# ECE 376 - Homework \#6 

Chi-squared Test. Due Monday, February 27th
Please email to jacob.glower@ ndsu.edu, or submit as a hard copy, or submit on BlackBoard

## Fair \& Loaded Dice

1) Determine experimentaly using a chi-squared test whether or not the following $C$ code produces a fair 6-sided die:
```
while(1) {
    while(!RB0);
    while(RBO) DIE = (DIE + 1) % 6;
    DIE += 1;
    LCD_Move(1,0); LCD_Out(DIE, 1, 0);
    SCI_Out(DIE, 1, 0);
    SCI_CRLF();
    }
```

2) Determine experimentaly using a chi-squared test whether or not the following $C$ code produces a fair 6-sided die:
```
while(1) {
    while(!RB0);
    while(RBO) {
        DIE = (DIE + 1) % 6;
        X = (X + 1) % 101;
        }
    DIE = DIE + 1;
    if(X < 15) DIE = 6;
    LCD_Move(1,0); LCD_Out(DIE, 1, 0);
    SCI_Out(DIE, 1, 0);
    SCI_CRLF();
    }
```


## Am I Psychic?

3) Write a C program which tests if you're psychic:

- Each round, predict which number is going to come up (0..3)
- Press the corresponding button RB0..RB3.
- When you release the button, a random number in the range of $0 . .3$ is generated
- If you were right, the PIC records that. Likewise if you were wrong.
- The LCD display displays how many times you were right and wrong.

4) Collect data with your program.
5) Determine the chance that you were not just guessing using a chi-squared test

- Null hypothesis: you are just guessing (correct $25 \%$ of the time).

