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| CS 241 | Lecture Handout #7  January 29, 2016 |

REMINDER: QUIZ 1 "C" IS AT DCL THIS WEEK. SCHEDULE YOUR 50 MIN SLOT

#1 Code review - how would you improve this code. Highlight every error you notice and then discuss the worst ones

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| 1. // A program to run many commands in parallel 2. // Lines that start with an ! are executed 3. int main(int argc, char\*\* argv) { 4. if(argc!=2) { printf("Usage: %s commandfile\n", argv); exit(1); } 5. size\_t capacity = 200; 6. char\* buffer = malloc(capacity); 7. ssize\_t bytes; 8. FILE \*file = fopen(argv[1],"r"); 9. if(!file) { perror("Could not read file"); return 1;} 10. while( 1 ) { 11. bytes = getline(& buffer, & capacity , file ); 12. buffer[bytes-1] = 0; 13. puts(buffer); 14. if( strcmp(buffer, "END") || bytes == -1) break; 15. if(\*buffer == '!') { 16. if( ! fork() ) { execlp( "bash", buffer +1 , (char\*) NULL); exit(1);} 17. } 18. } 19. return 0; 20. } |

Line number : Comment or suggested fix

#2 What are POSIX signals?

#3 What are the two sources of signals?

#4 What are the most well known signals and what do they do?

SIGINT

SIGSEGV

SIGKILL

Demo.

First let's create an unsuspecting long running process ...

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| 1. // dotwriter.c 2. int main() { 3. printf("My pid is %d\n", getpid() ); 4. int i = 60; 5. while(--i) { 6. write(1, ".",1); 7. sleep(1); 8. } 9. write(1, "Done!",5); 10. return 0; 11. } |

How can I send a signal from another program?

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| 1. int main(int argc, char\*\* argv) { 2. int signal = atoi(argv[1]); 3. pid\_t pid = atoi( argv[2] ); 4. if(signal && pid) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 5. return 0; 6. } |

How can I send a signal from the terminal?

#5 How would you modify the dotwriter program to send itself a SIGINT, after 5 dots?

#6 Alarming signals

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| 1. void main() { 2. char result[20]; 3. puts("You have 4 seconds"); 4. while(1) { 5. puts("Secret backdoor NSA Password?"); 6. char\* rc = fgets( result, sizeof(result) , stdin); 7. if(\*result='#') break; 8. } 9. puts("Congratulations. Connecting to NSA ..."); 10. execlp("ssh", "ssh", "nsa-backdoor.net", (char\*)NULL); 11. perror("Do you not have ssh installed?"); return 1; 12. } |

#7 Stopping and continuing programs

SIGSTOP

SIGCONT

#8 Shell demo Background processes and redirection (>) pipes (|)

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ps

jobs

fg

bg

nohup

wc \*.c > data.txt

#9 Spot the errors part 1

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| 1. // Spot the errors part 1 2. double \*a = malloc( sizeof(double\*) ); 3. double \*b = a; 4. free(b); b = 0; 5. \*a = (double) 0xbaadf00d; 6. char\* result; 7. strcpy(result, "CrashMaybe"); 8. void\* append(char\*\* ptr, const char\*mesg) { 9. if(!\*ptr) ptr = malloc( strlen(mesg) ); 10. strcat( \*ptr, mesg); 11. } |

#10 Spot the errors part 2

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| 1. //Spot the errors part 2 2. char\* f() { 3. char result[16]; 4. strcat( result, "Hi"); 5. int \*a; 6. if( &a != NULL) { printf("Yes %d\n",42); } 7. struct link\* first= malloc(sizeof(struct link\*)); 8. free(first) 9. if(first->next) free(first->next); 10. return result; 11. } |