**COMP 1587 - CS1 - Error Detection & Control: Exercises**

1. Take the second letter of your first name and convert it to [7-bit ACSII binary](http://en.wikipedia.org/wiki/ASCII#ASCII_printable_characters) code. What bit do you need to add to have even parity?

101 0011(0)  
  
2. Take the first two letters of your country of birth and the first two letters of your first name and convert them in ASCII binary. You should now have a sequence of 28 bits. What bits do you need to add and where for LRC with odd parity

B R U S

1000010 10110101 10101011 101 00111

3. In a stop-and-wait error control system, Station A sends packet 0, it arrives without error, and an ACK is returned, but the ACK is lost. What happens next?   
send it again

4. What is the hamming distance between 1000110 and 0011110?

1000110

0011110

1011000 = 3  
5. i) What is the hamming distance of the following code:

|  |  |
| --- | --- |
| A | 010010 |
| B | 110100 |
| C | 011001 |
| D | 101010 |
| E | 111111 |
| F | 000000 |
| G | 010101 |

For this, do the hamming distance for each and make a table out of it.  
 ii) For the code above, is it possible for an error control system to detect and correct two errors?

Yes.

Hamming distance D+C+1

Therefore, whatever the outcome, add the humming distance between the two e.g. D = 2 and C = 3 then it would be 6.