CS241 #01 Welcome!

0. Learning Objectives:

*Interact with OS in C via* ***system*** *calls*

*Understand how OS allocates, deallocates and accesses memory*

*Understand and use* ***virtual memory***

*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***

1. Why is CS241 hard? Aka “*Look Mom no training wheels!”*

2. What’s the difference between a program image and a process?

*Can we sketch overleaf the contents of the address space of a process?*include Environment, Program Arguments, Stack, Heap, Unitialized vars, Initialized vars, Code

3. Things to get up to speed on before we can talk about threads or system calls in detail

C != C++;

Lifetime of variables;

Arrays;

Buffered I/O;

Pointers- Use of \* and &

C string gotchas;

Heap memory allocation

C library I/O (fprintf,fopen,puts,getchar…) uses low level POSIX calls (read,write,open)

4. Explain what is going on in each line and how many bytes are allocated and where.

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| --- |
| 1. void test() { 2. char\* t1 = "hi"; 3. char t2[] = "ab"; 4. \*t2 = 'A'; 5. \*(t2 + 1) = 'B'; 6. t2[1] = 'B'; 7. \*t1 ='H'; 8. } |

5. Can one process create another process?

6. What is sizeof(int)?

7. What is sizeof(char)?

8. What is sizeof(char\*) ?

9. int A[8]; So what is sizeof(A)?

10. What are malloc, calloc, realloc and free? Why are they hard?

11. A program calls printf("Hello")

when does the C library call write?

12. MPs, lab assignments, Piazza policy. Honors course

13. strtok, strcpy, strcmp, memset, memmove?