

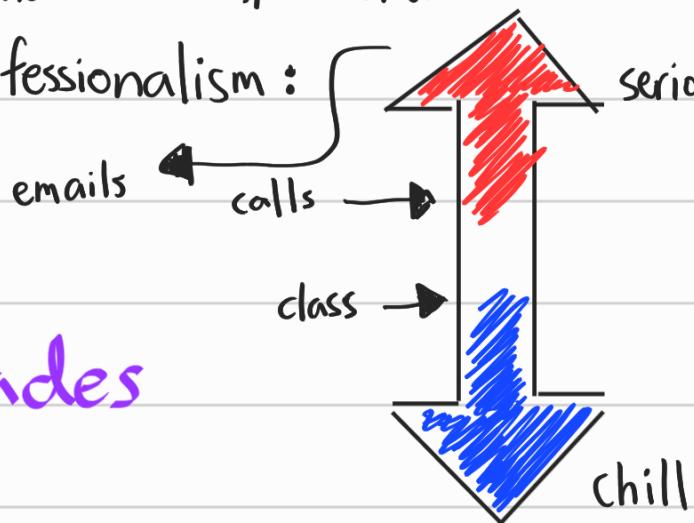
Was the space I put the instructors contact info but I don't think they want that on the internet

Quick Rules

If its not in on time its a zero.

No attendance is taken, proof of work must be sent.

levels of professionalism :



Possible Grades

90 - 100 = A

80 - 89.99 = B

70 - 79.99 = C

60 - 69.99 = D

59 and below = F

The Art of Exploitation

-book recommendation

by Joe

Test taking strategy :
-by Michael--

- Go to bed way early
- Breakfast out
- The more you relax the better
- Analyze the question
- Narrow answers down

Hypothesis
Test
Observe
Analyze
Conclusion

Scientific Method

October 7th is the absolute deadline of the 1st 8 weeks

Virtual Machine - essentially a computer in a computer, can be used in case something might go wrong then you can wipe the system without wiping the computer

RSA - (Rivest, Shamir, Adleman) Type of Cryptography, 2 keys one will encrypt and one will decrypt, Cryptography that secures everything

Git Hub - porn hub but the sexy shit is the code, you can store code and see what other people do

Repository - just like a library is a repository for books, you can have a reposat → ode, it holds information

Parts of a Computer:

CPU - stands for central processing unit, it is the general processing unit

there are two major companies which are AMD + Intel (Michael is partial to AMD)

it is a metal rock looking thing that electricity goes through and silicon, which
is part of the structure. Commonly said "metal rock that teaches sand to think."

If you think of it as a body and their parts working together, the CPU is the
brain. The silicon is also a great insulator.

Motherboard - sometimes shortened to mobo, holds the parts in place and is where
everything gets plugged in. The motherboard can be thought of as the body
of the system.

RAM - Stands for Random Access Memory, it is the short term memory of
the system. Power must be continuously going to it. It looks like a row of square
black chips: that's what is storing the information. (If going to buy Michael says get
32gb to make sure it will run smoothly)

Storage - It is the long term memory of the system. There are two
kinds: hard drive and solid state drive. Michael is salty so that's why he calls
hard drives spinning rust. It is a little outdated and slow but can hold a ton of info
with a life span of 3-5 years. The Solid State Drive is the new sexy shit that has a high processing
speed but a large and limited capacity.

Graphics - Also known as GPU - graphical processing unit, its intent is to render
graphics. Graphics is just a bunch of math using RGB so programmers have learned to capture this

processing power to create password cracker.



(excited highlighter noises)

Case - contains the units, can be used to cool.

PSU - stands for power supply unit

Extra Notes :

- There is a standard for computers so that different parts fit together. The standard is the ATX standard, standing for Advanced Technology eXtended
- Passwords are not stored as passwords on computers. That information would be too easy to steal. They are stored two different ways : encryption and hashing. These are both sub categories of Cryptography. Encryption is like a two way door. The data can be stored as well as accessed. It is not secure because it is accessible. Hashing stores the information but keeps it secure it can not directly say what the password is but can tell you whether or not it is correct. It's a way to record without recovery.

PCIE - stands for peripheral component interconnect express, it is the slot for the graphics card. The PCIE is 16 bit and smaller, while the older version known as PCI is larger and 8 bit.

- Video card and Graphics card are they same thing
- Clock Speed - Hertz used it, means rotation per second. He used it to describe light. So clock rate is talking about something in Hertz. An example is something having a clock speed of 360. This represents how many operations per second.

Intro to Binary

binary - computer language using 1's and 0's, in base 2

one # = one bit

eight bits = 1 byte

"1" → one bit

"1011" → one nibble

"10101100" → one byte

$$\begin{array}{r} \underline{128} \quad \underline{64} \quad \underline{32} \quad \underline{16} \quad \underline{8} \quad \underline{4} \quad \underline{2} \quad \underline{1} \\ 2^7 \quad 2^6 \quad 2^5 \quad 2^4 \quad 2^3 \quad 2^2 \quad 2^1 \quad 2^0 \end{array}$$

↑

each place increases by one in exponential notation

Decimal	Binary
1 =	00000001
2 =	00000010
4 =	00000100
8 =	00001000
16 =	00010000
32 =	00100000
64 =	01000000
128 =	10000000

Decimal	Binary
192	11000000
224	11100000
240	11110000
248	11111000
252	11111100
254	11111110
255	11111111

People v.s. Computers

People count what is physically there while computers count empty spaces as well as what is present. Example:

computers start at zero

Michael holds markers.
How many is he holding?
person : 2

computer : 1
↳ started at zero

Hexadecimal

When numbers start getting bigger, binary becomes less efficient. We use hexadecimal to combat this. Base 16

Normal binary code comes in 8 digit sequences, Hexadecimal breaks this into 2, 4 digit segments

example: 00100000
 ↓ ↓
 2 0 = together equals 2

Translation

Counting in Hexadecimal

B	D	H	B	D	H
0000 = 0 = 0			1000 = 8 = 8		
0001 = 1 = 1			1001 = 9 = 9		
0010 = 2 = 2			1010 = 10 = A		
0011 = 3 = 3			1011 = 11 = B		
0100 = 4 = 4			1100 = 12 = C		
0101 = 5 = 5			1101 = 13 = D		
0110 = 6 = 6			1110 = 14 = E		
0111 = 7 = 7			1111 = 15 = F		



When translating binary to Hexadecimal, always start at the end. Create groups of four. If there are remainder numbers, add implicit zeroes to complete the nibble.

Example:

1 3 6 C E 6
0001 0011 0110 1001 1100 0011 0110

Step 1: start at end

Step 2: break apart into nibbles

Step 3: take remainder and add

implicit zeroes to complete the nibble

Step 4: translate

Step 5: employ concatenation

1 3 6 C E 6 (push together)

therefore: 100110110110011100110 =

136CE6

hexidecimal is far more concise

Practice Problems



★ convert from binary to hexidecimal

1 01000101

2 10101010

3 11001011

4 11111111

5 00001111

6 10000101

7 00110101

8 10100000

9 000000010

10 10000000

★ convert from decimal to binary

1 110

2 173

3 13

4 121

5 245

6 44

7 200

8 72

9 31

10 100

