Pokemon Forever: a Game Boy Reader and Writer

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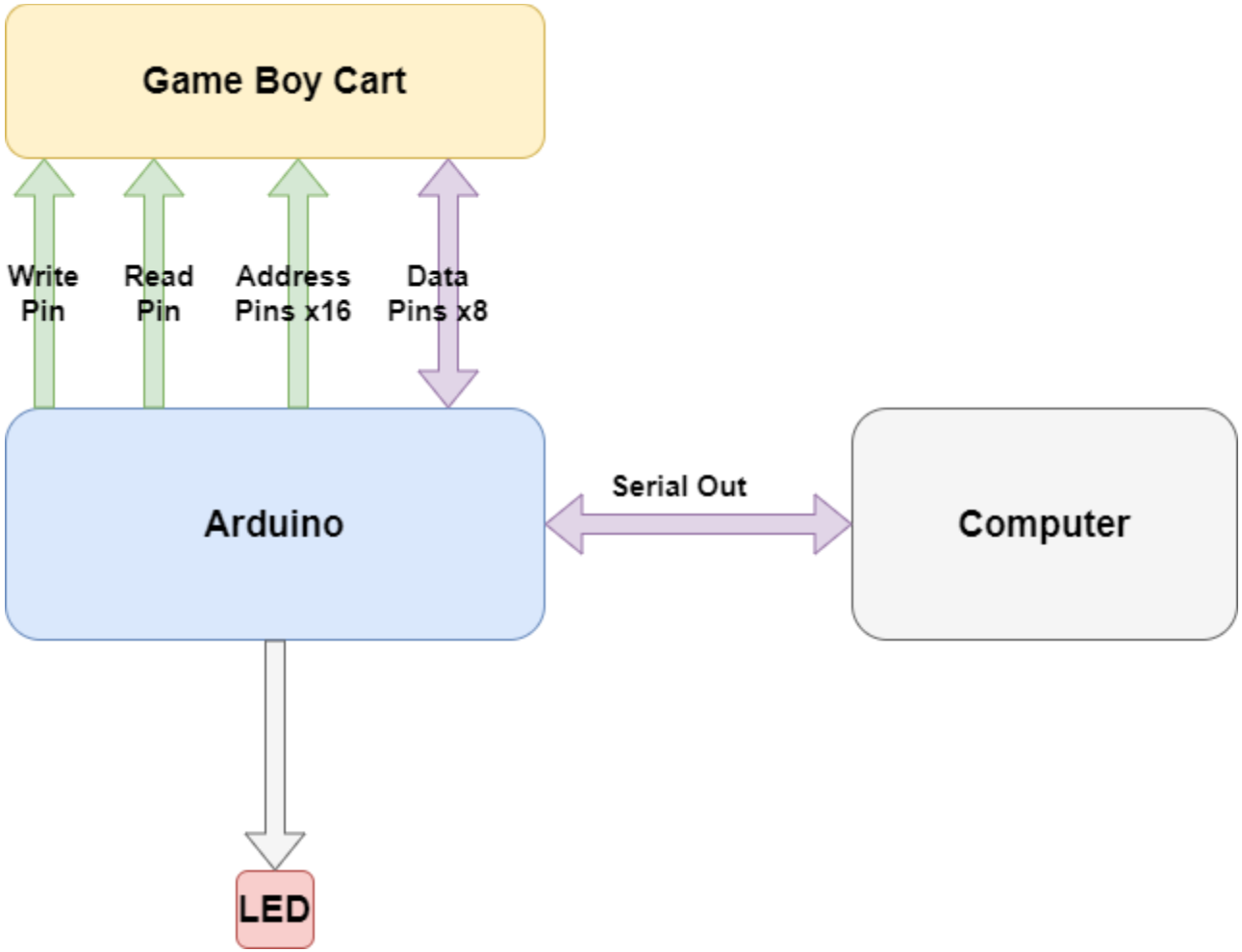
