ECE 376 - Homework #6

Statistics and Data Collection

Data Collection

1) Use your PIC board to measure the temperature of the room

- Measure the temperature every 2 seconds
- Collect 50 data points
- Plot or list your data

From your data determine the mean and standard deviation.

2) Use a chi-squared test to determine if your data has a uniform distribution over the range of [a, b] where 'a' is the minimum of your data and "b' is the maximum of your data.

Chi-Squred Test

The following code implements a fair die and a loaded die (with the comment removed).

```
while(1) {
    while(!RB0);
    while(RB0) {
        d7 = (d7 + 1) % 7;
        d100 = (d100 + 1) % 100;
        }
     d7 = d7 + 1;
// Loaded Die
// if(d100 < 10) d7 = 7;
     LCD_Move(1,8); LCD_Out(d7, 1, 0);
     SCI_Out(d7, 1, 0);
     SCI_CRLF();
     }
```

3) Collect data for the fair 7-sided die. From your data, what is the probaility that the die is fair?

4) Remove the comment and collect data for the loaded die. From your data, what is the probaility that the die is fair?

5) How loaded does the die have to be for you to be able to reliably detect that something is amiss?

Am I Psychic?

6) Take a coin and flip it 10+ times.

- Each time you flip the coin, predict the result.
- Count the number of times you're right and wrong.

7) Use a chi-squared test to determine if you're just guessing ($p = 0.5$)