2. (5 pts) How should we configure this timer?

Question 5 (ALL)

How much time did you spend on this homework assignment?