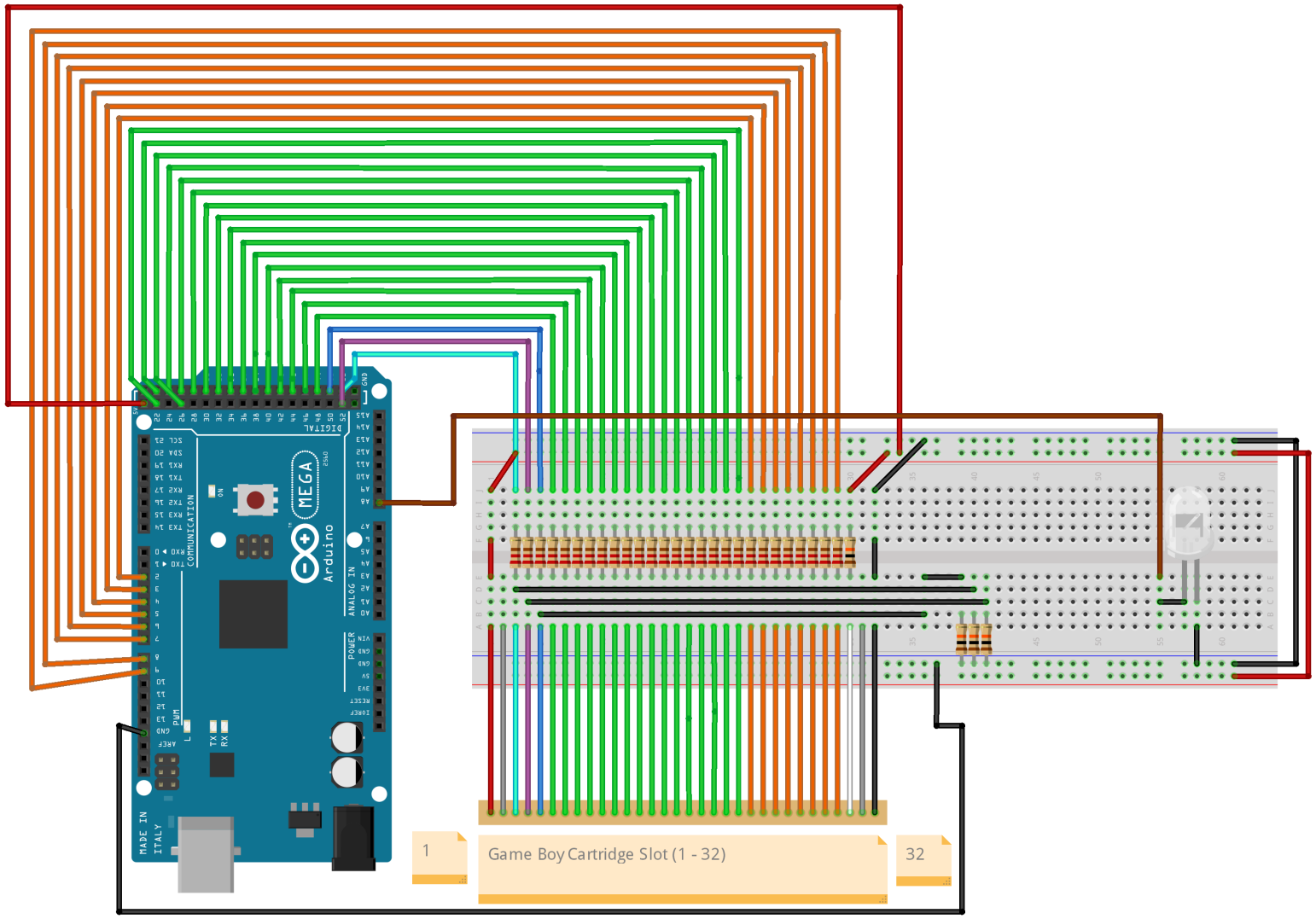
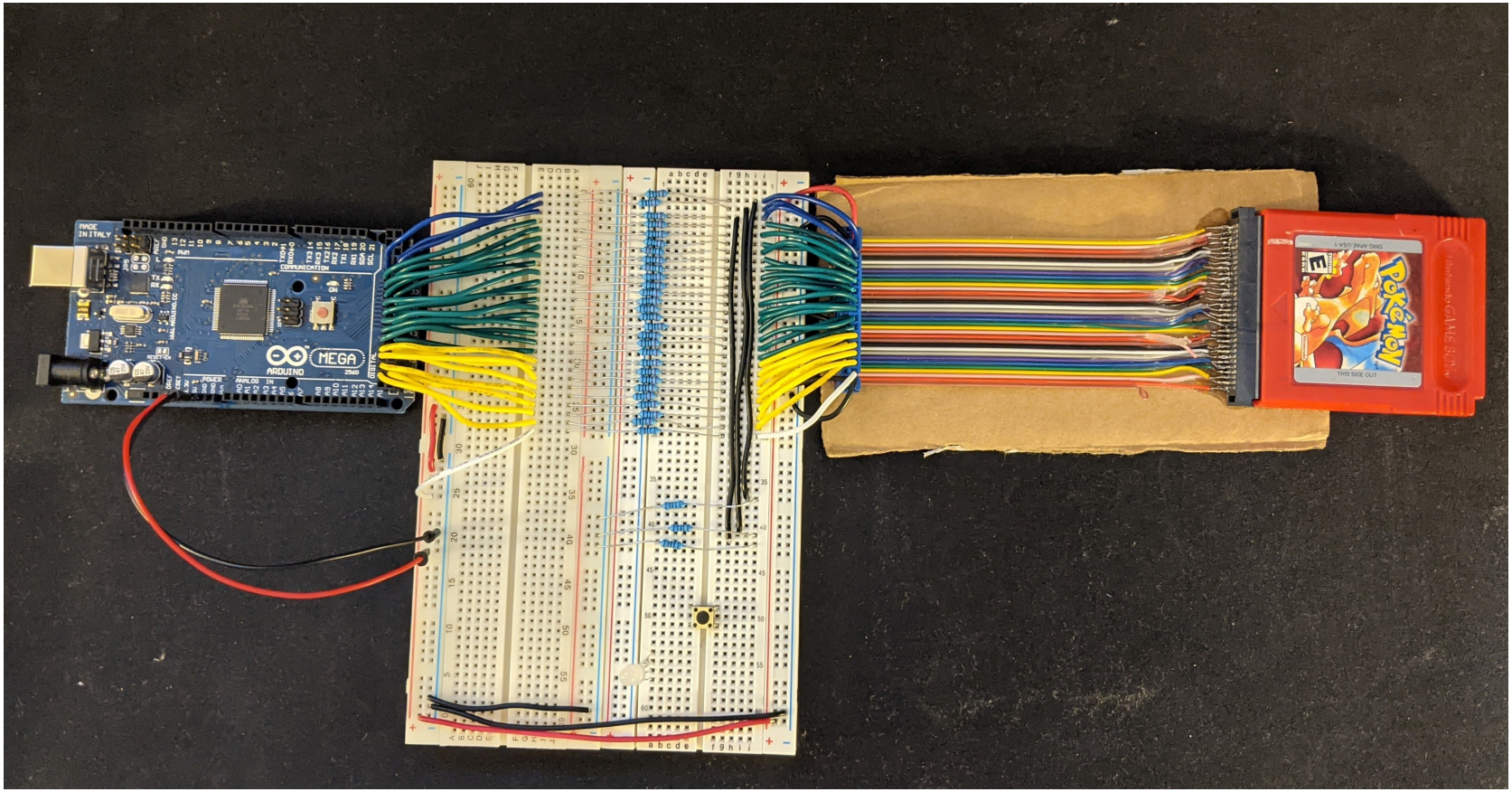
