Serial Ports

Embedded Software

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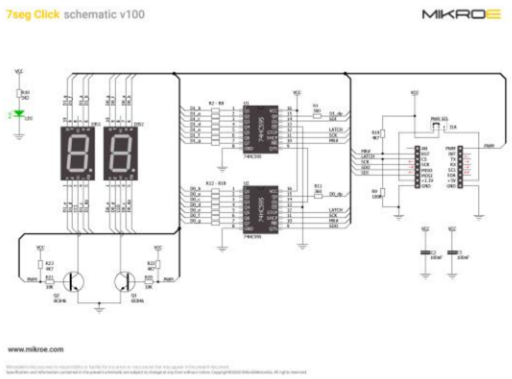
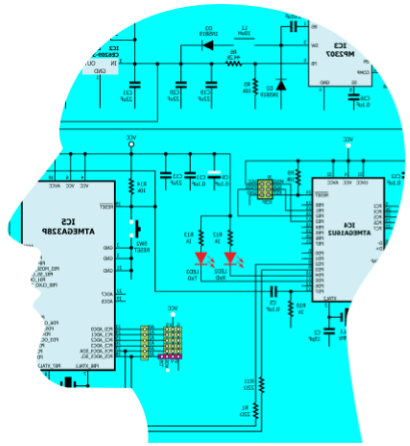
Assignment 1

- Analysis of the Schematic
  - Please analyze the schematic of the 7seg Click. The central component is the 74HC595. Consult the datasheet to find out how it works.

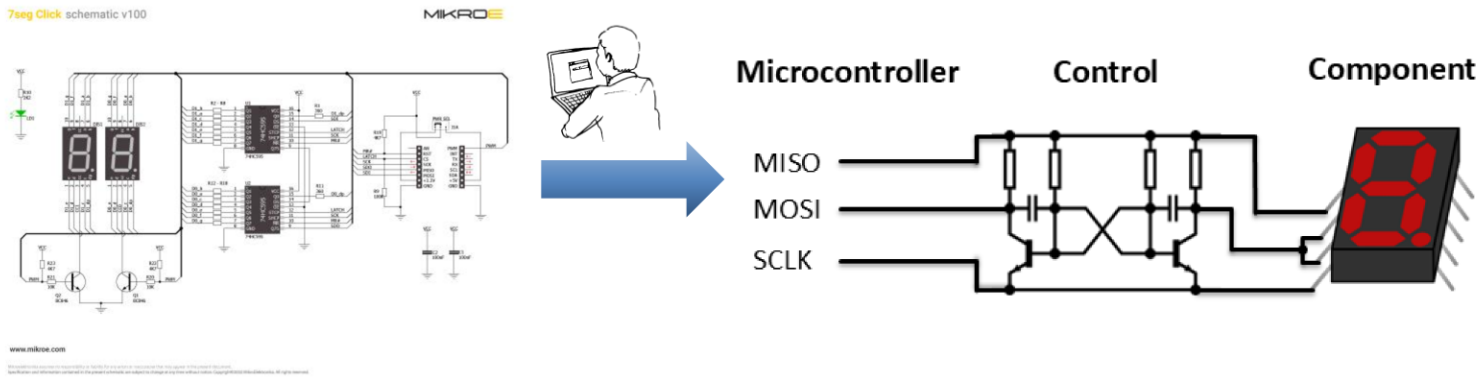


Reference: https://www.mikroe.com/7seg-click



Assignment 2

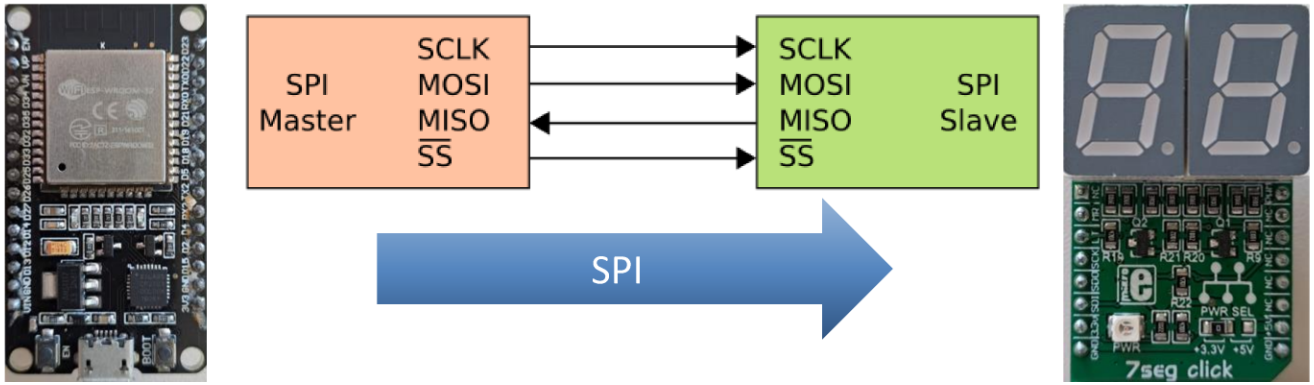
- Creating a Programmer's View
  - Please transform the electrician's view of the schematic into a programmer's view.



