# **Number Sorting Assignment:**

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## Flowchart:

A close up of a map

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## Reflection of what I have learned:

In this assignment I learned how to create an array that stores 50 random numbers between 0 and 255 and then sorts them out in ascending order, how to find the highest and lowest numbers and how to convert the highest and lowest to binary to then be displayed on 8 LED’s using multiple functions to make my code more efficient.

## Encountered Issues:

In this assignment I encountered countless problems and headaches. The first one being how to create a random array of 50 numbers between 0 and 255. Once I got that working and it displaying on the serial monitor my next concern was how to make them in ascending order, though I found tons of material online (like with creating a random array) my biggest problem was implementing the material I found and understanding exactly how it works. However, with some help from friends and teachers in the lab I was able to do so. Furthermore, once that was all done I spent a good 2 weeks during Easter working out how to convert the highest and lowest numbers to binary. Getting it to then display on the LED’s was relatively easy with some help.

## Explanation of the code:

### setting variables:

I began my code by setting the variables I would need to use during the code.

//creates an array list of 50 random numbers

//creates a int “temp” for storing temporary values.

//creates an int “i” that I will use later in a for loop.

//creates an int “j” that I will use later in a for loop.

//creates an int “n” that I will use later in a for loop.

//creates an int called incomingByte that I will use as an input.

//creates a string where I will store the highest number.

//creates a string to store the lowest number.

//creates a string that I will use to store the results.

A close up of a logo

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### void setup():

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In void setup I told the code:

//creates an array (rand\_array).

// what each pin will be doing, in this case they pin 13 through to 6.

//creates an array (rand\_array) with values between 0 and 225, that loops 50 times

### void loop():

A screenshot of a cell phone

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In void loop I told the code:

//scans for an input from the user.

//if the user inputs “j” into the serial monitor it will run the code sortAscending.

//initialises a loop to run 50 times so that all values in the array are sorted in ascending order and printed to the serial monitor.

//highest value is inputted into the conversionToBinary method.

//lowest value is inputted into the conversionToBinary method.

//if the length of the string is less than 8 it will add a “0” to the length of the string and the new value is printed to serial monitor.

//prints the highest number to the serial monitor.

//prints the lowest number to the serial monitor.

//the value of numHigh (i.e. highest number) is inputted into the LED method.

//the value of numLow (i.e. lowest number) is inputted into the LED method.

### void sortAscending():

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In void sorAscending I told the code:

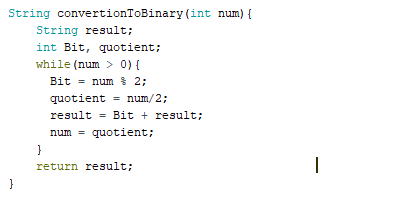
//for loop to run the code 50 times.

//for loop to start 1 position ahead of the other.

//searches if the current int in the array (starting from 0) is larger than the following int.

//essentially a bubble sort which runs into the array is fully sorted into ascending order.

### string convertionToBinary(int num):



In string convertionToBinary I told the code:

//converts an int into a binary number.

//creates an int bit and quotient.

//while the num is > than 0 do:

//finds the modulus.

//input is divided by 2.

//resulting in a binary string which is returned.

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void LED(String num):

//checks for an inputted binary string.

//checks if the length is 8.

//checks if each character is a 1 or a 0.

//1 = High in binary.

//0 = Low in binary.