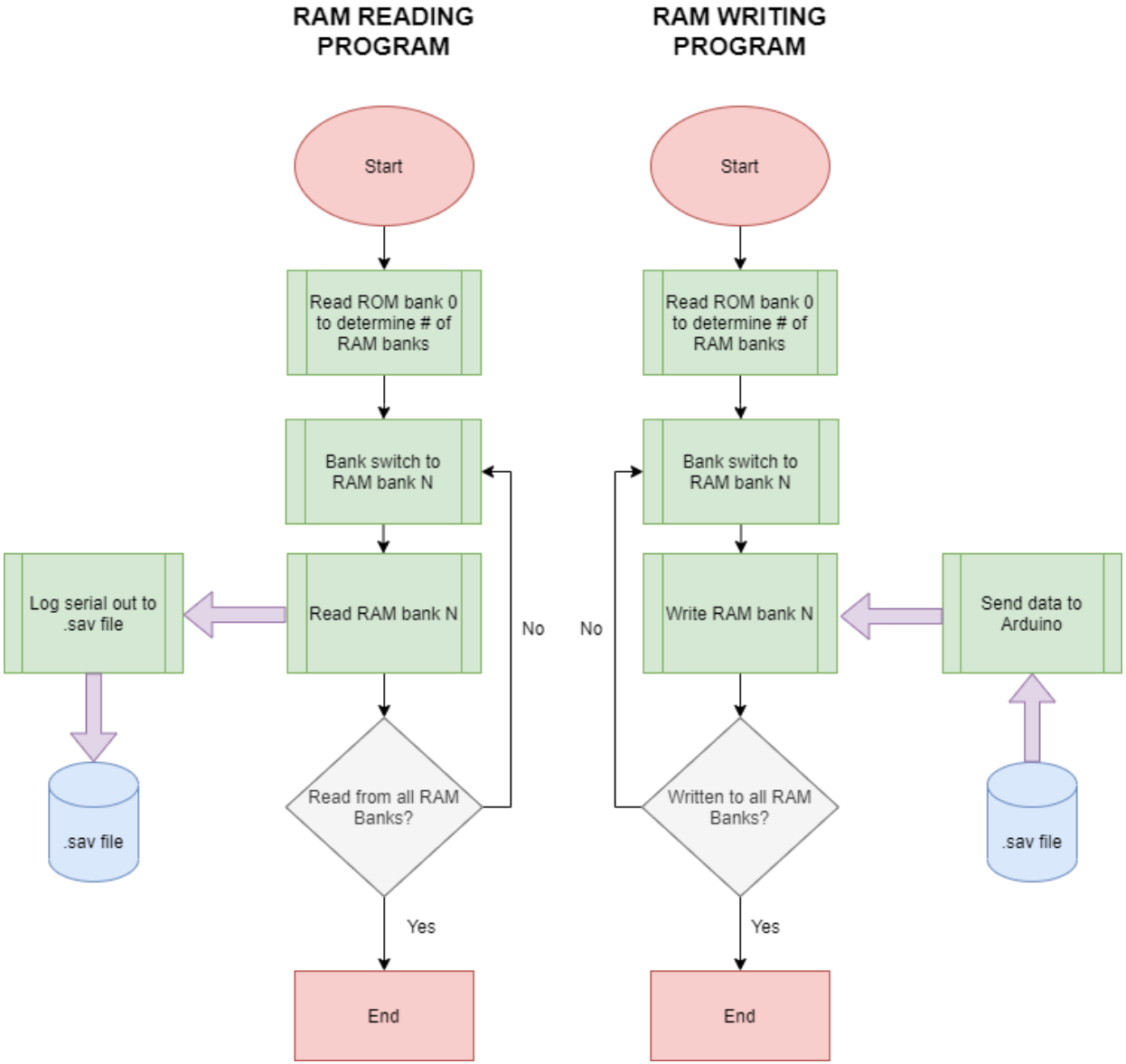
General Idea

