> Fun stuff:

Low level! UIUC programmers don't just program in python/js, they could *write* python/js

Powerful! Create things that others will use. Make programs that others can only dream of.

> Be the master of

Know your tools. C Programming / System programming is brutal if you don't know the details.

Concurrency (muli-threading, multi-process)

Synchronization

Signals

Critical Section

Race Conditions

Deadlock

Analysis of Reader-Writer, Dining Philosphers, Producer Consumer

0. Spot the difference
```
char* a = "Arghhh";
char b[] = "Pieces of 8";
*b = 0;
*a = 0;
```
→ Seg-fault

1. c library vs system calls.
```
printf("Hello %d",cs241);
puts("World");

const char*ptr = "World\n");

write( 1, "World\n" 6);
// write(int fildes, const void *buf, size_t nbyte);
```

2. Truncate a string to four letters.
```
char[] mesg = "Once upon";
mesg[4] = 0;
printf("%d:%s, strlen(mesg), mesg); // 4:Once
```
'\0'

3. Implement strcpy
```
char * strcpy(char * dst, const char * src){
  while(*src){ *dst++ = *src++;}
}
```

4. Implement strdup (create a copy of the string in heap memory)?
```
char * strdup(const char * src){
    char *r = malloc(strlen(src));
    strcpy(r, src);
    return r;
}
```
Your turn:
https://courses.engr.illinois.edu/cs241/
http://www. classtranscribe.com

Navigate to the github wiki -
https://github.com/angrave/SystemProgramming/wiki/

Laptop lab?

HW0 ; bring to your lab tomorrow.

Honors course

> echo $USER
Lawrence_Angrave

> cat "CS241 Learning Objectives.txt".
You will be able to ...

Interact with OS in C via system calls
Understand how OS allocate, deallocates and accesses memory
Understand how virtual memory works
Create, use, manipulate processes and threads
Understand how OS schedules processes and threads
Communicate and synchronize between threads and processes
Determine when deadlock and race conditions may occur and how to avoid them
Manipulate filesystem structures (inodes etc.)
Communicate across networks

> grep "The People" CS241.txt

> man -S 2 " The Experience CS241"

Not your regular course. This is a UIUC-and-by-Angrave course.
A byte of CS241 every day is good for you.
Class: Lecture MWF. Thursday Section. Multiple Choice Quizzes. Midterms.

> Grades

> Why do we need an O/S ?

> Program vs Process
> Process memory

Environment
Program Arguments
Stack
Heap
Unitialized vars
Initialized vars
Code
+ Dynamically linked library functions + Guard pages + Multiple threads.

Process Memory Layout