FTG Team 4005 Programming

Section 1 Logic

1. Transistors - Basic function of a transistor
    a. Building block of all modern processors
2. Transistors combined to create logic blocks
    a. Different logic types, truth tables etc.
3. Logic blocks combined to create ALU
    a. Every modern computer is based off of this
4. ALU instructions (machine code)
    a. How does an ALU process data
    b. How does this pertain to C and C++
5. Assembly instructions
    a. The way code was and still can be written
    b. How does this pertain to C and C++

Section 2 Microcontrollers

1. Basic structure of a microcontroller
    a. How does the ALU get instructions
    b. Registers
    c. How are the instructions stored
    d. How is data stored
    e. Different types of memory
    f. Memory layout

Section 3 C and C++

1. Pointers Why and how
    a. Data pointers
    b. Code pointers
    c. How they are passed around
    d. How to update pointer
    e. How to update data pointed to
2. C and C++ start
    a. Early history of C and C++
    b. Memory usage for program
    c. Difference between stack and heap
    d. How does memory get allocated for data / variables
    e. Objects C++ as related to structures in C
    f. Early C code using pointers to structs
    g. C malloc and calloc as related to new in C++
    h. Memory leaks C++ new and delete
    i. When to use new in C++