- Game Boy Cartridges (Carts) used volatile memory for save states
  - Require a battery
- Need a way to save my game while I'm changing battery in the cart
- Going to attempt to use an Arduino (microcontroller) to make a Reader/Writer for my Game Boy saves


Game Boy Cart
Write Pin
Read Pin
Address Pins x16
Data Pins x8
Arduino
Serial Out
Computer
LED


MEGA
Arduino
1
Game Boy Cartridge Slot (1 - 32)
32


MADE IN ITALY
MEGA
ARDUINO
Pokémon
THIS SIDE OUT



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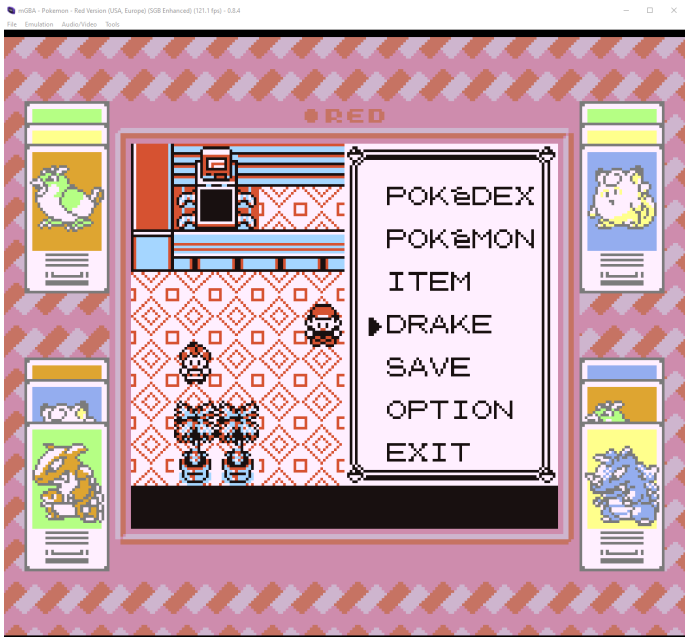
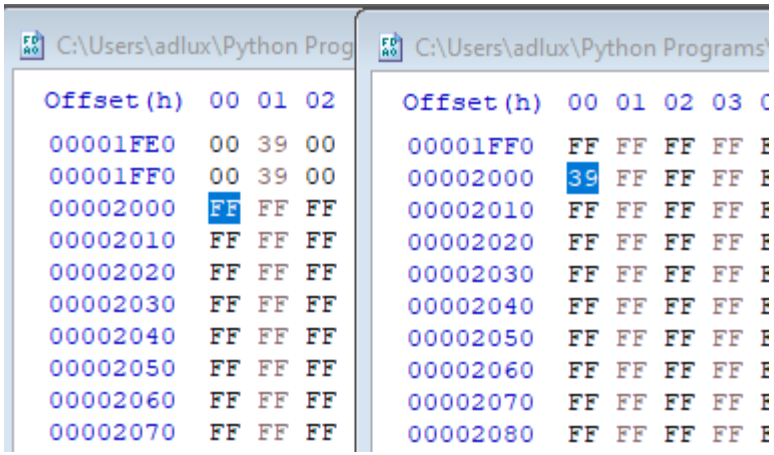
Does it work?



- Reading works great!
- Writing currently isn't playing nice
  - 2nd Bank of RAM gets phantom byte; shifts RAM by 1 byte



```
// Switch banks (32Kbytes)
  for (int bank = 0; bank <= 3; bank++) {
    //Begin bank switching
    // send 0x4000
    address(0x4000);
    delayMicroseconds(50);

    // Set D0-D7 pins as outputs
    for (int l = D0; l <= D7; l++) {
      pinMode(l, OUTPUT);
    }

    if (bank & 1) {
      digitalWrite(46, HIGH);
    }
    if (bank & 2) {
      digitalWrite(47, HIGH);
    }

    // Tell MBC to process our RAM bank request
    digitalWrite(wrPin, LOW); // WR 0
    digitalWrite(wrPin, HIGH); // WR 1

    // Turn outputs off and change back to inputs
    for (int l = D0; l <= D7; l++) {
      digitalWrite(l, LOW);
      pinMode(l, INPUT);
    }
```

```
  // Read RAM
  for (addr = 0xA000; addr <= 0xBFFF; addr++) {
    address(addr);
    delayMicroseconds(50);

    // Tell MBC to process our RAM request
    digitalWrite(cpsel, LOW); //MREQ on
    digitalWrite(rdPin, LOW); // RD on

    byte byteval = 0;
    for (int z = D7; z >= D0; z--) {
      if (digitalRead(z) == HIGH) {
        bitWrite(byteval, (z-D0), HIGH);
      }
    }

    // Done reading this part of RAM
    digitalWrite(cpsel, HIGH); //MREQ off
    digitalWrite(rdPin, HIGH); // RD off

    Serial.println(byteval, DEC);

  }
```

```
void address(word addr){
  for(int i = 0; i<16; i++){
    int pin = 30+i;
    int bitval=bitRead(addr,i);
    digitalWrite(pin,bitval);
  }
}
```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```
// Write RAM
for (addr = 0xA000; addr <= 0xBFFF; addr++) {

  //send address to gbcart and wait
  address(addr);
  delayMicroseconds(50);

// Tell MBC to process our RAM request
  digitalWrite(cpsel, LOW); //chipselect on
  digitalWrite(wrPin, LOW); // write on



  //Wait for input byte from serial
  while(Serial.available()<=0){
    delay(1);
  }

// Decode input
byte bval = 0;
if (Serial.available() > 0) {
  char c = Serial.read();
  bval = (int) c;
}

// Read the bits in the received character and turn on the
// corresponding D0-D7 pins
for (int z = D7; z >= D0; z--) {
  if (bitRead(bval, z-D0) == HIGH) {
    digitalWrite(z, HIGH);
  }
  else {
    digitalWrite(z, LOW);
  }
}


  Serial.println(".");//send something to comp to update progress

  // Done writing this part of RAM
  digitalWrite(cpsel, HIGH); //MREQ off
  digitalWrite(wrPin, HIGH); // wr off
}
```