Reference: https://www.mikroe.com/7seg-click

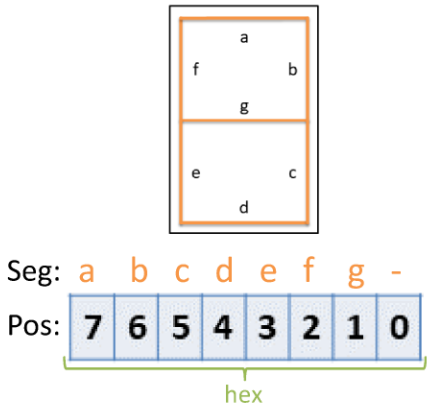
Assignment 3

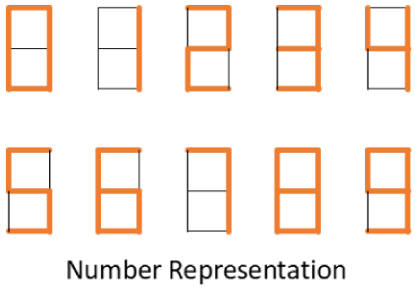
- Creating some Output
  - Please let some segments glow by sending some data to the 7seg Click via SPI.



Assignment 4

- Mapping Segments to Bit Positions
  - Please map the seven segments of the display to the bit positions of the SPI data byte. Create a table with the hex representation of all digits.





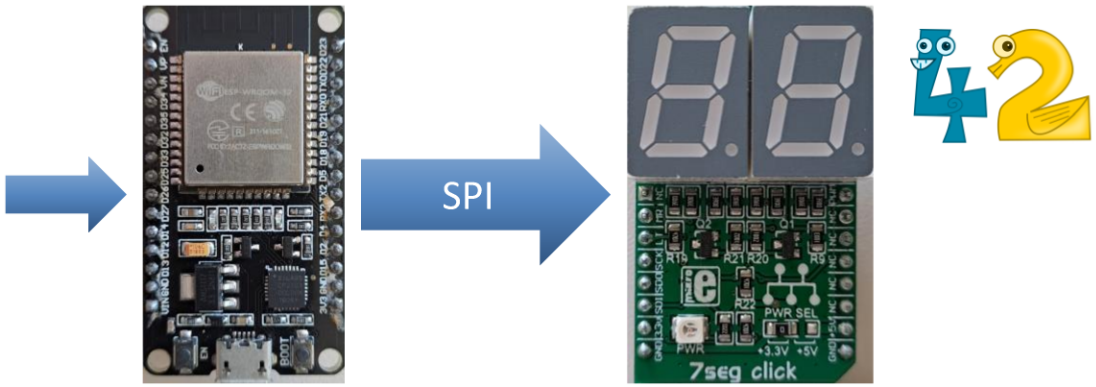
Number	Hex Representation
0	0x…
1	0x…
…	…
8	0x…
9	0x…

Assignment 5

- Displaying Numbers on the Display
  - Please write a program which displays a double figure. Define a number in your program and compute the figures for the two positions.

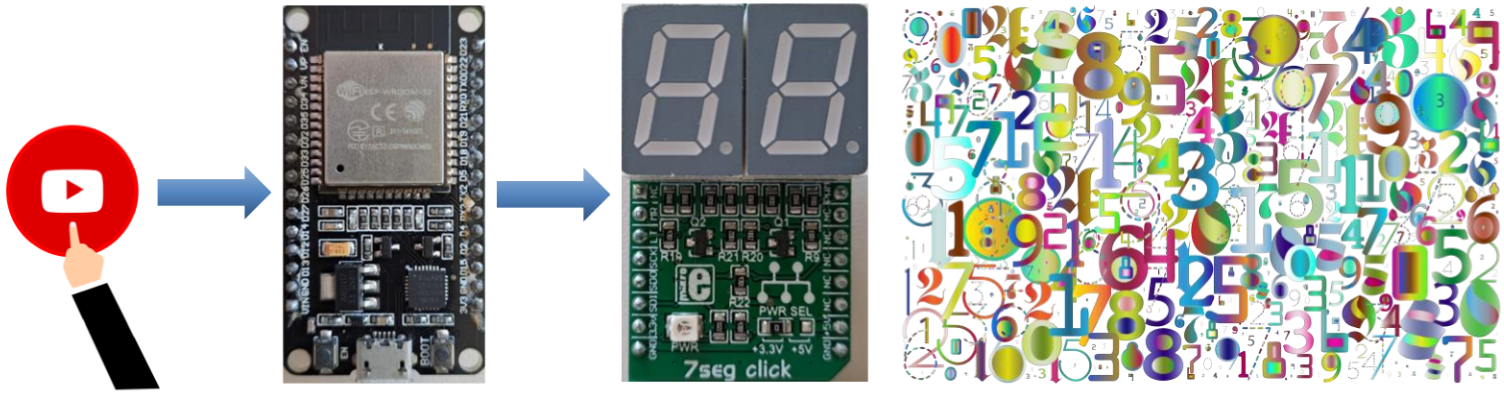
```
#define n 42

const int n = 42;
```



Assignment 6

- Bring more Action into your 7seg Click
  - Bring more action into your 7seg Click by means of push-buttons or a trim-pot. How about a count-down or the like?



Assignment 7

- A Programming Library for the 7seg Click
  - Please create an Arduino library for the 7seg Click so that other programmers can easily use this module on Arduino.

```
#include <disp.h>

void setup()
{
  disp.begin();
}

void loop()
{
  disp.on();
  disp.show(42);
  disp.off();
}
```