Final Exam Logistics
&
Course Review

15-123

Systems Skills in C and Unix

Final Exam

- Scheduled for Tuesday May 3rd, from 5:30-8:30 pm
- Place: McConomy Auditorium, UC
- Please be there on time. We will begin promptly
- Help session on
  - Sunday
  - Place and time TBA

Final Exam points breakdown (roughly)

- UNIX facts– 6 pts
- Shell scripting – 10 pts
- PERL scripting -- 8 pts
- REGEX matters– 10 pts
- Expert C programming – 66 pts

Unix and Shell facts

- What is the purpose of the unix shell?
- What are environment variables?
  - Set of pre-defined/named variables
  - Inherited by forked processes
- Make files
  - Why?
  - dependency graphs
- What is the meaning of each of the components of the command
  - gcc –ansi –Pedantic –Wall –o runme file.c
- No need to memorize the unix manual

Shell Scripting

- Write a shell script that takes a file, where each line is of the form : Guna:10:30:10:70. Find the average score for each record and format the output as: Guna: 30

- Things to look for
  - cat, while, cut , exp

Shell Scripting

- Write a shell script that converts all .txt files in a folder to .html files.

- Things to look for
  - ls, regex match ending with ".txt"
  - mv, $PWD

Perl scripting

- Write a perl script that takes a txt file, open it and find a count for each of the word in the file. Extend the program to handle a folder

- Things to do
  - open, split , hash, (<INFILE>), foreach

Types of quotations

Regex matters

- What is the purpose of the operators
  =~ and =!
- Write an expression to match the following regex's
  - /(a|c|e)a+\d/
  - /[1-4][a-d]+.*@?/

How arrays are stored

Arrays and pointers

- int A[4];   int* B = A;
  - A[i] and *(B+i) equivalent?
- int A[2][3]; int* B = A;
  - A[i][j] and *(*(B+i)+j) equivalent?

Passing arrays into functions

passing a copy or address

- Passing a copy and returning a value

- Why pass the address into the function?

stack vs heap

Where things stored

- Where are these types of variables are stored? heap, stack or neither?
  - local , global , extern , register , pointer , static

Expert C programming

- What can go wrong with the following code?
  - char buf[10];
  - scanf("%s", buf);
- What is the value of x?
  - int x = (1<<32) ;
- What is the difference?
  - typedef int money
  - #define int money

Function pointers

- Why we use them?
- Bubble sort
  - with generic types.
  - using Function pointers

Working with qsort

Bit operations & masking

- Extracting a bit/byte from a 32-bit word

Function macros

Overflow errors

- Limits of data types
  - int, short, long, unsigned, char, float, double
- Operations performed in aligned modes
  - int x = 65535 x 65535
  - x = 4294836225?

Course wrap up